การพัฒนาเครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภท

นางสาว อุทยา นาคเจริญ

THE DEVELOPMENT OF THAI VIOLENCE RISK SCALE FOR PERSONS WITH SCHIZOPHRENIA

Miss Utaya Nakcharoen

Thesis Title   THE DEVELOPMENT OF THAI VIOLENCE RISK SCALE
                      FOR PERSONS WITH SCHIZOPHRENIA
By   Miss Utaya Nakcharoen
Field of Study   Nursing Science
Thesis Advisor   Associate Professor Jintana Yunibhand, Ph.D., R.N., A.P.N.
Thesis Co-advisor   Associate Professor Waraporn Chaiyawat, D.N.S., R.N., A.P.N.

Accepted by the Faculty of Nursing, Chulalongkorn University in Partial Fulfillment
of the Requirements for the Doctoral Degree

.... Dean of the Faculty of Nursing
(Associate Professor Pol.Capt.Yupin Aungsuroch, Ph.D., R.N.)

THESIS COMMITTEE

.... Chairman
(Professor Somchit Hanucharurnkul, Ph.D., R.N., A.P.N.)

.... Thesis Advisor
(Associate Professor Jintana Yunibhand, Ph.D., R.N., A.P.N.)

.... Thesis Co-advisor
(Associate Professor Waraporn Chaiyawat, D.N.S., R.N., A.P.N.)

.... Examiner
(Assistant Professor Chanokporn Jitpanya, Ph.D., R.N.)

.... Examiner
(Professor Sirichai Kanjanawasee, Ph.D.)

.... External Examiner
(Professor Ronnachai Kongsakon, M.D., M.R.C., Psy., MSc., LLB.)

อุทยา นาคเจริญ : การพัฒนาเครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วย จิตเภท (THE DEVELOPMENT OF THAI VIOLENCE RISK SCALE FOR PERSONS WITH SCHIZOPHRENIA) : อ. ที่ปรึกษาวิทยานิพนธ์หลัก : รศ. ดร. จินตนา ยูนิพันธุ์, อ. ที่ปรึกษา วิทยานิพนธ์ ร่วม: รศ.ดร. วราภรณ์ ชัยวัฒน์, 320 หน้า.

การวิจัยนี้มีวัตถุประสงค์เพื่อพัฒนาเครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงใน ผู้ป่วยจิตเภทที่อาศัยอยู่ในชุมชน โดยอาศัยการทบทวนวรรณกรรมที่เกี่ยวข้องและใช้ทฤษฎี Psychology of Criminal Conduct เป็นแนวทางในการคัดเลือกตัวแปรที่สัมพันธ์กับความเสี่ยงต่อการเกิดพฤติกรรมรุนแรง ในผู้ป่วยจิตเภทที่อาศัยอยู่ในชุมชน การพัฒนาเครื่องมือมีทั้งหมด 10 ขั้นตอน ตามแนวคิดของ Crocker และ Algina (1986)

เครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทที่พัฒนาขึ้น เป็นแบบ สัมภาษณ์ที่ประกอบด้วยข้อคำถามปลายปิด แบบเลือกตอบ ใช่-ไม่ใช่ ทั้งหมดจำนวน 17 ข้อ เครื่องมือนี้ ได้รับการตรวจสอบความตรงเชิงโครงสร้างทั้งแบบการวิเคราะห์องค์ประกอบเชิงสำรวจและการวิเคราะห์ องค์ประกอบเชิงยืนยันอันดับที่สอง โดยการวิเคราะห์องค์ประกอบเชิงสำรวจ (varimax rotation, n = 300) พบว่า เครื่องมือนี้มี 2 องค์ประกอบ คือ คุณลักษณะต่างๆที่สัมพันธ์กับการเกิดพฤติกรรมรุนแรง (15 ข้อ) และ สภาพการณ์ต่างๆที่สัมพันธ์กับการเกิดพฤติกรรมรุนแรง (2 ข้อ) การวิเคราะห์องค์ประกอบเชิงยืนยัน อันดับที่สอง (n = 604) พบว่า ความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงตามโมเดลสมมุติฐานกับข้อมูลเชิง ประจักษ์มีความสอดคล้องกัน สนับสนุนว่าเครื่องมือนี้มีความตรงเชิงโครงสร้าง การตรวจสอบอำนาจการ ทำนายของเครื่องมือโดยการติดตามการเกิดพฤติกรรมรุนแรงจากกลุ่มตัวอย่างจำนวน 128 ราย ในช่วง 2 เดือนต่อมา พบว่า มีค่าความถูกต้อง (AUC) = .88 (p<.001) เมื่อพิจารณาจุดตัดที่คะแนน 23 เครื่องมือนี้มีค่า ความไว = .80 (sensitivity) ค่าความจำเพาะ = .79 (specificity) และ ค่าอำนาจการทำนาย = .64 (positive predictive value) ส่วนผลการตรวจสอบความเที่ยงของเครื่องมือ พบว่า มีค่าสัมประสิทธิ์ความสอดคล้อง ภายในของครอนบาคอยู่ในระดับที่ยอมรับได้ (α = .89)

เครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภท เป็นเครื่องมือที่มีความ ตรงและความเที่ยง มีข้อถามไม่มาก ใช้เวลาในการตอบข้อคำถามประมาณ 5 นาที เครื่องมือนี้จึงเหมาะที่จะ นำไปใช้ในการประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทที่อาศัยอยู่ในชุมชน อย่างไรก็ ดี เนื่องจากเครื่องมือนี้เป็นเครื่องมือที่พัฒนาขึ้นใหม่ จึงควรมีการตรวจสอบและพัฒนาเพิ่มเติม เพื่อให้เป็น เครื่องมือมาตรฐานต่อไป

สาขาวิชา ___พยาบาลศาสตร์___ ลายมือชื่อนิสิต_____
ปีการศึกษา __2553__ ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก_____
ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์ร่วม_____

4977976236 : MAJOR NURSING SCIENCE

KEYWORDS : VIOLENCE/ VIOLENCE RISK/ SCHIZOPHRENIA

UTAYA NAKCHAROEN: THE DEVELOPMENT OF THAI VIOLENCE RISK SCALE FOR PERSONS WITH SCHIZOPHRENIA. THESIS ADVISOR: ASSOC. PROF. JINTANA YUNIBHAND, Ph.D., THESIS CO-ADVISOR: ASSOC.PROF. WARAPORN CHAIYAWAT, D.N.S., 320 pp.

The purpose of this study was to develop an instrument for assessing violence risk among Thai persons with schizophrenia in the community, the Thai violence risk scale (TVRS). The characteristics and circumstances associating with violence among persons with schizophrenia in the community were selected based on literature review and the Psychology of Criminal Conduct theory. Ten steps of scale development procedures by Crocker and Algina (1986) were used.

The TVRS, a 17-item, was an alternate choice, yes-no question for the face-to-face interview instrument. Its construct validity was examined by both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Findings from the EFA (varimax rotation, n = 300) showed that the TVRS was composed of 2 factors. Factor I was the characteristics (15 items) and factor II was the circumstances (2 items). The second order CFA (n = 604) provided the goodness of fit indices illustrating that the violence risk model fitted with the empirical data. These findings supported the construct validity of the TVRS. Predictive validity of the TVRS was studied in 128 persons with schizophrenia in the community. Its AUC was .88 ($p<.001$). With cut-off score of 23, the sensitivity was .80; the specificity was .79; and the positive predictive value was .64. The reliability, internal consistency, of the TVRS was also acceptable. Its Cronbach's alpha coefficient was .89.

With enough evidence to support its psychometric properties and it takes only 5 minutes to complete the TVRS, this instrument is suitable for assessing violence risk in persons with schizophrenia in the community. However, the TVRS is a newly development instrument, it requires further study to make it a standard instrument.

Field of Study : __Nursing Science__   Student's Signature _Utaya Nakcharoen_

Academic Year : __2010__   Advisor's Signature _Jintana Yunibhand_

Co-advisor's Signature _Waraporn Chaiyawat_

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CHAPTER I

INTRODUCTION

Background and significance of the study

Recently, despite differences among countries with respect to mental health legislation and institutionalization, the data show that, in community settings, persons with schizophrenia have a clear association with increased violence over inpatients and the general population (Hodgins, 1992; Nordstrom, Kullgren, and Dahlgren, 2006; Stompe et al., 2006; Tengstrom and Hodgins, 2002). The great majority of individuals with schizophrenia do not pose a risk of violence; however, a minority commits violence (Lindqvist and Allebeck, 1990b; Eronen, Hakola and Tiihonen, 1996a; Eronen, Tiihonen and Hakola, 1996b) and other types of illegal acts and become involved in the criminal justice system (Hodgins et al., 1996).

A number of studies have reported that persons with schizophrenia have a four to six times higher risk of committing a violent crime as compared to the general population (Angermeyer, 2000; Brennan, Mednick, and Hodgins, 2000; Eronen, Angermeyer, and Schulze, 1998). The odds ratio jumps from 2.4 for those individuals with schizophrenia without substance abuse to 18.8 for schizophrenia complicated by substance abuse (Angermeyer, 2000). In Thailand, the prevalence of violence in persons with mental illness (schizophrenic patients=72.8%, MR=10.5%, others=16.7%) ranges from two to four times during 2 months to 5 years after first committing the violence (Ranee Chayintu and Nongluck Sattra, 2000).

Some Thai persons with schizophrenia in the community are violent to themselves and to others. Consequently, the victims are found to have suffered physical injury, or psychological distress and emotional trauma, or both. In extreme cases, the incidents have resulted in the death of family members or other persons. Persons with schizophrenia are likely to be rejected by their community, stigmatized, and often a key criterion for admission and readmission (Chaisurin, 2007) as in many countries (Hirayasu, 2000; Paterson, Claughan, and McComish, 2004; Rocca, Villari, and Bogetto, 2006). Moreover, violence can also result in financial loss, loss of freedom, and even loss of life. Imprisonment or becoming an inpatient can result in job loss, divorce, and poverty, which can motivate patients toward even further violence to gain resources. It is important that the prevention of future violence among persons with schizophrenia in the community. Thus, mental health nurses should pay more attention to the violence risk that can prevent violence before it begins.

In this study, violence risk refers to the probability estimates of a person intentionally using physical force, threats or actual, against another person, himself or herself, or a group of people that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation. The estimates are determined by considering the existing characteristics of the person and their circumstances that associated with violence.

Research on violence among persons with schizophrenia has suggested several characteristics and circumstances as being associated with and predictive of violence among persons with schizophrenia (Abu-Akel and Abushua'leh, 2004; Ran et al., 2010; Swanson et al., 2006; Vevera et al., 2005; Walsh et al., 2004). Regarding

psychotic symptoms, in approximately 45% of cases (Humphreys et al., 1992), the psychotic symptoms *per se* are judged to have directly elicited violent drives (Junginger, 1996). Moreover, a number of studies of schizophrenic patients have shown that before violence, psychotic symptoms such as delusions, hallucinations, excitement, etc. are specific primary characteristics that increase violence (Fullam and Dolan, 2008; Joyal et al., 2004; Laajasalo and Hakkanen, 2006; Swanson et al., 2006). Especially, if the patients are also non-compliant in taking medication, have a history of previous violence, are of the male gender, are poor family relationships, have personality disorders, and substance use, etc. that are more likely to increase the risk of committing violence over other psychiatric patients in the community (Brennan et al., 2000; Colasanti et al., 2008; Walsh, Buchanan and Fahy, 2002).

Recently, although there are many ways to prevent violence among persons with schizophrenia, such as drug treatment and violent management programs, primary violence prevention is violence risk assessment (Hart, 1998). Early identifying of high violence risk patients, violence risk assessment can be useful in the primary effective prevention of future violence (Hart, 1998; Moran et al., 2001). Thus, the first step in violence prevention is to create an accurate violence risk assessment scale (Erkiran et al., 2006). So, evaluating the characteristics and circumstances related to violence would be helpful in assessing violence risk among persons with schizophrenia in the community. Mullen (1997) believes that the possibility of violence should be considered in much the same way that suicide risk is routinely considered. Therefore, persons with schizophrenia in the community ought to be assessed routinely for violence risk.

In Thailand, although mental health nurses try to decrease and manage violence among persons with schizophrenia in the community, the patients are at risk of committing violence later on because they not only have little power to detect or intervene until these acts are committed, but also lack adequate or appropriate violence risk assessment approach. The most common approach used is the clinical approach that is unstructured clinical judgment. This has the advantage of being flexible, allowing a focus on case-specific influences and violence prevention (Hart 1998). However, the clinical approach has been criticized for being unstructured, informal, subjective, and impressionistic (Grove and Meehl, 1996). Moreover, Hart (1998) has also highlighted several weaknesses of unstructured clinical judgment. These include the idea that there tends to be a lack of consistency or agreement across assessors with low inter-rater reliability, and assessors may fail to specify why or how they reach a decision, making it difficult for others to question that decision. Thus, the problem of improving the methods of assessment and preventing violence is enormous (Stone, 2002), partly because of the rarity of an appropriate violence risk assessment scale.

From a review of the literature, it can be seen that the technology used to assess and predict risk of violence has evolved, producing a number of violence risk assessment scales, such as the Violence Risk Appraisal Guide (VRAG; Quinsey et al., 1998 cited in Andrews and Bonta, 2006), the Violence Screening Checklist (VSC; McNiel, Binder, and Greenfield, 1988), the Psychopathy Checklist-Revised (PCL-R; Hare, 1991), the Psychopathy Checklist: Screening Version (PCL:SV; Hart et al., 1995), the Level of Service Inventory-Revised (LSI-R; Andrews and Bonta, 1995), and Historical, Clinical and Risk Management-20 Item version 2 (HCR-20; Webster

et al., 1997 cited in Andrews and Bonta, 2006). However, all of these scales were developed based on risk factors for criminality of general offenders. Moreover, these existing instruments take time for use as a screener in a setting such as the community, outpatient departments, or justice systems where there is limited time or limited staff resources. That is, these existing instruments involve time-consuming procedures on a careful file review and a semi-structured interview (Arango et al., 1999; Kho et al., 1998). In addition, these scales represent violence risk assessment for a conditional discharge from hospital or prison.

According to Douglas and Skeem (2005) have suggested that the next greatest challenge is to develop sound methods for assessing changeable aspects of violence risk. In a similar vein, Andrews and Bonta (2006) have proposed the idea that regarding the development of a specialized risk scale for assessment of risk for violence, persons that commit violence are significantly different enough from others that we need a different set of characteristics and circumstances for violence. Thus, new violence risk assessment scales aim to fulfill specialized functions, such as the assessment and management of violence, especially regarding the treatment of violence and are theoretically-based. That is, specialized scales are more appropriate for special need populations (Wong and Gordon, 2006).

The Violence Risk Scale (VRS; Wong and Gordon, 2006) was designed based on the Psychology of Criminal Conduct (PCC; Andrews and Bonta, 2006) theory and literature review. The results of the VRS assessment can inform service providers about whom to treat, what to treat, and how to treat (Wong and Gordon, 2006). It also demonstrates good validity and reliability (Lewis and Wong, 2008; Wong and Gordon, 2006). However, although the VRS can assess violence risk

among psychiatric patients, some items of the VRS related to criminality which is not characteristics or circumstances regarding the violence among persons with schizophrenia in the community. Moreover, item D11 (mental disorder) is too broad and this characteristics are not specific enough for assessing violence risk among persons with schizophrenia in the community. In addition, the VRS is limited to covering the entire description of the various characteristics and circumstances of the schizophrenic patients.

As a result, directly using the VRS or other violence risk assessment scales as described above with Thai persons with schizophrenia in the community may be problematic because they were not developed to assess specific types of characteristics and circumstances for violence among persons with schizophrenia in the community. Additionally, the differences between schizophrenic patients and offenders may affect the reliability and validity of these scales when used with Thai persons with schizophrenia in the community. At present, violence risk assessment has become increasingly important in mental health nursing, as mental health nurses work with patients that have a high probability of displaying violent behavior. However, as an emerging practice, there violence risk assessment scales have not been developed specifically for persons with schizophrenia in the community.

In order to overcome this obstacle, if mental health nurses, who play a pivotal role in violence prevention, have an accurate violence risk assessment scale designed specifically to assess violence risk which focuses on the characteristics and circumstances that are associated with violence potential. This would help mental health nurses deal with violence among Thai persons with schizophrenia in the community. Thus, mental health nurses need a reliable and valid instrument to

appropriately assess violence risk, and they need to use it appropriately in order to identify which persons with schizophrenia in the community are at high violence risk.

Therefore, the present study will develop a violence risk assessment scale for Thai persons with schizophrenia in the community, the Thai Violence Risk Scale (TVRS), based on the literature review, and will use the Psychology of Criminal Conduct (PCC; Andrews and Bonta, 2006) theory as a guide to select the significant characteristics and circumstances that are associated with violence among persons with schizophrenia. Thus, the purpose of this study is to develop a psychometrically-sound measure for assessing violence risk among Thai persons with schizophrenia in the community.

The outcome of this study on the Thai Violence Risk Scale (TVRS), represents new knowledge that will provide an alternative way for assessing violence risk through the characteristics and circumstances that are associated with violence; this is different from prior perspectives. The TVRS can be used as a scale to develop future knowledge in nursing science both in research and in clinical practice. In research, the scale can be used as an instrument for assessing the effectiveness of an intervention-based program for preventing and reducing violence among persons with schizophrenia in the community. In clinical practice, the TVRS can be used as a screening tool to assess and identify violence risk among persons with schizophrenia in the community.

Research questions

1. What is an instrument which aimed to assess violence risk among Thai persons with schizophrenia in the community?

2. What are the psychometric properties of an instrument that aimed to assess violence risk among Thai persons with schizophrenia in the community?

Objective of the study

1. To develop an instrument for assessing violence risk among Thai persons with schizophrenia in the community.

2. To test the psychometric properties of the instrument for assessing violence risk among Thai persons with schizophrenia in the community in term of validity and reliability.

Scope of the study

This study, the development of an assessment scale, will establish a reliable and valid instrument for assessing violence risk among Thai persons with schizophrenia in the community. The Thai Violence Risk Scale (TVRS) was developed base on a review of the literature and used the Psychology of Criminal Conduct (PCC; Andrews and Bonta, 2006) guided to select the characteristics and circumstances related to violence. The target population is Thai persons with schizophrenia in the community. The setting for this study was the outpatient

department of psychiatric hospitals, the Mental Health Department, Ministry of Public Health, in four regions of Thailand. These include the north (Suan Prung Psychiatric Hospital), the northeast (Prasrimahabhodi Psychiatric Hospital), the central region (Galya Rajanagarindra Institute), and the southern region (Suansaranrom Hospital).

Conceptual framework

Violence risk is the concept of this study. Violence risk is the probability estimates of a person intentionally using physical force, threats or actual, against another person, himself or herself, or a group of people that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation. The estimates are determined by considering the existing characteristics of the person and their circumstances that associated with violence, as described in the chapter I. Thus, the violence risk composed of characteristics and circumstances components.

From the literature, there are various the characteristics and the circumstances that associated with violence among persons with schizophrenia in the community. This study, so, used the Psychology of Criminal Conduct (PCC; Andrews and Bonta, 2006) guided to select the significant characteristics and circumstances identified through research as being associated with violence among persons with schizophrenia in the community.

In this study, therefore, characteristics include younger age, male gender, antisocial personality disorder, educational failure, living alone, younger age at first hospitalization with schizophrenia, history of substance use, limited or no vocational

activity, history of violence, history of abuse, aggressive behavior, delusions, hallucinations, excitement, suspiciousness, hostility, lack of insight, symptoms of mania, depressive symptoms, threat/control override symptom, uncoorperativeness, disorientation, medication noncompliance, substance abuse, homeless, and weapon availability; and circumstances include poor peer relationships, poor family relationships, and expressed emotions in family.

The reason for selecting only 26 characteristics and 3 circumstances that associated with violence among persons with schizophrenia in the community because these characteristics and circumstances provide a concrete way to assess violence risk. Moreover, these characteristics and circumstances are commonly available in persons with schizophrenia or are easily to assess routinely among persons with schizophrenia in the community. The conceptual framework for this study show as follows:
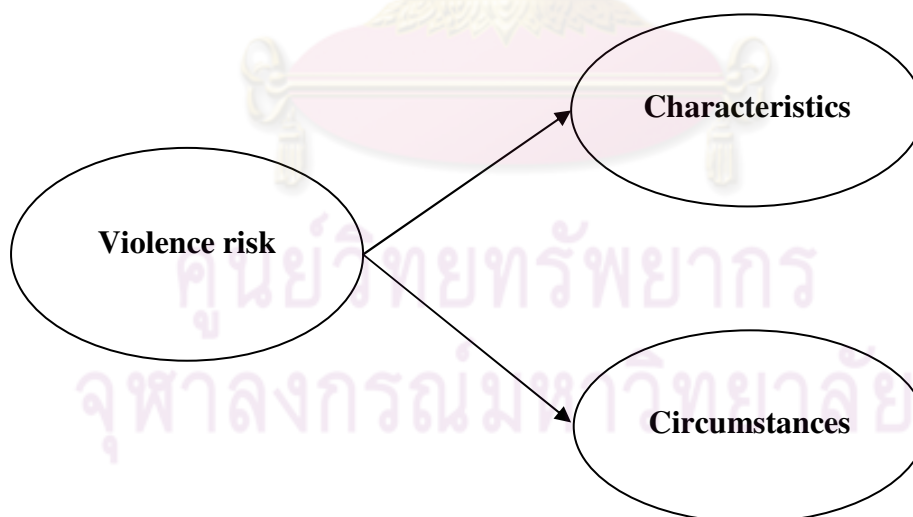
Figure 1 Conceptual framework of the study

Operational definitions

Violence risk refers to the probability estimates of Thai persons with schizophrenia in the community intentionally using physical force, threats or actual, against another person, himself or herself, or a group of people that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation. The estimates are determined by the characteristics of persons with schizophrenia and their circumstances that are associated with violence.

1. Characteristics refer to personality or features or attribute, background, social status, and conditions of Thai persons with schizophrenia in the community associated with intentionally using physical force, threats or actual, against another person, himself or herself, or a group of people that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation. These characteristics include younger age, male gender, antisocial personality disorder, educational failure, living alone, younger age at first hospitalization with schizophrenia, history of substance use, limited or no vocational activity, history of violence, history of abuse, aggressive behavior, delusions, hallucinations, excitement, suspiciousness, hostility, lack of insight, symptoms of mania, depressive symptoms, threat/control override symptom, uncoorperativeness, disorientation, medication noncompliance, substance abuse, homeless, and weapon availability.

2. Circumstances refer to events or situations of Thai persons with schizophrenia in community life associated with intentionally using physical force,

threats or actual, against another person, himself or herself, or a group of people that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation. These circumstances include poor peer relationships, poor family relationships, and expressed emotions in family.

Expected benefits

1. The Thai Violence Risk Scale (TVRS) could be a new scale that provides an alternative way of assessing risk of violence.

2. The Thai Violence Risk Scale (TVRS) could be used as a screening tool to develop future knowledge in nursing science both in research and clinical practice.

3. This results will enhance the quality of care in nursing science for the prevention of violence among persons with schizophrenia in the community.

CHAPTER II

LITERATURE REVIEWS

In reviewing the literature from this study is to point out the importance towards developing that the Thai Violence Risk Scale needs. Thus, existing knowledge about violence among persons with schizophrenia and violence risk assessment were done by researching both Western and Thai data bases that published between 1990 and 2011. A broad search strategy for potential articles was used in order to include all relevant studies. Electronic searches of Medline, CINAHL, EBSCO, ProQuest, SCIENCE DIRECT, Sage, Google, and Thailis; using key words: violence, violent behavior, violence risk, violence risk assessment, aggression, aggressive behavior, and schizophrenia. This is a synthesis and critique of published studies that focused specifically on characteristics and circumstances associated with violence among persons with schizophrenia. This includes literature examining relationships and predictions between violence and the independent variables representing characteristics and circumstances for violence among persons with schizophrenia. In Thailand, however, there had few studies related to violence in persons with schizophrenia. There are few qualitative and descriptive studies.

All aspects and facts about violence among Thai persons with schizophrenia in the community and how to develop violence risk assessment scale were discussed on the topic of violence and violence risk among persons with schizophrenia in the community, violence risk assessment scales, and scale development as the followings:

1. Theory of violence and violence risk

1.1 Theory of violence

1.2 Definition of Violence risk

2. Violence risk among persons with schizophrenia in the community

    2.1 Persons with schizophrenia

    2.2 Violence among persons with schizophrenia in the community

    2.3 Violence and violence risk among persons with schizophrenia in the community

    2.4 The Psychology of Criminal Conduct (PCC)

    2.5 Characteristics and circumstances related to violence guide by the PCC theory

3. Nursing practice in persons with schizophrenia in the community

    3.1 Nurse and nursing intervention for persons with schizophrenia in the community

    3.2 Violence risk assessment among persons with schizophrenia in the community

4. Violence risk assessment scale

    4.1 Generation of violence risk assessment scales

    4.2 Violence risk assessment scales

5. Scale development

1. Theory of violence and violence risk

1.1 Theory of violence

The word violence derives from the Latin root, vio, referring to force. It generally refers to physical force but is mostly applied to human action (Barash, 2001 cited in Muro-Ruiz, 2002).

Definitions of violence differ depending on theoretical and discipline oriented. In general, violence is define as physical assault, dangerousness generally denotes threat, latent harm and potential for action whereas recidivism is repeated re-offending (Kettles, 2004). It has also been defined by Petties (2002) as actual, attempted, or intended harm to people, clear threats of violence, acts or threats that are likely to cause harm or induce fear in the average person, and acts or threats that could lead to criminal or civil sanctions, while Friedman (2006) defined violence as having used a weapon such as a knife or gun in a fight and having become involved, with a person other than a partner or spouse, in more than one fight that came to blows behavior that is likely to frighten most people. Moreover, World Health Organization (1995) defined violence as the intentional use of physical force or power, threatened or actual, against another person or against oneself or a group of people that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation.

In psychiatric outpatient, defined violence as battery that resulted in physical injury (ranging from bruises to death), sexual assaults, assaultive acts that involved the use of a weapon, or threats made with a weapon in hand (Hiday, 2006; Petties, 2002; Skeem et al., 2005). Similarly, Monahan (2001) defined violence as:

any acts that include battery resulted in physical injury, sexual assaults, or assaultive acts that involved the use of a weapon, or threats made with a weapon in hand. The violence variable reflects whether a patient committed any of these act(s) of violence in the community during the entire follow-up period (i.e., 1 year after hospital discharge) (Skeem et al., 2005). In psychiatric inpatients, moreover, violence was defined as any incident in which a patient attempted to physically harm others, such as hospital staff members, other patients, or visitors, or attempted to damage property (El-Din Soliman, and Reza, 2001).

In summary, violence is defined as actual, attempted, or intended of any physical force so as to injure, abuse, or threatened that involved the use of a weapon, or threats made with a weapon in hand to another person resulting in physical injury, death, psychological harm, maldevelopment or deprivation.

In this study, used violence which defined by World Health Organization (1995). Because the inclusion of the word 'power' in addition to the phrase 'use of physical force,' broadens the nature of a violent act and expands the conventional understanding of violence to include those acts that result from a power relationship, including threats and intimidation. The 'use of power' also serves to include neglect or acts of omission, in addition to the more obvious violent acts of commission. This definition covers a broad range of outcomes including psychological harm, deprivation and maldevelopment (Krauss, 2006). Moreover, WHO's typology of violence (Krug et al., 2002) is rational and categorical rather than empirical. It divides violence into three major categories: self-directed, interpersonal, and collective based upon the circumstances in which the violent act took place. Each of these categories is further subdivided. The focus of self-directed violence is self-

evident. It has two subcategories: suicidal behavior and self-abuse (e.g., self-mutilation). Interpersonal violence inflicted by another individual or a small group of individuals. Such violence is further divided into family, intimate partner, and community violence. Collective violence is "the instrumental use of violence by people who identify themselves as members of a group against another group or a set of individuals, in order to achieve political, economic, or social objectives" (Krug et al., 2002: 5).

In relation of violence and criminality, violence and criminality or criminal behavior in patients with schizophrenia has been described in several studies (Brennan et al., 2000; Hodgins et al., 1996; Mullen et al., 2000; Swanson et al., 2000). According to Andrew and Bonta (1998 cited in Andrews and Bonta, 2006), they suggest four broad definitions of criminal behavior. These four areas are *legal criminal behavior or actions* that are prohibited by the state and punishable under the law, *moral criminal behavior* which refers to actions that violate the norms of religion and morality and are believed to be punishable by a supreme spiritual being, *social criminal behavior* which refers to actions that violate the norms of custom and tradition and are punishable by a community and finally *psychological criminal behavior* that refers to actions that may be rewarding to the actor but inflict pain or loss on others - it is criminal behavior that is anti-social behavior. Moreover, Sutherl and Cressey (1999) defined criminality is behavior in violation of the criminal law. No matter what the degree of immorality, reprehensibility, or indecency of an act, it is not a crime unless it is prohibited by the criminal law. In addition, criminality was defined as violent offenses that are murder, manslaughter, assault, arson, threat of violence or harassment, sexual offence, robbery, forcible confinement, and illegal

procession of firearms or explosives (Eriksson, 2008). So, violence is behavior or action in the part of criminality.

1.2 Definition of violence risk

1.2.1 Risk

Originally, the concept risk was used primarily to mean loss or hazard to the person or self. In 1719, the concept took on an expanded definition to include the commercial loss of insured property or goods. In 1789, the concept was used in the law literature to describe the liability of such loss or damage. Moreover, other variations and combinations began to be used in business and commerce such as risk aversion, risk bearing, risk capital, risk management, risk rate, and risk factor (Shattell, 2004).

Dempster (2003) identified components of risk include the *nature* of the event (the manner in which the person will be violent, e.g., sexual violence versus spousal violence), *severity* of the event (ranging from no or minor physical injury to multiple deaths), *imminence* (the time frame in which the person will be violent, e.g., imminent violence versus violence ten years after release), *frequency* (how often will this person be violent, e.g., isolated acts of violence versus chronic, persistent violence), and *context* (the circumstances and victim or victims). These components of risk are gradually being incorporated into research and clinical practice of violence risk assessment. For instance, the development of specialized instruments for spousal assault (e.g., Spousal Assault Risk Assessment Guide, Kropp et al., 1998) and sexual offending (e.g., Rapid Risk Assessment for Sex Offense Recidivism, Hanson, 1997) have increased our understanding of the nature of risk. As

well, the use of survival analyses has incorporated the notion of imminence into violence risk studies (Kettles, 2004).

In a concept analysis of risk, Shattell (2004) reviewed the literature in nursing, sociology, psychology, philosophy, ethics, business and industry, art and architecture, education, linguistics, statistics, economics, religion, and popular media found the concept risk widely used but rarely defined. Thus, Shattell provided the following uses of the concept risk: 1) A danger to self or the potential for physical or emotional harm, injury, or loss: for example, at-risk, risk factor, and high risk. 2) Decision making, a way of being about decision making, or uncertainty: for example, risk averter, risk taker, risk assessment, risk adjustment, and risk management. 3) Danger to property. 4) Recuperating for loss in property or finances. 5) Insuring people and property. 6) Forecasting financial loss or the possibility of financial loss, including a measurement tool or strategy: for example, risk management, risk capital, risk money, and risk factor. 7) Financial gain related to perceived high risk: for example, risk premium. 8) Copyrighted material: for example, a board game risk and computer software for the insurance industry.

At this time, risk is a widely used concept in health-related research. There is, however, great ambiguity in the theoretical definition of the term. There are many definitions of risk that vary by specific application and situational context as follows:

According to Adams (1995 cited in Kettles, 2004) defined risk as 'the probability of an adverse future event multiplied by its magnitude' (p. 69), illustrated that while risk is easy to define, it entails difficult characteristics. Moreover, it is used as risk factors for criminal behavior or violence behavior.

Pins (1996) defined risk as the probability of a bad consequence or as the likelihood that a particular adverse event will occur.

Carson (1997) definition of risk involves consideration of both possible harm and possible benefits. Risk is dynamic, that is, it changes across time and across situations.

Hart (2000 cited in Dempster, 2003) defined risk as a hazard that can be predicted with uncertainty.

Jaeger and collegues (2001 cited in Hampel, 2006) defined risk as a situation or event in which something of human value (including humans themselves) has been put at stake and where the outcome is uncertain.

Kettles (2004) defines risk as the probability that an event will occur. It encompasses a variety of measures of the probability of a generally unfavorable outcome.

Shattell (2004) defined risk as a chance or potentiality for loss or harm, a cognitive recognition involving thought and perception about self and/or others, and a decision-making process based on probability or a weighing of the possibilities or potentialities. In risk concept analysis, moreover, she defined attributes of the concept risk are as 1) a chance or potentiality of loss or harm, 2) a cognitive recognition involving thought and perception about self and/or others, and 3) decision-making process based on probabilities or a weighing of the possibilities or potentialities.

Medical dictionary (2010) defines risk as:

1. The possibility of suffering a harmful event.

2. A factor or course involving uncertain danger, as with smoking or exposure to radiation.

3. The possible peril related to a particular condition or treatment. The risk may come directly from the condition itself or indirectly from the process or method involved in the treatment application.

4. The chance of an unfavorable event occurring.

5. The chance or likelihood that an undesirable event or effect will occur, as a result of use or nonuse, incidence, or influence of a chemical, physical, or biologic agent, especially during a stated period; the probability of developing a given disease over a specified time period.

6. The chance or possibility of loss.

In summary, most of the authors defined risk as a chance or possibility or probability or likelihood of adverse event will occur multiplied by its magnitude that is the nature of the event of risk. Moreover, the authors defined risk as outcomes such as danger, loss, or injury that is the severity of the event of risk. In addition, risk is sometime used to refer to as risk factor that is context (circumstances) of risk. More often, it is used as a combination of both probability and outcome. This study use risk as probability of adverse event will occur.

1.2.2 Violence risk

As described above, violence is defined as actual, attempted, or intended of any physical force so as to injure, abuse, or threatened that involved the use of a weapon, or threats made with a weapon in hand to another person whereas risk defined as a chance or possibility or probability or likelihood of adverse event will occur multiplied by its magnitude.

According to Kumar and Simpson (2005) studied application of risk assessment for violence methods to general adult psychiatry: a selective literature review, defined violence risk as the probability that a person may commit a violent act against another person in the future, in certain circumstances.

Ferris and others (1997) defined violence risk as probability estimates of the chances for violence to occur, emerged as a promising alternative to the less fruitful attempts to predict dangerousness, which implies certainty. The estimates are derived by considering "risk factor," which are variables identified through research as being associated with violence, to determine the likelihood of "harm," which is the amount and type of violence being predicted.

Thus, this study defined violence risk as probability estimates that a person will intentionally using physical force, threats or actual, against another person, himself or herself, or a group of people that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation. The estimates are determined by considering the existing of characteristics of person and their circumstances that associated with violence. Similarly, Andrews and Bonta (2006: 47) defined risk factors as characteristics of people and their circumstances that associated with an increased chance of future criminal activity. That is, a higher violence risk person will have more number of characteristics and circumstances for violence than a low violence risk person.

2. Violence risk among persons with schizophrenia in the community

2.1 Persons with schizophrenia

Schizophrenia by definition is a disturbance that must last for 6 months or longer, including at least 1 month of delusions, hallucinations, disorganized speech, grossly disorganized or catatonic behavior, or negative symptoms (Stahl, 2010).

Schizophrenia is a common, severe, debilitating mental illness that affects about 1% of the population worldwide (Pinikahana et al., 2002; Sadock and Sadock, 2003). There are 15 new cases of schizophrenia per 100,000 population per year (Kelly, 2005). They are ranked fourth to sixth among the causes of disability worldwide, they manifest early adult life, and their prognosis is often poor (Kylma et al., 2006).

In Thailand the number of persons diagnosed with schizophrenia is increasing. Once thought to be due to psychological factors, schizophrenia is now recognized to be a disorder of brain structure and function (Carpenter and Buchanan, 1994) caused by a combination of incompletely characterized genetic and environmental factors.

Symptoms of schizophrenia are classified in four domains: positive symptoms, negative symptoms, cognitive symptoms and affective symptoms. Positive symptoms are hallucinations, delusions and thought disorder. Negative symptoms include social withdrawal, lack of motivation, spare speech and emotional indifference. These negative symptoms are often quite debilitating and impede rehabilitation, even when positive symptoms are in remission. Cognitive symptoms include poor attention and decreased short-term memory. Long-term memory is not

impaired. These cognitive difficulties clearly impede progress in rehabilitation, vocational advancement and educational achievement. Affective disturbances are primary related to discouragement and demoralization (Bloom and Wilson 2000).

Schizophrenia involves impairment in many domains, often over and above the direct effect of positive psychotic features. Thus, one can describe a variety of disabilities that may affect someone with the disorder. Primary disabilities: positive and negative psychotic features, depression and other psychopathology, drug side-effects, and cognitive dysfunction. Secondary disabilities: loss of social capital, education, family, friends, occupational opportunity, and independence and esteem. Tertiary disabilities: results of stigma, loss of opportunities, and discrimination. Impairments arise as a result of primary and, to some extent, tertiary disabilities. Some people may require supervision to ensure adequate nutrition and hygiene standards, and to protect the person from the consequences of impulsivity, poor judgment, cognitive impairment, or acting in response to delusional beliefs or command hallucinations (Jones and Buckley, 2006; 15-16) that related to violence.

2.2 Violence among persons with schizophrenia in the community

From the literature review found that majority of persons with schizophrenia in the community tend to be more violent than patients in other diagnoses (Fazel and Grann, 2006; Logdberg, Nilsson, and Levander, 2004; Munkner et al., 2005; Tuninger et al., 2001). The Epidemiological Catchment Area (ECA) surveys carried out in 1980-1983 reported much higher rates of violence among persons with schizophrenia living in the community compared to other community residents were 21 times more likely to have used a weapon in a fight (Swanson et al.,

1990). Wessely and others (1994) found that a study of 538 persons with schizophrenia living in London reported that the men had a 3.9 times and women 5.3 times greater risk for conviction for assault and serious violence compared to a control group with other psychiatric diagnoses. Lindqvist and Allebeck (1990) followed up 644 persons, with a diagnosis of schizophrenia discharged from hospital in Stockholm in 1971, over a 15-year period. They found that the rate of recorded convictions for violent offences was four times higher in the group than the general population average. Wallace and others (1998), in a study of individuals convicted of serious offences in Victoria County, Australia, searched for evidence of a psychiatric contact on the county psychiatric register. Those with schizophrenia were found to be over four times more likely to be convicted of interpersonal violence and ten times more likely to be convicted of homicide than the general population. Birth cohort studies have also found an association between schizophrenia and criminal acts. The Northen Finnish Birth Cohort Study (n=12,058), which controlled for socio-economic status, found that persons with schizophrenia were three times more likely to be convicted of a crime and seven times more likely to be convicted of a violent crime (Tiihonen et al., 1997).

In Thailand, there have been few studies related to violence in persons with psychosis. Prapat Ukranan and Veeradech Veerapongset (1998) studied about psychotic patient and violent crime. The findings found that 78.8% of persons with a diagnosis of schizophrenia, 14.5% for other psychosis, and 6.7% for other non-organic psychosis. Ranee Chayintu and Nongluck Sattra (2000) studied in the first offending and re-offending among forensic psychiatric patients and their correlates. The finding found that most of patients with psychosis (72.8%). The reoffending rate

was 40.2% in 6 months and 22.4% in 7-12 months. Thus, the results of prior study showed that persons with schizophrenia in the community were associated with violence.

2.3 Violence and violence risk among persons with schizophrenia in the community

Nowadays, public perception of the association between mental illness and violence is central to the stigma and discrimination aimed at patients, especially in schizophrenic patients. The persons with schizophrenia that are associated with increased rates of violent behavior are significantly more likely to be violent than members of the general population (Walsh et al., 2002).

Mental health services have a responsibility to reduce such violence for the sake of their patients as well as the wider community. Most of the violence among those with schizophrenia is perpetrated by members of relatively small subgroups, who probably constitute no more than 10–15% of the patient population. These high-risk subgroups are recognizable in advance. Importantly, however, only a few even in these groups will ever commit serious acts of violence (Mullen, 2006). Violence by persons with schizophrenia in high-risk groups is mediated not just by active symptoms but also by the characteristics and circumstances that are associated with violence.

The prevention of future violence requires approaches that target these characteristics and circumstances regarding violence among persons with schizophrenia. Thus, a patient is more likely to act violently they should receive better services is equally problematic. However, for the mental health nurses that face up to

the fact that reducing violence is part of the legitimate aims of their services, the issue becomes a matter of adequate levels of care and treatment for the particular problems, not better or worse services for any particular individual.

Therefore, the assessment of the risk of violence is of great interest to mental health nurses that are trying to identify the characteristics and circumstances which may increase or decrease the risk of violent behavior among persons with schizophrenia, which in turn may provide some clues as to how to intervene best in order to reduce the violence among persons with schizophrenia in the community.

2.4 The Psychology of Criminal Conduct (PCC)

As described above, violence risk estimated by considering the existing of characteristics of people and their circumstances that associated with violence. In this study, thus, used the PCC guided to select significant characteristics and circumstances which identified through research as being associated with violence among persons with schizophrenia in the community.

The Psychology of Criminal Conduct (PCC, Andrews and Bonta, 2006) theory has recently been first introduced in criminal behavior literature. The PCC, was advanced by Andrews and Bonta in 1994, 1998, 2003, and 2006, is an approach to understanding the criminal behavior of individuals through: a) the ethical and humane application of systematic empirical methods of investigation, and b) the construction of rational exploratory systems (Andrews and Bonta, 2006: 19). The objective of the PCC is to understand variation in the delinquent and criminal behavior of individuals (Andrews and Bonta, 2006: 28). The PCC is based on a

combination of social learning, psychopathological, and sociological theories and derivation of the principles of risk, need, strengths, and responsivity.

Risk, risk factors refer to characteristics of people and their circumstances that are associated with an increased chance of future criminal activity. The clinical (or practical) applications of knowledge of risk factors are many. In correctional agencies and facilities and in forensic mental health settings, issues of risk of reoffending are crucial to decisions of early release. Generally, lower-risk cases are candidates for early release and low levels of supervision while higher risk cases are candidates for higher levels of supervision. Moreover, risk is also a major factor in the allocation of treatment services, more intensive services are best allocated to the higher-risk cases while low-risk cases have a low probability of recidivism even in the absence of treatment services (Andrews and Bonta, 2006: 47). There are two aspects to the risk principle. The first is that criminal behavior can be predicted. The second aspect of risk principle involves the idea of matching levels of treatment services to the risk level of the offender. This matching of service to offender risk is the essence of the risk principle and is the bridge between assessment and effective treatment. Higher-risk offenders need more intensive and extensive services if we are to hope for a significant reduction in recidivism. For the low-risk offender, minimal or even no intervention is sufficient (Andrews and Bonta, 2006: 279).

Need, it has been traditional in corrections to identify problematic circumstances as "need." It would be valuable to differentiate between criminogenic needs and noncriminogenic needs. Criminogenic needs are dynamic risk factors, risk factors that can be change. With change, we see changes in the chances of criminal

activity. Changes in noncriminogenic needs are not followed by changes in the chances of criminal activity. Thus, the destination "dynamic risk factor" (or criminogenic need) suggests possible intermediate targets of change for treatment services when an objective is reduced reoffending (Andrews and Bonta, 2006: 48). Dynamic risk factors are ones on which assessed change is associated with subsequent criminal behavior. Some dynamic risk factors are relatively stable in that change occurs over a matter of weeks, months, or even years. Some dynamic risk factors are much less stable and may change almost instantaneously. These fast-changing dynamic risk factors are often called acute dynamic risk factors and typically reflect immediate situations or immediate circumstances and/or immediate emotional states. The discovery of dynamic risk factors confirms that risk levels are subject to change and that these dynamic predictors may serve as treatment goals (Andrews and Bonta, 2006: 55). Thus, reassessments over a period much shorter than six months or more (e.g., monthly, weekly, or even daily) may lead to the discovery of acute dynamic risk factors that will predict criminal occurrences over the very short term (Andrews and Bonta, 2006: 56).

Strength, strength factors are sometimes called protective factors. Generally, strengths refer to characteristics of people and their circumstances that are associated with reduced chances of criminal activity. When strengths are assessed with validity, they may increase the predictive accuracy that is achieved by an assessment of risk factors. Moreover, consideration of strengths allows for a more positive and complete picture of people than does simply a focus on risk (Andrews and Bonta, 2006: 48).

Responsivity, the responsivity principle refers to delivering treatment programs in a style and mode that is consistent with the ability and learning style of the offender. The general responsivity principle is quite straightforward: offenders are human beings, and most powerful influence strategies available are cognitive-behavioral strategies. Hence we should use social learning and cognitive-behavioral styles of service to bring about change. These powerful influence strategies include modeling, reinforcement, role playing, skill building, modification of thoughts and emotions through cognitive restructuring, and practicing new low-risk alternative behaviors over and over again in a variety of high-risk situations until one gets very good at it (Andrews and Bonta, 2006: 283).

In criminal behavior, Andrews and Bonta (2006) are able to rank-order potential risk/need factors in terms of the strength of their covariation, or at least form sets of major, moderate, and minor risk factors. They introduced the "Central Eight" risk/need factors that incorporate the "Big Four" (history of antisocial behavior domain, antisocial cognition domain, antisocial associates domain, and antisocial personality domain) along with substance abuse and problematic circumstances in the domains of family/marital, school/work, and leisure recreation. All of these are proposed to be the major risk factors variables and indeed the major causal variables in the analysis of criminal behavior of individuals (Andrews and Bonta, 2006: 61) whereas minor risk factors are domain of personal/emotional distress, major mental disorder, physical health issues, fear of official punishment, social class of origin, seriousness of current offense, and other factors unrelated or only mildly related to offending (Andrews and Bonta, 2006: 68).

The PCC is an alternative concept which appropriately use as a guide to select characteristics and circumstances which are the variables, risk factors, for violence in violence risk assessment tool among Thai persons with schizophrenia in the community because it not only addresses the present risk factors for violence, but also how to prevent violence. This study used the PCC that composed of eight major risk factor domain (history of antisocial behavior domain, antisocial cognition domain, antisocial associates domain, antisocial personality domain, school/work domain, family/marital circumstances domain, leisure/recreation domain, and substance abuse domain), and one minor risk factor (major mental disorder domain) (Andrews and Bonta, 2006).

1. History of antisocial behavior domain, a history of antisocial behavior refers to risk/need factors for criminal behavior of individuals related to early involvement in a number and variety of antisocial activities in a variety of setting such as in the home and out of the home. Major indicators include being arrested at a young age, large number of prior offenses, and rule violations while on conditional release. In risk assessment, place the emphasis on early onset and number and variety of offenses (Andrews and Bonta, 2006: 67). The construct of a history of antisocial behavior is also theoretically relevant. It increases self-efficacy beliefs with regard to being able to complete the act successfully and serves as a measure of habit strength in the tradition of behaviorism (Andrews and Bonta, 2006: 156).

2. Antisocial cognition domain, antisocial cognition refers to risk/need factors for criminal behavior of individuals related to set of variables

includes attitudes, values, beliefs, rationalizations, and a personal identity that is favorable to crime (Andrews and Bonta, 2006: 68). Additionally, antisocial cognition also includes negative cognitive-emotional states of resentment and feeling mistreated (Andrews and Bonta, 2006: 227). Specific indicators would include identification with criminals, negative attitudes toward the law and justice system, a belief that crime will payoff, and rationalizations that specify a broad range of conditions under which crime is justified (Andrews and Bonta, 2006: 68).

3. Antisocial associates domain, antisocial associates refers to risk/need factors for criminal behavior of individuals related to both association with procriminal others and relative isolation from anti-criminal others. This risk/need factor is sometimes called "social support for crime" (Andrews and Bonta, 2006: 68). The construct of antisocial associates is also very important. Antisocial associates (including parents, siblings, peers, and others in the immediate situation of action) influence the procriminal versus anticriminal nature of modeling in the situation of action as well as govern the rules by which rewards and costs are signaled and delivered (Andrews and Bonta, 2006: 156).

4. Antisocial personality domain, antisocial personality refers to risk/need factors for criminal behavior of individuals related to personality aspects are weak constraint, negative emotionality, stress reaction, low agreeableness, low conscientiousness, novelty seeking, low self-directedness, low cooperativeness (Andrews and Bonta, 2006: 67-68). Antisocial personality is one of the best predictors of violence behavior. The assumption of antisocial personality is immutable that

change little with time (Andrews and Bonta, 2006). The first meaning is simply the extremes of normal dimensions of personality that are common to all. The second meaning is rooted in psychopathology. A psychopathological perspective considers antisocial personality as a mental disorder, sees it as unhealthy and abnormal (Andrews and Bonta, 2006: 250).

5. School/work domain, school/work refers to risk/need factors for criminal behavior of individuals related to the quality of the interpersonal relationships within the setting of school and/or work. Generally, the risk/need factors are low levels of performance and involvement and low levels of rewards and satisfactions (Andrews and Bonta, 2006: 68). Thus, relatively low levels of academic achievement are the risk factors for criminal behavior, and their predictive validity persists into adulthood (Andrews and Bonta, 2006: 230).

Work is part of being an adult for many people. Seeking work is also a reality for unemployed adults. Stability of employment is a stronger risk factor than is low level of employment. In particular, criminal behavior increases with unemployment and longer periods of unemployment (Andrews and Bonta, 2006: 233).

6. Family/marital circumstances domain, family/marital circumstances refers to risk/need factors for criminal behavior of individuals related to the quality of the interpersonal relationships with the unit (parent-child or spouse-spouse) and the behavioral expectations and rules in regard to antisocial behavior, including monitoring, supervision, and disciplinary approaches (Andrews and Bonta, 2006: 68).

Parental influence operates along two major dimensions. There is a relationship dimension that is a negative parent-child relationship can arouse hostile emotions and lead to antisocial behavior. Then there is a structuring dimension. Along this dimension, the parents' role is to teach and instill prosocial norms, values, and beliefs, as well as the skills to succeed in society. Failure to model prosocial behavior, poor monitoring, and inconsistent disciplining are critical in this regard (Andrews and Bonta, 2006: 211).

In the case of marriage (or its equivalent), look for a high-quality relationship (mutual caring, respect, and interest) in combination with anticriminal expectations. The risk factor is poor quality relationships in combination with either neutral expectations with regard to crime or procriminal expectations (Andrews and Bonta, 2006: 68).

Moreover, neighborhoods where families live can influence the behavior of parents and children. High-crime, disadvantaged neighborhoods can interfere with good parenting practices, stress parent-child bonds, expose youths to other criminals, and provide opportunities for crime (Andrews and Bonta, 2006: 236).

7. Leisure/recreation domain, leisure/recreation refers to risk/need factors for criminal behavior of individuals related to the low levels of involvement and satisfactions in anticriminal leisure pursuits (Andrews and Bonta, 2006: 68). In the PCC consider the risk factor to be noninvolvement in conventional organized leisure time activities and poor use of free time (Andrews and Bonta, 2006: 234).

8. Substance abuse domain, substance abuse refers to risk/need factors for criminal behavior of individuals related to the problems with alcohol

and/or other drugs (tobacco excluded). Current problems with substances indicate higher risk than a prior history of abuse (Andrews and Bonta, 2006: 68).

The relationship between substance abuse and criminal behavior is complex. Substance abuse may influence criminal behavior through the disinhibition of behavioral controls or by directly initiating thoughts that lead to antisocial behavior. Substance abuse may also require unlawful behavior in order to purchase drugs, and buying drugs bring the individual into direct contact with criminals. Alcohol and other drug abuse is a risk factor for crime among adults and young offenders (Andrews and Bonta, 2006: 406).

9. Major mental disorders domain, in major mental disorders, mentally disordered offenders have often been at the center of debate surrounding dangerousness. These offenders pose a risk for further violent behavior and that preventive confinement is needed until they are no longer dangerous (Andrews and Bonta, 2006: 424). The incidence of mental disorders among criminal populations, the major mental disorders, schizophrenia and the other Axis I disorders, are relatively infrequent (Andrews and Bonta, 2006: 423). Axis I disorders are what most would consider the truly clinical syndromes such as schizophrenia (Andrews and Bonta, 2006: 422). Schizophrenia is one of the main psychiatric diagnoses associated with violence (Modestin and Ammann, 1996; Stueve and Link, 1997). Risk factors for violent behavior of individuals with schizophrenia related to type of diagnosis, psychotic symptoms, and treatment.

2.5 Characteristics and circumstances related to violence guide by the PCC theory

The review of the literature is presented using the PCC guide to select characteristics and circumstances for violence among persons with schizophrenia in the community. This is a synthesis and critique of published studies that focuses specifically on characteristics and circumstances associated with violence among persons with schizophrenia in the community. This includes literature examining relationships between violence and the independent variables representing some domains of the PCC.

However, the number of characteristics and circumstances included in the TVRS was reduced from the original 78 to 29 to exclude characteristics and circumstances that are not commonly available in persons with schizophrenia or are difficult to assess routinely such as psychopathy, biological, prenatal, and developmental factors.

In this study, the significant characteristics and circumstances for violence that guided by seven domains of the PCC including: *History of antisocial behavior domain* includes history of violence and history of abuse. *Antisocial associates domain* includes poor peer relationships. *Antisocial personality domain* includes antisocial personality disorder, and aggressive behavior. *School/work domain* include educational failure and limited or no vocational activity. *Family/marital circumstances domain* include poor family relationships and expressed emotions in family. *Substance abuse domain* includes history of substance use, and substance abuse. *Major mental disorder domain* includes younger age at first hospitalization with schizophrenia, delusions, hallucinations, thought disorder, excitement,

suspicious, hostility, lack of insight, symptoms of mania, depressive symptoms, threat/control override symptom, uncoorperativeness, disorientation, and medication noncompliance. Other characteristics such as younger age, male gender, living alone, homeless, and weapon availability were selected from the literature review. All of these are significant characteristics and circumstances which are the variables for violence among persons with schizophrenia in the community.

The discussion included characteristics and circumstances that related to violence among persons with schizophrenia in the community are as follows.

2.5.1 Characteristics related to violence among persons with schizophrenia in the community

In this study, significant characteristics which are the variables for violence among persons with schizophrenia in the community include younger age, male gender, antisocial personality disorder, educational failure, living alone, younger age at first hospitalization with schizophrenia, history of substance use, limited or no vocational activity, history of violence, history of abuse, aggressive behavior, delusions, hallucinations, excitement, suspiciousness, hostility, lack of insight, symptoms of mania, depressive symptoms, threat/control override symptom, uncoorperativeness, disorientation, medication noncompliance, substance abuse, homeless, and weapon availability.

1. Younger age, younger age has been significantly associated with violence in a number of studies. Age as a characteristic is known to interact with other characteristics and circumstances for violence, namely diagnosis and phase of

the illness (McNiel, 1997). In persons with schizophrenia, the violence has been found to diminish with age in a variety of studies. Violent persons with schizophrenia tend to be younger, predominantly under 40 years of age (Abu-Akel and Abushua'leh, 2004; Brekke et al., 2001; Swanson et al., 2006; Walsh et al., 2004).

For instance, Abu-Akel and Abushua'leh (2004) studied in theory of mind in violent and nonviolent patients with paranoid schizophrenia. The finding found that most patients were young age 31.1 ± 8.9 (mean=36.2, SD=10.1). Brekke and others (2001) studied in risks for individuals with schizophrenia who are living in the community. The finding found that eighty-three individuals (48%) had contact with the police during the study period. A small percentage of the contacts involved aggressive behavior against property or persons and being younger (age mean=33.2, SD=7.3). Similarly, a prospective study in predicting violence in schizophrenia by Walsh and others (2004) found that of the 271 persons with schizophrenia who committed assault during follow-up were significantly more likely to be under 40 years of age (OR = 2.05, 95% CI 1.12–3.77, p = 0.02).

In Thailand, a retrospective study, Prapat Ukranan and Veeradech Veerapongset (1998) studied about psychotic patient and violent crime (N=283). The findings found that 78.8% of persons with a diagnosis of schizophrenia (n=223) and most of them were 25-29 years old (23%). Ranee Chayintu and Nongluck Sattra (2000) studied in the first offending and re-offending among forensic psychiatric patients and their correlates (N=323). The findings found that most of patients were diagnosed with psychosis (72.8%) and most of them were 21-30 years old (39.9%). In qualitative study, Suphanee Sangrugsa (2003) studied in mental disorder and social factors among murdering Thai offenders (N=15). The results

showed that most samples were murdering offenders with schizophrenia (n=7) and 23-48 years old. Natthawut Arin (2004) studied in the commission of crime and criminal responsibility in forensic psychiatric offenders (N=34). The results showed that most subjects were diagnosed as schizophrenia (n=24, 70.6%) and most of them were 15-38 years old.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through younger age based on literature review is person who is being the age of 40 years or under.

2. Male gender, gender is an important characteristics for violence. Males are deemed to be more likely to be violent than females (Monahan et al., 2000; Stueve and Link, 1998). Most researches of persons with schizophrenia have found men to be more likely than women to engage in violence (Ran et al., 2010; Vevera et al., 2005; Walsh, Buchanan, and Fahy, 2002). For instance, Ran and others (2010) explored the prevalence and risk factors for self-reported criminal behavior among persons with schizophrenia in rural China. They used data from a 14-year prospective follow-up study (1994–2008) of criminal behavior among a cohort (N=489; male=224 and female=265) of persons with schizophrenia in Xinjin County, China. The results showed that male patients had significantly higher rate of any criminal behavior (13.8%) than female patients (6.8%) ($\chi2$=6.7, df=1, p=0.01). Compared with female subjects (6 cases, 20.0%), male patients had significantly higher rate of violent criminal behavior (e.g., arson, sexual assault, physical assault, and murder) (24 cases, 80.0%) ($\chi2$=9.3, df=1, p=0.002). Bivariate analyses showed that the risk of criminal behavior was significantly associated with being male. In

multivariate logistic regression analyses being male (OR=2.28, *p*=0.009, 95% CI=1.23-4.23) were identified as independent predictors of increased criminal behavior in persons with schizophrenia in the follow-up period.

In Thailand, a retrospective study, Prapat Ukranan and Veeradech Veerapongset (1998) studied about psychotic patient and violent crime (N=283). The findings found that 78.8% of patients with a diagnosis of schizophrenia (n=223) and most of them were male (n=252, 89%). Ranee Chayintu and Nongluck Sattra (2000) studied in first offending and re-offending among forensic psychiatric patients and their correlates (N=323). The findings found that most of subjects were diagnosed with psychosis (72.8%) and most of them were male (n=271, 83.9%). In qualitative study, Suphanee Sangrugsa (2003) studied in mental disorder and social factors among murdering Thai offenders (N=15). The results showed that most samples were murdering offenders with schizophrenia (n=7) and most of them were male (n=14). Natthawut Arin (2004) studied in the commission of crime and criminal responsibility in forensic psychiatric offenders (N=34). The results showed that most subjects were diagnosed as schizophrenia (n=24, 70.6%) and most of them were male (n=29).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through male gender based on literature review is person who is being a man.

3. Antisocial personality disorder, to understand antisocial personality disorder (ASPD), it is necessary to learn what having any personality disorder involves.

Violence is associated with certain personality disorders. The most common personality disorder associated with violence is ASPD. ASPD is defined primarily in terms of behavior that is, persistent violations of social norms (Nolan et al., 1999). DSM-IV states that this disorder is characterized by a pervasive pattern of disregard for and violation of the rights of others that begins in childhood or early adolescence and continues into adulthood (Marmar, 2000). ASPD is differentiated from the other personality disorders by a pervasive pattern of disregard, and violation of, the rights of others (Andrew and Bonta, 2006: 251).

The current criteria of ASPD were described by the World Health Organization's ICD-10 (1992). ICD-10 defines a conceptually similar disorder to antisocial personality disorder called (F60.2) dissocial personality disorder. It is characterized by at least 3 of the following:

1. Callous unconcern for the feelings of others and lack of the capacity for empathy.

2. Gross and persistent attitude of irresponsibility and disregard for social norms, rules, and obligations.

3. Incapacity to maintain enduring relationships.

4. Very low tolerance to frustration and a low threshold for discharge of aggression, including violence.

5. Incapacity to experience guilt and to profit from experience, particularly punishment.

6. Markedly prone to blame others or to offer plausible rationalizations for the behavior bringing the subject into conflict.

7. Persistent irritability.

ASPD is views as stable personality traits that change little with time. With respect to violence, ASPD is important characteristics in determining violence in person with schizophrenia (Angermeyer, 2000; Eriksson, 2008; Fullam, and Dolan, 2006; Hodgins, Hiscoke, and Freese, 2003; Hodgins, Lapalme, and Toupin, 1999). For instance, Hodgins and others (1999) found that in a 2-year follow-up in 30 males with major affective disorders and 74 with schizophrenia, 15% of those with schizophrenia had committed crimes, most violent. Co-morbid antisocial personality disorder was associated with criminality among the patients with schizophrenia but not among those with major affective disorders.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through ASPD based on literature review is person who met the characteristics as ASPD based on ICD-10.

4. Educational failure, educational failure is a lack of success in doing or achieving education. Children' level of academic achievement and experiences in school are related to violence. Level of academic that related to violence refers to person who has not finished secondary school (Monahan, 1993b cited in Blumenthal and Lavender, 2000). Moreover, person who had been little interested in school and perform poorly on academic tasks from a young age are at risk not only for school failure and dropout, but also for associating with delinquent peers and engaging in antisocial behavior that associated with an increased violence. Thus, poor education is a robust predictor of both past and future violence (Abrams and Teplin, 1990 cited in Blumenthal and Lavender, 2000) and has been related to increased risk of violence (Stueve and Link, 1997; Walsh et al., 2004).

In persons with schizophrenia, Cannon and others (2002) investigated whether such risk factors are associated with criminal behavior in an epidemiological cohort of patients with schizophrenia (N=636). The results showed that poor educational attainment and poor grades for attention at school were significantly associated with the risk of criminal offending in adulthood in this sample of patients with schizophrenia. Joyal and others (2004) investigated the surrounding context, psychotic symptoms, target characteristics and other circumstantial factors associated with homicidal acts committed by men with schizophrenia, with (n=35) or without (n=23) an additional antisocial personality disorder (ASPD). The results showed that received fewer years of education was associated with homicidal acts.

In Thailand, a retrospective study, Prapat Ukranan and Veeradech Veerapongset (1998) studied about psychotic patient and violent crime (N=283). The findings found that 78.8% of patients with a diagnosis of schizophrenia (n=223) and most of them were educated in primary school (n=145, 51.2%). Ranee Chayintu and Nongluck Sattra (2000) studied in the first offending and re-offending among forensic psychiatric patients and their correlates (N=323). The findings found that most of patients were diagnosed with psychosis (72.8%) and most of them educated in primary school (n=160, 49.5%). In qualitative study, Suphanee Sangrugsa (2003) studied in mental disorder and social factors among murdering Thai offenders (N=15). The results showed that most samples were murdering offenders with schizophrenia (n=7) with educated in primary school (n=9). Natthawut Arin (2004) studied in the commission of crime and criminal responsibility in forensic psychiatric offenders (N=34). The results showed that most subjects were diagnosed as schizophrenia (n=24, 70.6%) and were educated in primary school (n=19, 55.9%).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through educational failure based on literature review is person who has been failure to continue elementary or secondary school because of poor grade and/or other behavioral problems.

5. Living alone, evidence has indicated that patients living alone were significantly more likely to engage in any violence than their counterparts who were living with partner. Moreover, although family and/or marriage might be strong predictors of violent behavior (Modestin, 1998; Andrews et al., 2006), evidence also indicated that unmarried patients had higher risk of violent behavior as they would have less family members or caregivers in their social networks than married patients (Melle et al., 2000).

Most researches of persons with schizophrenia who committed violence were without partner (Fresan et al., 2005; Modestin, and Ammann, 1996). Fresan and others (2005) investigated the relationship of violent behavior with sociodemographic and clinical features in schizophrenic patients. The finding found that marital status (with and without partner) was predictive variable for violent behavior in schizophrenia, in which the patients without partner (OR=27.42, 95% CI 2.05-365.69 p=.01) have a risk that 26.4 times grater of being violent in comparison with those with partner. Similarly with Modestin and Ammann (1996) investigated lifetime prevalence of criminal behavior in a population of male schizophrenic patients. The finding found that a total of 282 schizophrenic patients were mostly single (85%). The stepwise discriminant analysis yielded the divorced or widowed

marital status is the best discriminating between patients with and without criminal records.

In Thailand, a retrospective study, Prapat Ukranan and Veeradech Veerapongset (1998) studied about psychotic patient and violent crime (N=283). The findings found that 78.8% of patients with a diagnosis of schizophrenia (n=223) and most of them were single (n=172, 60.7%). Ranee Chayintu and Nongluck Sattra (2000) studied in first offending and re-offending among forensic psychiatric patients and their correlates (N=323). The findings found that most of patients were diagnosed with psychosis (72.8%). Moreover, most of subjects were single (n=185, 57.3%) and divorce (n=42, 13%). In qualitative study, Suphanee Sangrugsa (2003) studied in mental disorder and social factors among murdering Thai offenders (N=15). The results showed that most samples were murdering offenders with schizophrenia (n=7). Moreover, subjects were single (n=6), separated (n=4), divorce (n=3), and widow (n=1). Natthawut Arin (2004) studied in the commission of crime and criminal responsibility in forensic psychiatric offenders (N=34). The results showed that most subjects were diagnosed as schizophrenia (n=24, 70.6%). Moreover, most subjects were single (n=20) and separated (n=7).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through living alone based on literature review is person who is living without partner or other persons in his or her house regardless of marital status.

6. Younger age at first hospitalization with schizophrenia, hospitalization means someone who are sent or admitted to hospital (Collins

COBUILD English Dictionary, 2006). Most research of persons with schizophrenia has found younger age at first hospitalization have a clear associated with violence than non psychiatric patients (Fresan et al., 2005; Nolan et al., 1999). Foe instance, Fresan and others (2005) investigated the relationship of violent behavior with sociodemographic and clinical features in schizophrenic patients. The findings found that from the total sample (N=106), 49.1 % of the patients were classified as violent (n=52). Age of first psychiatric hospitalization (average age 24.4 ± 6.2 years; 14-42 years) (OR=6.03, 95% CI 1.93-18.84 p=.002) was predictive variables for violent behavior in schizophrenia, in which an early age of hospitalization meant a risk that was 5.03 times greater for being violent.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through younger age at first hospitalization with schizophrenia based on literature review is person who has been the first time admitted in the hospital at the age of 30 or before.

7. History of substance use, a history of excessive alcohol drinking and drug use of persons with schizophrenia was other key characteristics positively correlated with the violence. Patients with a history of criminal offenses and substance use disorder were 5.6 and 20.1 times more likely to exhibit violent behavior. Erkiran and others (2006) studied in substance abuse amplifies the risk for violence in schizophrenia spectrum disorder. The findings found that history of substance use disorder were significantly predicted violence (OR=5.62, p=0.04 95% CI=1.07–29.37; OR=20.10, p <0.01 95% CI=5.03–80.27, respectively). In follow-up studies of persons with schizophrenia, moreover, a history of substance abuse and/or

dependence has typically been found to be a risk factor for future violent behavior (Appelbaum, Robbins, and Monahan, 2000; Tengstrom et al., 2000).

In Thailand, a retrospective study, Prapat Ukranan and Veeradech Veerapongset (1998) studied about psychotic patient and violent crime (N=283). The findings found that 78.8% of patients with a diagnosis of schizophrenia (n=223) and most of them were had history of drug use (n=91, 33.2%) and alcohol use (n=69, 25.2%). Ranee Chayintu and Nongluck Sattra (2000) studied in first offending and re-offending among forensic psychiatric patients and their correlates (N=323). The findings found that most of patients with psychosis (72.8%). Some of subjects were had history of substance use for the first offending (n=73, 51.4%) and recidivism (n=69, 48.6%). In qualitative study, Suphanee Sangrugsa (2003) studied in mental disorder and social factors among murdering Thai offenders (N=15). The results showed that most samples were murdering offenders with schizophrenia (n=7) and most of them were had history of substance use (n=10) including alcohol (n=7), amphetamine (n=3), cannabis (n=3), and inhalants (n=1). Natthawut Arin (2004) studied in the commission of crime and criminal responsibility in forensic psychiatric offenders (N=34). The results showed that most subjects were diagnosed as schizophrenia (n=24, 70.6%) and had history of drug use (n=20, 58.8%).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through history of substance use based on literature review is person who has been excessively used alcohol and/or drugs (amphetamine, cannabis, benzodiazepines, inhalants, opiates, stimulants etc.) or diagnosed as substance use disorder or abuse or dependence.

8. Limited or no vocational activity, Swanson and others (2006) examined the prevalence and correlates of violence among schizophrenic patients living in the community by developing multivariable statistical models to assess the net effects of psychotic symptoms and other risk factors for minor violence (corresponding to simple assault without injury or weapon use) and serious violence (corresponding to any assault using a lethal weapon or resulting in injury, any threat with a lethal weapon in hand, or any sexual assault). The results showed that the final model shows minor violent behavior was significantly more likely among participants (N=1,115) with limited or no vocational activity.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through limited or no vocational activity based on literature review is person who is unemployed, being layoff, or no activity related to any occupations.

9. History of violence, a widely held belief is that persons who commit violence are likely to commit further violence. History of violent behavior alone appears to be the best predictor of violence (Buchanan, 1997; Monahan et al., 2000). A history of violence is helpful to ask individuals about the most violent thing that they have ever done. For example, a person who has used weapons against others in the past may pose a serious risk of future violence (Scott and Resnick, 2006). Thus, history of violence is the most significant predictor of violence and risk assessment requires that the potentially violent need to be distinguished from a population who have been violence in the part (Blumenthal and Lavender, 2000). Moreover, history of violence variables represent the more or less static background factors included in

earlier actuarial tools (Doyle and Dolan, 2004) and widely considered the best predictor of future violence risk (Lindenmayer et al., 2002). From the literature review, history of violence of persons with schizophrenia in the community that associated with an increased chance of future violence (Bin and Bei, 1995; Bobes, Fillat, and Arango, 2009; Brekke et al., 2001; Ran et al., 2010; Swanson et al., 2006).

In Thailand, Natthawut Arin (2004) studied in the commission of crime and criminal responsibility in forensic psychiatric offenders (N=34). The results showed that most subjects were diagnosed as schizophrenia (n=24, 70.6%) and most of them were having history of criminal behavior (n=13, 38.2%). Ranee Chayintu and Nongluck Sattra (2000) studied in the first offending and re-offending among forensic psychiatric patients and their correlates (N=323). The findings found that most of patients were diagnosed with psychosis (72.8%) and some of subjects were having history of violence (n=104). Moreover, the re-offending rate was 33.1% and most of them were the re-offenses (n=107). In addition, 43 (40.20%) of them were re-offence within 6 months, 24 (22.4%) of them were re-offence within 7-12 months, 19 (17.8%) of them were re-offence within 2-5 years, 13 (12.1%) of them were re-offence within 1-2 years, and 8 (7.5%) of them were re-offence within 5 years or more.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through history of violence based on literature review is persons who having past evidences of being committed intentional use of physical force, threatened or actions, against another person, one self, or a group of people that involved with or without weapon.

10. History of abuse, persons with schizophrenia are more likely to be abuse than others, especially childhood and adult physical abuse to be highly significant in predicting adult violence among their sample of discharged schizophrenic patients (Fitzgerald et al., 2005; Monahan et al., 2001).

From the literature review, history of abuse of persons with schizophrenia in the community that associated with an increased chance of future violence including child physical abuse (Swanson et al., 2006; Yesavage, and Zarcone, 1998), adult physical abuse (Yesavage, and Zarcone, 1998), and sexual abuse (Swanson et al., 2006). In qualitative study, Suphanee Sangrugsa (2003) studied in mental disorder and social factors among murdering Thai offenders (N=15). The results showed that most samples were murdering offenders with schizophrenia (n=7) and most of them were having abuse from the victims (n=10). Natthawut Arin (2004) studied in the commission of crime and criminal responsibility in forensic psychiatric offenders (N=34). The results showed that most subjects were diagnosed as schizophrenia (n=24, 70.6%) and some of them were having history of child abuse (n=6, 17.6%).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through history of abuse based on literature review is persons who having past evidences of being insulted from other persons including sexual abuse.

11. Aggressive behavior, aggressive behavior and violence have various meanings. Anderson and Bushman (2002) see the difference between aggressive behavior and violence to be a matter of degree, with aggressive behavior

defined as a group that includes incidents of battery that did not result in injury (Monahan et al., 2001) or behavior intended to produce deliberate harm to another and violence having extreme harm as its intent (such as murder). Aggressive behavior defines as a state of arousal manifested by various emotional communicative strategies (e.g., shouting, gesturing, etc.). In contrast, violence defines as the physical attack of one person by another in the context of aggressive behavior. On this basis, one can be aggressive without being violent, but not the reverse (Anderson and Bushman, 2002).

In persons with schizophrenia, many studies analyzed aggressive behaviors of persons with schizophrenia before hospitalization. It has been shown that nearly 20% of first contact inpatients with schizophrenia behaved in an aggressive manner, and that nearly 50% of hospitalizations are due to violence occurring immediately before admission (Humphreys et al., 1992; Volavka et al., 1997). Thus, aggressive behavior is characteristics that associated with increasing violence among persons with schizophrenia (Bobes et al., 2009; Fresan et al., 2005; Fullam, and Dolan, 2006). From the literature review, aggressive behaviors of persons with schizophrenia in the community that associated with an increased chance of future violence include verbal aggression (makes loud noises, shouts angrily, mild personal insults, foul language, moderate threats, and clear threats of violence, needs help), physical aggression against objects (slams door, scattering clothing, making a mess, kicks objects, breaks objects, shatters windows, and sets fires, throws objects), physical aggression against others (gestures, swings at people, grabs at clothes, strikes, kicks, pulls hair, attacks others, causing mild to moderate physical injury, and causing serious physical injury) (Bobes et al., 2009; Fresan et al., 2005), and physical

aggression against self (picks or scratches skin, pulls hair, bangs head or objects. hurts self without serious injury, small cuts or bruises, minor burns, mutilates self, deep cuts, and serious injury) (Bobes et al., 2009).

Indicators of aggressive behavior were identified in the Modified Overt Aggression Scale (MOAS) (Yudofsky et al., 1986) as follow:

1. Verbal aggression

2. Physical aggression against objects

3. Physical aggression against self

4. Physical aggression against others.

Moreover, Bobes and others (2009) evaluated the risk of aggressive–violent behavior among outpatients with schizophrenia. The final model showed that recent violent episodes (within the previous week) were significantly more likely among patients with a history of aggressive behavior.

In Thailand, in qualitative study, Suphanee Sangrugsa (2003) studied in mental disorder and social factors among murdering Thai offenders (N=15). This study explored psychosocial factors associated with psychiatric disorders. The results showed that most samples were murdering offenders with schizophrenia (n=7) and having aggressive behavior.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through aggressive behavior based on literature review including verbal aggression, physical aggression against objects, physical aggression against others, and physical aggression against self.

12. Delusions, delusions mean an unshakable belief in something untrue. These irrational beliefs defy normal reasoning, and remain firm even when overwhelming proof is presented to dispute them (Medical Dictionary, 2010). Goldman and Foreman (2000) defined delusion as a false belief or idea firmly held despite abundant contradictory evidence.

In persons with schizophrenia, acts of violence have been associated with delusional thought (Cheung et al., 1997; Fresan et al., 2005; Koen et al., 2004; Laajasalo and Hakkanen, 2006; Swanson et al., 2006). Violent schizophrenic patients had a significantly higher frequency of delusions of persecution than patients categorized as 'non- violent', supporting the premise that it is the nature of the delusional beliefs, rather than simply the presence of delusional beliefs, that may influence rates of violence (Cheung et al., 1997; Harris and Lurigio, 2007; Paterson et al., 2004).

Buchanan and others (1993) found that persons with delusions reported that they were most likely to act on their delusions when frightened, sad, or anxious because of their beliefs. In a controlled study of 31 violent subjects with schizophrenia (Cheung et al., 1997), the violent subjects more frequently had persecutory delusions that caused them to feel angry. The study by Cheung and others further showed that voices were more likely to be associated with violence if the tone, content, and emotion of the voices were negative. This group also found that persecutory delusions were more likely to be acted upon than delusions of guilt or catastrophe (Wessely et al., 1993).

From the literature review, delusional symptoms that related to violence among persons with schizophrenia are including:

Delusion of jealousy (Suphanee Sangrugsa, 2003; Swanson et al., 2006) is an abnormal belief that one's sexual partner is unfaithful (Pull, 1995).

Delusion of persecution (Cheung et al., 1997; Erkiran et al., 2006; Laajasalo and Hakkanen, 2006; Swanson et al., 2006) is being followed, harassed, threatented, or plotted against (Goldman and Foreman, 2000).

Delusion of grandiose (Fullam, and Dolan, 2006; Swanson et al., 2006) is being influential and important, perhaps having occult powers, or actually being some powerful figure out of history (Goldman and Foreman, 2000).

Delusion of bizarre (Laajasalo and Hakkanen, 2006; Swanson et al., 2006) mean one that is patently absurd, with no possible basis in fact (Medical Dictionary, 2010).

Delusion of being controlled (Koen et al., 2004; Laajasalo and Hakkanen, 2006; Suphanee Sangrugsa, 2003; Swanson et al., 2006) is thoughts, feelings, or behaviors are controlled by external forces (Goldman and Foreman, 2000).

Delusion of misidentification syndromes/somatic (Swanson et al., 2006) is a belief that the identity of a person, object or place has somehow changed or has been altered (Wikipedia Encyclopedia Dictionary, 2010).

Delusion of reference (Swanson et al., 2006) is external events or portents have personal significance, such as special messages or commands. A person with delusions of reference believes that strangers on the street are talking about him or her, the television commentator is sending coded messages, etc (Goldman and Foreman, 2000).

Delusion of religious (Swanson et al., 2006) is any delusion with a religious or spiritual content. These may be combined with other delusions, such as grandiose delusions (the belief that the affected person was chosen by God, for example), delusions of control, or delusions of guilt. Beliefs that would be considered normal for an individual's religious or cultural background are not delusions (American Psychiatric Association, 2000).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through delusions based on literature review including delusions of jealousy, persecution, grandiose, being controlled, and reference.

13. Hallucinations, hallucinations mean false or distorted sensory experiences that appear to be real perceptions. These sensory impressions are generated by the mind rather than by any external stimuli, and may be seen, heard, felt, and even smelled or tasted (Medical Dictionary, 2010). Goldman and Foreman (2000) defined hallucinations as a false sensory perception of something that is not there.

Persons suffering from schizophrenia frequently experience hallucinations (Arango et al., 1999; Fresan et al., 2005; Joyal et al., 2004; Laajasalo and Hakkanen, 2006; Swanson et al., 2006). The individual experiences direct instructions to carry out an act, usually in the form of an auditory hallucination (Junginger 1996). The relationship between violence and hallucinations has been studied virtually exclusively in relation to command hallucinations. Among persons

with schizophrenia had hallucinations at the time of the offence (Junginger, 1990; Laajasalo and Hakkanen, 2006).

From the literature review, hallucinations in relation to violence among persons with schizophrenia are including:

Command hallucination (Laajasalo and Hakkanen, 2006; Swanson et al., 2006) is a condition in which individuals hear and sometimes obey voices that command them to perform certain acts. The hallucinations may influence them to engage in behavior that is dangerous to themselves or to others (Mosby's Medical Dictionary, 2009).

Auditory hallucination (Laajasalo and Hakkanen, 2006; Swanson et al., 2006; Volavka et al., 1997) is false perceptions of sounds (voices, music, buzzing, motor noises, murmuring) (Goldman and Foreman, 2000).

Visual hallucination (Laajasalo and Hakkanen, 2006; Swanson et al., 2006) is false visual perceptions with eyes open in a lighted environment (Goldman and Foreman, 2000).

Olfactory hallucination (Laajasalo and Hakkanen, 2006) is false perceptions of smell (Goldman and Foreman, 2000).

Gustatory hallucination (Laajasalo and Hakkanen, 2006) is false perceptions of taste (Goldman and Foreman, 2000).

Tactile hallucination (Laajasalo and Hakkanen, 2006) is false sensations of touch (Goldman and Foreman, 2000).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through hallucinations based on literature review including command hallucination, auditory hallucination, and visual hallucination.

14. Excitement, excitement is expressing feelings without restraint, manifesting speech that is hurried, exhibiting an elevated mood, showing an attitude of superiority, dramatizing oneself or one's symptoms, manifesting loud and boisterous speech, exhibiting overactivity or restlessness, and exhibiting excess of speech (Stahl, 2010). This symptom is characterized as "hyperactivity as reflected in accelerated motor behavior, heightened responsivity to stimuli, hypervigilance, or excessive mood lability." So, when patients are excitement, they might be committed violence.

In persons with schizophrenia, acts of violence have been associated with excitement (Fresan et al., 2005; Fullam, and Dolan, 2008; Volavka et al., 1997; Swanson et al., 2006). For instance, Fresan and others (2005) investigated the relationship between violent behavior and psychiatric symptomatology in schizophrenic patients. The finding found that violent behaviors were associated with excitement. Fullam and Dolan (2008) examined the role of executive function deficits in inpatient violence using measures of dorsolateral prefrontal cortical (DLPFC) and ventrolateral prefrontal cortical (VLPFC) function in inpatient violence in forensic patients with schizophrenia. The finding found that higher rates of violence were significantly associated with higher excitement symptom scores. Swanson and others (2006) examined the prevalence and correlates of violence among schizophrenia patients living in the community by developing multivariable statistical models to assess the net effects of psychotic symptoms and other risk factors for minor and serious violence. The finding found that positive psychotic symptoms, such as persecutory ideation, increased the risk of minor and serious violence, while serious violence was associated with excitement.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through excitement based on literature review is who having expressing feelings without restraint, manifesting speech that is hurried, exhibiting an elevated mood, showing an attitude of superiority, dramatizing oneself or one's symptoms, manifesting loud and boisterous speech, exhibiting over activity or restlessness, and exhibiting excess of speech.

15. Suspiciousness, suspiciousness means disposed to suspect something wrong or indicative or expressive of suspicion (Collins English Dictionary, 2006). This symptom is characterized by "unrealistic or exaggerated ideas of persecution, as reflected in guardedness, a distrustful attitude, or suspicious hypervigilance that others mean one harm." So, when patients are suspicious, they might be afraid of everyone, everything, and every interaction around them (Schwecke, 2007).

Several studies have showed an association between suspiciousness and violent behavior in persons with schizophrenia (Krakowski, Czobor, and Chou, 1999; Moran and Hodgins, 2004; Nolan et al., 1999; Swanson et al., 2006; Tengstrom et al., 2004). For instance, Krakowski and others (1999) examined persistence and resolution of violence in relation to psychotic symptoms, ward behaviors, and neurological impairment. Psychiatric symptoms and ward behaviors were assessed in violent inpatients with schizophrenia or schizoaffective disorder. The finding found that at the end of 4 weeks, the persistently violent patients had evidence of more severe suspiciousness. Swanson and others (2006) examined the prevalence and correlates of violence among schizophrenic patients living in the

community by developing multivariable statistical models to assess the net effects of psychotic symptoms and other risk factors for minor and serious violence. The finding found that serious violence was associated with suspiciousness.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through suspiciousness based on literature review is who having unrealistic or exaggerated ideas of persecution, as reflected in guardedness, a distrustful attitude, or suspicious hypervigilance.

16. Hostility, hostility means an emotional state characterized by enmity toward others and a desire to harm those at whom the antagonism is directed (Mosby's Medical Dictionary, 2009). The rating of hostility assessed "verbal and nonverbal expressions of anger and resentment." This symptom was associated with an increased chance of future violence.

Several studies have showed an association between hostility and violent behavior in persons with schizophrenia (Abu-Akel and Abushua'leh, 2004; Fullam, and Dolan, 2006; Soyka et al., 2007; Swanson et al., 2006). For instance, Soyka and others (2007) found that significantly higher risk of violent crimes in persons with schizophrenia with a hostility syndrome at discharge. At admission, expected and observed probabilities of future criminality were especially high when the score for hostility syndrome was high. If a severe hostility syndrome was present at discharge, probabilities of later criminal behavior were even higher. Patients with a mild or severe hostility syndrome at admission were more likely to show later criminal behavior or to commit violent crimes than patients without a hostility syndrome (OR=1.15 and 1.71, respectively). Later criminal convictions were

frequent in patients with mild or severe hostility at discharge than in those without any hostility (OR=1.93 and 3.45, respectively). Swanson and others (2006) examined the prevalence and correlates of violence among schizophrenia patients living in the community by developing multivariable statistical models to assess the net effects of psychotic symptoms and other risk factors for minor and serious violence. The finding found that serious violence was associated with hostility.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through hostility based on literature review is who having an emotional state characterized by enmity toward others and a desire to harm those at whom the antagonism is directed.

17. Lack of insight, insight is the patient's degree of understanding of his or her medical or psychological problems (Mueller, Kiernan, and Langston, 2000). Lack of insight means deficiency or absence of the awareness and understanding into illness. Lack of insight into illness is a core and most common characteristics of persons with schizophrenia. Lower levels of insight in schizophrenia have been associated with poorer long-term outcome (Amador et al., 1993; Kemp, and David, 1995; Schwartz, Cohen, and Grubaugh, 1997), worse executive function deficits (Dickerson et al., 1997), and more persistent positive symptoms (Buckley et al., 2001). Psychotic patients with poor awareness of having a mental illness also show poor compliance with both pharmacological (Kemp, and David, 1995) and psychosocial treatments (Lysaker et al., 1994).

Several studies have showed an association between lack of insight and violent behavior in persons with schizophrenia (Arango et al., 1999;

Buckley et al., 2006). For instance, Buckley and others (2004) found that violent patients with schizophrenia had more prominent lack of insight regarding their illness and legal complications of their behavior when compared with a nonviolent comparison group. Moreover, Soyka and others (2007) found that significantly higher rates of criminal conviction and recidivism were found for patients with schizophrenia with lack of insight at discharge. In addition, Arango and others (1999) evaluated several variables in the prediction of violence in 63 inpatients with a DSM-IV diagnosis of schizophrenia or schizoaffective disorder. The finding found that violent patients had significantly more positive symptoms as measured by the Positive and Negative Syndrome Scale (PANSS), higher scores on the PANSS general psychopathology scale, and less insight in the different constructs assessed. A logistic regression was performed to discriminate between violent and nonviolent patients. Three variables entered the model: insight into symptoms, PANSS general psychopathology score, and violence in the previous week. The actuarial model correctly classified 84.13 percent of the sample; this result is significantly better than chance for the base rate of violence in this study. At hospital admission, clinical rather than sociodemographic variables were more predictive of violence. This study is the first to demonstrate that insight into psychotic symptoms is a predictor of violence in schizophrenia.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through lack of insight based on literature review is who having deficiency or absence of the awareness and understanding into his or her illness.

18. Symptoms of mania, mania is an abnormally elated mental state, typically characterized by feelings of euphoria, lack of inhibitions, racing thoughts, diminished need for sleep, talkativeness, risk taking, and irritability (Medical Dictionary, 2010). In persons with schizophrenia, acts of violence have been associated with symptoms of mania. Hodgins and others (1999) studied in criminal activities and substance use of patients with major affective disorders and schizophrenia: a 2-year follow-up. Thirty males with major affective disorders and 74 with schizophrenia were followed for 2 years. The finding found that at discharge the patients showed few symptoms. However, those with schizophrenia were rated as showing significantly more symptoms of mania. In qualitative study, Suphanee Sangrugsa (2003) studied in mental disorder and social factors among murdering Thai offenders (N=15). This study explored psychosocial factors associated with psychiatric disorders. The results showed that most samples were murdering offenders with schizophrenia (n=7) and most of them were symptoms of mania.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through symptom of mania based on literature review is who having an abnormally elated mental state, typically characterized by feelings of euphoria, lack of inhibitions, racing thoughts, diminished need for sleep, talkativeness, risk taking, and irritability.

19. **Depressive symptoms,** depressive symptoms mean a state of being depressed marked especially by sadness, inactivity, difficulty with thinking and concentration, a significant increase or decrease in appetite and time spent

sleeping, feelings of dejection and hopelessness, and sometimes suicidal thoughts or an attempt to commit suicide (Gale Encyclopedia of Medicine, 2008**).**

Median prevalence of depression is about 25% or more in schizophrenia. These symptoms can occur at any time during the illness, including years after the acute phase, but they do respond to antidepressants (Keltner, 2007). From the literature review found that depressive symptoms are the characteristics for violence in schizophrenic patients (Soyka et al., 2007; Swanson et al., 2006). They are regret, anguish, helplessness, and hopelessness. Moreover, they feel awkward, ugly, dull, slovenly, and unlovable. In addition, they also feel no one likes them, suffering, decrease in functional status, poor outcome, and suicide idea/ behavior (Hirayasu, 2000).

Early evidence from the NATO multinational study indicated that increases in depressive symptoms, as measured by the Positive and Negative Syndrome Scale (PANSS, Kay, Opler, and Riszbein, 2001), were highly predictive (OR=10.5–14.9) of later community violence among schizophrenic patients (Freese et al., 2002). A retrospective study in clinical correlates of later violence and criminal offences in schizophrenia by Soyka and others (2007) found that of the 1,662 subjects with schizophrenia, of the nine the Association for Methodology and Documentation in Psychiatry (AMDP) syndromes, only two (hostility and depressive syndrome) reached statistical significance in the binary regression model. Swanson and others (2006) studied in a national study of violent behavior in persons with schizophrenia. The finding found that the final model shows that serious violence was associated with psychotic and depressive symptoms, childhood conduct problems, and victimization. Moreover, suicide is a significant cause of premature death in persons

with schizophrenia (Caldwell and Gottesman, 1992), with lifetime estimates ranging from 5 to 13% (Caldwell and Gottesman, 1990; Palmer et al., 2005).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through depressive symptoms based on literature review is who having sadness, inactivity, difficulty with thinking and concentration, a significant increase or decrease in appetite and time spent sleeping, feelings of dejection and hopelessness, and sometimes suicidal thoughts or an attempt to commit suicide.

20. Threat/control override symptoms, threat/control override (TCO) symptoms refer to specific cluster psychotic symptoms. Individuals with TCO symptoms experience that people want to harm them (threat) and/or that they can not control their own thinking due to either the mind dominated by forces outside of their own control or that other people's thoughts were put into their heads (override) (Eriksson, 2008). TCO symptoms have been hypothesized to be an important link between symptoms and violence. Evidence for an association between TCO symptoms and violence have been demonstrated, especially in schizophrenic patients (Angermeyer, 2000; Hodgins et al., 2003; Stompe et al., 2004; Walsh et al., 2002).

Several studies have showed an association between TCO and violent behavior in persons with schizophrenia (Angermeyer, 2000; Hodgins et al., 2003; Stompe et al., 2004; Walsh et al., 2002). For instance, Link and Stueve identified among the range of delusional symptoms a few that were significantly more frequently than others related to violence. As these symptoms describe a patient's feeling of being "gravely threatened by someone who intends to cause harm" and of

an override of self-control through external forces, they were called threat/control-override (TCO) symptoms (Link and Stueve, 1994 cited in Stompe et al., 2004). TCO symptoms represent experiences of patients feeling that people are trying to harm them and experiences of their minds being dominated by forces outside their control (Walsh et al., 2002). Stompe and others (2004) reexamined the validity of the TCO concept from an exclusively psychopathological position, they compared in a retrospective design a sample of male offenders with schizophrenia not guilty by reason of insanity (n = 119) with a matched sample of nonoffending schizophrenia patients (n = 105). The finding found that taking into account the severity of offenses, TCO symptoms emerged as being associated with severe violence.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through TCO based on literature review is who having experience that people want to harm them and/or that they can not control their own thinking due to either the mind dominated by forces outside of their own control or that other people's thoughts were put into their heads.

21. Uncooperativeness, uncooperativeness means unwilling to cooperate (The free dictionary, 2010). In persons with schizophrenia, acts of violence have been associated with uncooperativenes. Arango and others (1999) evaluated several variables in the prediction of violence in 63 inpatients with a DSM-IV diagnosis of schizophrenia or schizoaffective disorder. The finding found that the general psychopathology scale revealed significant differences on items measuring uncooperativeness, violent patients scored higher on this item. Moreover, Fresan and others (2005) determined which temperament and character dimensions are predictors

of violent behavior in schizophrenia. The logistic regression only included two predictive variables for violent behavior in schizophrenia. These variables are: a) Novelty seeking, where patients with higher scores have a risk 6.12 times greater of being violent and b) cooperativeness, where lower scores meant a risk that was 11.07 times greater for being violent.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through uncooperativeness based on literature review is who unwilling to cooperate with other persons.

22. **Disorientation,** disorientation means a state of mental confusion characterized by inadequate or incorrect perceptions of place, time, or identity (Mosby's Medical Dictionary, 2009). Goldman and Foreman (2000) defined disorientation as 1) not oriented to time, i.e., not knowing what day, month, season, or year it is; 2) not oriented to place, i.e., not knowing the name of the building, the kind of building, or the city, state, or country in which one is presently located; or 3) not oriented to person, i.e., not knowing who one is.

Some studies have showed an association between disorientation and violent behavior in persons with schizophrenia (Arango et al., 1999; Fresan et al., 2005). For instance, Fresan and others (2005) investigated the relationship between violent behavior and psychiatric symptomatology in schizophrenic patients. The finding found that the association between violence and some items of the general psychopathology subscale, such as disorientation, unusual thought disorder and poor impulse control. Such symptomatic distinction makes it

possible to focus widely on several markers that could be used to increase the understanding of the schizophrenia and violence.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through disorientation based on literature review is who having a state of mental confusion characterized by inadequate or incorrect perceptions of place, time, person, or identity.

23. Medication noncompliance, medication compliance has similar meaning to medication adherence and these two terms are used interchangeable, although the definitions are difference. Compliance means the consistency and accuracy with which a patient follows the regimen prescribed by physician or other health professional (Stedmen's medical dictionary, 2000). Adherence means the extent to which a patient continues an agreed-upon model of treatment without close supervision, comparable with compliance and maintenance (Stedmen's medical dictionary, 2000). However, both terms refer to patient's ability and willingness to follow recommended treatment.

Noncompliance is the failure or refusal to comply: the failure or refusal to conform and adapt one's actions to a rule or to necessity. The term "noncompliance" is used in medicine particularly in regard to a patient not taking a prescribed medication or following a prescribed course of therapy. Medication noncompliance was defined as discontinuing medication without the recommendation of the treating physician (Ghaziuddin et al., 1999).

Medication compliance may be viewed as protective factors for violence. That is, without adequate treatment, risk factors associated with mental

illness (i.e., symptoms) or with life more generally (i.e., stress) are likely to lead to violence (Douglas and Skeem, 2005). Thus, medication noncompliance has been shown as a strong predictor of future violence (Bartels et al., 1991; Monahan et al., 2001; Schwartz et al., 1998).

In persons with schizophrenia, Bartels and others (1991) found that persons with schizophrenia who behaved violently had difficulties in several basic social areas, including psychosocial treatment adherence, medication compliance, and treatment alliance. Brekke and others (2001) examined the incidence and predictors of police contact, criminal charges, and victimization among noninstitutionalized persons with schizophrenia living in the community (N=172). The results showed that fewer days of taking medication at baseline (out of 180 days) was significant predictors of criminal charges. A retrospective study, Prapat Ukranan and Veeradech Veerapongset (1998) studied about psychotic patient and violent crime (N=283). The findings found that 78.8% of patients with a diagnosis of schizophrenia (n=223). Most of subjects were medication noncompliance. Ranee Chayintu and Nongluck Sattra (2000) studied in first offending and re-offending among forensic psychiatric patients and their correlates (N=323). The findings found that most of patients were diagnosed with psychosis (72.8%). Moreover, most of subjects were medication noncompliance (n=309, 95.7%). In qualitative study, Suphanee Sangrugsa (2003) studied in mental disorder and social factors among murdering Thai offenders (N=15). The results showed that most samples were murdering offenders with schizophrenia (n=7) and medication noncompliance. They stopped taking medicine in 1-5 months (n=7), 6 months - 3 years (n=3), and 3-7 days (n=2) before committed violence.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through medication noncompliance based on literature review is who discontinuing medication without the recommendation of the treating physician.

24. Substance abuse, substance abuse is the excessive use of a substance, alcohol or drug. A definition of substance abuse that is frequently cited is that in DSM-IV, the fourth edition, issued by the American Psychiatric Association (2000). The relationship between substance abuse and violent behavior is complex. Substance abuse may influence violent behavior through the disinhibition of behavioral controls or by directly initiating thoughts that lead to antisocial behavior. Violence may occur through the frustration experienced when a person's attempt to obtain or use substances is thwarted. Quelling the craving and desire associated with using various substances is a strong motivator, and hence a person may be more likely to act aggressively when they are prevented from acquiring substances (Douglas and Skeem, 2005). Thus, alcohol and other drug abuse is a risk factor for crime (Andrews and Bonta, 2006) and also is a risk factor for violence (Arseneault et al., 2000; Brennan et al., 2000; Mullen, 2006; Tengstrom, Hodgins, and Kullgren, 2001; Wallace, Mullen, and Burgess, 2004).

Substance abuse is almost by definition dynamic. That is, intoxication and use of substances ebb and flow relatively rapidly, even among heavy users. Furthermore, the relation was strongest shortly after alcohol consumption (i.e., 0–2 hr) and became progressively weaker with time. Mulvey (2004) found clear evidence that alcohol and drug use changed over time in a sample of high-risk

psychiatric patients, and that use of alcohol and drugs other than marijuana were predictive of violence 2–3 days later. Thus, there is some direct evidence that substance abuse is a dynamic risk factor for violence.

In persons with schizophrenia, epidemiological evidence in schizophrenia supports the strength of the correlation between substance abuse and violence (Large, Smith, and Nielssen, 2009; Monahan et al., 2001; Mullen et al., 2000; Soyka, 2000; Steele et al., 2003; Wallace et al., 2004; Weiss et al., 2006). The co-occurrence of schizophrenia and substance use is a significant and increasing problem (Blanchard et al., 2000). Most schizophrenic patients with substance use were violent behavior and most subjects were convicted of violence during the follow-up period (Hodgins et al., 1999; Hodgins, Tiihonen, and Ross, 2005; Munkner et al., 2003).

For instance, Swanson and others (2006) examined the prevalence and correlates of violence among schizophrenic patients living in the community by developing multivariable statistical models to assess the net effects of psychotic symptoms and other risk factors for minor (corresponding to simple assault without injury or weapon use) and serious violence (corresponding to any assault using a lethal weapon or resulting in injury, any threat with a lethal weapon in hand, or any sexual assault). The results showed that in bivariate analysis, substance abuse/dependence was associated with a highly significant 4-fold increase in the odds of serious violent behavior. Erkiran and others (2006) studied in substance abuse amplifies the risk for violence in schizophrenia spectrum disorder. The finding found that substance use disorder was also significant predictor of violence (OR=20.10, p<0.01 95% CI=5.03–80.27). In an unselected birth cohort (N=11,017), Rasanen and

others (1998) found that men with schizophrenia and comorbid alcohol abuse were 25 times more likely to commit violent offenses than men with no mental disorders and no alcohol problems. A retrospective study, Prapat Ukranan and Veeradech Veerapongset (1998) studied about psychotic patient and violent crime (N=283). The findings found that 78.8% of patients with a diagnosis of schizophrenia (n=223) and some of them were substance abuse at the time of committed violence crime.

In persons with schizophrenia, the most frequently abused substances are alcohol (Abushua'leh, and Abu-Akel, 2006; Eriksson, 2008; Erkiran et al., 2006; Fresan et al., 2005; Koen et al., 2004; Large et al., 2009; Weiss et al., 2006) and drug abuse (Abushua'leh, and Abu-Akel, 2006; Large et al., 2009; Ran et al., 2010; Walsh et al., 2004). Drug abuse are including amphetamine (Erkiran et al., 2006; Large et al., 2009), cannabis (Erkiran et al., 2006; Koen et al., 2004; Large et al., 2009), benzodiazepines, inhalants, opiates, stimulants (Erkiran et al., 2006).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through substance abuse based on the literature review including alcohol abuse and/or drug abuse (amphetamine, cannabis, benzodiazepines, inhalants, opiates, stimulants etc.).

25. Homeless, the U.S. Department of Housing and Urban Development (HUD) defines the term "homeless" or "homeless individual or homeless person" as (1) an individual who lacks a fixed, regular, and adequate nighttime residence; and (2) an individual who has a primary nighttime residence that is: A) supervised publicly or privately operated shelter designed to provide temporary living accommodations (including welfare hotels, congregate shelters, and transitional

housing for the mentally ill); B) an institution that provides a temporary residence for individuals intended to be institutionalized; or C) a public or private place not designed for, or ordinarily used as, a regular sleeping accommodations for human beings (Wikipedia Encyclopedia Dictionary, 2010). In social medicine defined homeless as a state of disenfranchisement, in which a person's lack a permanent residence, often living on the streets without protection from the environment and/or ready access to sanitation facilities (McGraw-Hill Concise Dictionary of Modern Medicine, 2002).

In Thailand, Boonlert Visetpricha defined homeless as a group of people who live without accommodation and live their lives in public space, footpath, under expressway etc. for more than three months. They are called "homeless" rather than "tramp" as they are usually referred (Boonlert Visetpricha, 2003).

The higher rate of homeless among schizophrenic patients may be due in part to fewer community resources for these patients, lack of health insurance, and poor family caring status (Ran et al., 2007; Ran, Chan, and Chen, 2009). Ran and others (2010) explored the prevalence and risk factors for self-reported criminal behavior among persons with schizophrenia in rural China. The rate of criminal behavior was 10.0% among persons with schizophrenia in a rural community during the follow-up period. Bivariate analyses showed that the risk of criminal behavior was significantly associated with homeless. Similarly with Modestin and Ammann (1996) investigated lifetime prevalence of criminal behavior in a population of male schizophrenia patients. The finding found that the stepwise

discriminant analysis yielded the homeless at index admission is the best discriminating between patients with and without criminal records.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through homeless based on literature review is who live without accommodation and live their lives in public space, footpath, under expressway etc. for more than three months.

26. Weapon availbility, if the environment into which a person is discharged offers access to weapons, the risk of violent behavior is significantly increased (Douglas and Webster, 1999; Silver, 2001). In persons with schizophrenia, Large and others (2009) conducted a systematic review and meta-analysis of population-based studies conducted in developed countries of homicide committed by persons diagnosed with schizophrenia. The findings found that the factors associated with high rates of violence in the community have a disproportionate effect on those with schizophrenia, either because of an interplay between aspects of the illness and substance use or weapon availability. In qualitative study, Suphanee Sangruksa (2003) studied in mental disorder and social factors among murdering offenders (N=15). The result showed that most samples were murdering offenders with schizophrenia (n=7) and having or carrying the weapon. Natthawut Arin (2004) studied in the commission of crime and criminal responsibility in forensic psychiatric offenders (N=34). The results showed that most subjects were diagnosed as schizophrenia (n=24, 70.6%). Moreover, most subjects were having weapon used for committed crime.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through weapon availability based on literature review is person who often uses weapons such as knife or gun to cause physical or psychological harm to others or routinely carry (although may not use) weapons as part of everyday life.

2.5.2 Circumstances related to violence among persons with schizophrenia in the community

In this study, circumstances which are the variables for violence among persons with schizophrenia in the community include poor peer relationships, poor family relationships, and expressed emotions in family.

1. Poor peer relationships, the quality of individuals' relationships influences violence, and is likely to wax and wane over time. Relationships may be conceptualized as proximate risk factors for violence or more general protective factors. Individuals are often violent toward those with whom they have relationships, including friends and family members (Monahan et al., 2001). Supportive friendships, negative social status among peers, and association with deviant peers might be expected to influence individual's exposure to violence.

In persons with schizophrenia, violence may be a consequence of his or her years' of experiences of hardship including experiences and feelings of wandering around his neighborhood and encountering with abusive peers, and experiences and feelings of being bullied and threatened by peers (Yip, 2005). Fresan and others (2004) examined the influence of premorbid adjustment on violent

behavior in schizophrenic patients (N=72). The results showed that violent schizophrenic patients showed the area of ''peer relationships'' was significantly diminished in several life period sections such as childhood, early and late adolescence in violent patients. Estroff and Zimmer (1994 cited in Douglas and Skeem, 2005) reported that patients who felt threatened by or perceived hostility among friends and others were more likely to threaten violence toward others.

From the literature review, poor peer relationships that associated with violence among persons with schizophrenia including experiences/feelings of wandering around his neighborhood (Yip, 2005), perceived hostility among friends (Estroff and Zimmer 1994 cited in Douglas and Skeem, 2005), experiences/feelings of being bullied and threatened by peers (Fresan et al., 2004; Vevera et al., 2005; Yip, 2005).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through poor peer relationships based on literature review including experiences/feelings of wandering around his neighborhood, having abusive peers, perceived hostility among friends, experiences/feelings of being bullied and threatened by peers.

2. Poor family relationships, family co-residence may affect violence in complex ways, either preventing or provoking violent behavior, depending on whether the family environment serves as a protective matrix or a stimulus for aggressive interactions. Living at home with the ostensible tangible support of family members could actually serve to elevate risk for violence if a person has a conflictual and stressful relationship with another person living there. Moreover, meager

opportunities; resource deprivation; physical deterioration; and the breakdown of micro institutions, especially the family are significantly raises the likelihood of violence and the likelihood predicted by individual risk factors (Swanson et al., 2006). On the other hand, this situation could decrease the odds of violence if there is no such conflict present. Several family circumstances have been shown to increase violence.

In persons with schizophrenia, Ran and others (2010) explored the prevalence and risk factors for self-reported criminal behavior among persons with schizophrenia in rural China. Bivariate analyses showed that the risk of criminal behavior was significantly associated with no family caregivers. In a sample of outpatients with schizophrenia, Klassen and O'Connor (1988a, 1988b, 1988c, 1989) found that lack of support from family members and spouse (feeling let down or dissatisfied with family, high levels of arguments with family) predicted violence. In qualitative study, Suphanee Sangrugsa (2003) studied in mental disorder and social factors among murdering Thai offenders (N=15). The result showed that most samples were murdering offenders with schizophrenia (n=7), having conflict in family, and poor parenting before committed violence crime. Natthawut Arin (2004) studied in the commission of crime and criminal responsibility in forensic psychiatric offenders (N=34). The results showed that most subjects were diagnosed as schizophrenia (n=24, 70.6%). Moreover, most subjects were poor family relationships (n=28, 82.4%).

Swanson and others (2006) examined the prevalence and correlates of violence among schizophrenia patients living in the community by developing multivariable statistical models to assess the net effects of psychotic

symptoms and other risk factors for minor (corresponding to simple assault without injury or weapon use) and serious violence (corresponding to any assault using a lethal weapon or resulting in injury, any threat with a lethal weapon in hand, or any sexual assault). The results showed that the final model shows minor violent behavior was significantly more likely among participants (N=1,115) with residing in restrictive housing and not feeling "listened to" by family members.

In summary, assessing violence risk of Thai persons with schizophrenia in the community through poor family relationships based on literature review including no family caregivers, lack of support from family members and spouse, having conflict in family, poor parenting, residing in restrictive housing, and not feeling "listened to" by family members.

3. Expressed emotions in family, expressed emotions (EE) means frequency and quality of negative emotions, e.g., anger or hostility, expressed by family members or significant others, that often lead to a high relapse rate, especially in schizophrenic patients (Medical Dictionary, 1998).

The three attitudes pertaining to negative EE are known as hostility, criticism, and emotional over-involvement. These attitudes of the family members determine the direction of the illness (Vaughn and Leff, 1976).

Hostility, the hostile attitudes of EE are negative toward the person with the disorder. The family members put blame on this person because of the disorder. The family members perceive the person as the one who is in control of the course of the illness. The patient is held accountable for any kind of negative incident that occurs within the family and is constantly blamed for the problems of the family.

They have a hard time problem solving within the family because the answer to most problems is settled with the disorder being the cause (Brewin et al., 1991).

Criticism, the critical attitudes of EE are combinations of hostile and emotional over-involvement. The family members are more open to view other aspects that contribute to the mental illness and the behavior. These attitudes are more open minded than the previous because they view more than one cause of the disorder (Brewin et al., 1991). However, there is still negative criticism even though other contributions are viewed and accepted by the family members. Critical EE from family members are the cause of future and increasing problems for the patient (Bullock, Bank, and Buraston, 2002), especially psychotic relapse and violent behavior.

Emotional Over-Involvement (EOI), contrarily, family members may express their opinion on the mental illness with emotional over-involvement. The family members blame themselves for everything instead of the patient. They feel that everything is their fault and become over involved with the one who has the illness (Lopez et al., 2004).

In persons with schizophrenia, EE by family members (marked by critical, hostile, and/or emotionally over-involved attitudes during a clinical interview) is now widely recognized as a reliable predictor of poor prognosis (Butzlaff and Hooley, 1998) and increased violence. The family members influence the outcome of the disorder through negative comments and nonverbal actions. The patients are feeling of belonging needs to be very strong because of the fear of being rejected. These feelings start to take over some people's lives, most damagingly in their home, where they should feel the most comfortable (Lopez et al., 2004).

Ranee Chayintu and Nongluck Sattra (2000) studied in first offending and re-offending among forensic psychiatric patients and their correlates (N=323). The findings found that most of patients were diagnosed with psychosis (72.8%). Most of subjects were having EE in family that related to increased offending. In qualitative study, Suphanee Sangruksa (2003) studied in mental disorder and social factors among murdering offenders (N=15). The result showed that most samples were murdering offenders with schizophrenia (n=7) and having EE in family.

In assessing EE, thus, the main focus of assessment of EE should be the patients' perceptions of their caregivers' comments and emotional expressions, and the resulting psychological impacts on the patients, rather than interviewing the caregivers to elicit comments on the patient's behavior (Hooley and Teasdale, 1989).

In summary, assessing violence risk of Thai persons with schizophrenia in the community through EE in family based on literature review including perceived hostility, criticism, and emotional over-involvement of family members.

The studies reviewed in this paper concur in supporting the assumption that there is a significant association between persons with schizophrenia and violence risk. There is no unambiguous evidence of an increase of violence committed by persons with schizophrenia in particular during in the community. Moreover, violence risk in persons with schizophrenia in the community probably results from multiple characteristics and circumstances that associated with violence.

Therefore, assessing violence risk of Thai persons with schizophrenia in the community through characteristics and circumstances that associated with violence as described above is the way that prevented violence before it begins. That is, violence risk assessment can help mental health nurse to identify characteristics and circumstances for violence and evaluate probability of violence. Probability is concerned with the chances of violence being repeated and typically actuarial methods are used to evaluate probability (Kumar and Simpson, 2005).

3. Nursing practice in person with schizophrenia in the community

3.1 Nurse and nursing intervention for persons with schizophrenia in the community

In the community, mental health nurses belong to the discipline most often identified as a care program. This relatively new role has significant implications for the role holder in relation to the assessment, communication, and management of violence risk. Clearly, the knowledge, skills, and experience that mental health nurses possess are crucial to clinical interventions involved in the process of assessing and managing violence risk. Thus, mental health nurses are confronted with the complexity of helping the patients, and of maintaining their civil rights, liberties, and autonomy. It is clear that the role of mental health nurses is pivotal in the assessment and management of violence risk among persons with schizophrenia in the community, not only because their family members are often the target of such violence, but also because of the need to maintain public safety.

Consequently, violence risk is the optimal goal of nursing interventions. Thailand does not have a reliable or valid instrument to identify

violence risk for persons with schizophrenia in the community who need help, nor do they have a standard violence risk assessment for persons with schizophrenia in the community that can evaluate the effect of nursing interventions aimed at preventing and decreasing violent behavior in persons with schizophrenia in the community. The identification of violence risk by the violence risk assessment scale thus will improve the effectiveness of the treatments and services provided to persons with schizophrenia in the community and hopefully lower the rate of recidivism. This in turn will reduce the numbers of persons with schizophrenia in the community moving from general psychiatry into forensic psychiatry. Moreover, violent behavior and violent recidivism among persons with schizophrenia in the community may be successfully reduced.

3.2 Violence risk assessment among persons with schizophrenia in the community

Recently, although there are many ways, such as drug treatment and management of violence program, to prevent violence among persons with schizophrenia, primary violence prevention is violence risk assessment.

Risk assessment is becoming an increasingly important aspect of clinical and casework practice with all client groups including persons with schizophrenia in the community. The term 'risk assessment' is now used in many contexts and may be inappropriately extrapolated from one context to another. Risk assessment is a combination of an estimate of the probability of a target behavior occurring with a consideration of the consequences of such occurrences (Towl and Crighton, 1996: 55). In mental health practice, risk assessment has three main

concerns: risk of violence, dangerousness, and risk of recidivism (Mason, 1998 cited in Kettles, 2004). So, risk assessment is defined as 'any negative outcome that could be prevented, predicted or from which liability could ensue'. Such outcomes include recidivism, violence of any kind (including violence toward others and self), or abuse (physical, sexual or exploitation of any kind) (Samuels, O'Driscoll, and Bazaley, 2005).

In violence risk assessment, Hart (1998) provided the definition of violence risk assessment as the process of evaluating individuals to (1) characterize the likelihood they will commit acts of violence and (2) develop interventions to manage or reduce that likelihood.

Violence risk assessment aims to assess whether or not a patient is a risk to themselves or to others in terms of dangerousness and recidivism in the part, now or in the future (Kettles, 2004). Violence risk assessment has become the focus of much activity but the field of violence risk assessment has been shown to be diverse, lacking standardization, and with a need for a stronger research basis and consequently stronger reliability and validity (Kettles et al., 2003; MacCall, 2003).

Therefore, mental health nurses are concerned with the clinical reality of assessing and managing violence risk rather than the research task of prediction. There are now several approaches to violence risk and its assessment such as clinical approach, actuarial approach, and structured clinical judgment approach. Within each of these approaches there are many different approaches attempt to help the mental health nurses in identifying past, present and future risk of violence.

1. Clinical approach

In mental health services, clinical decisions on risk are made at all stages of patient care, so violence risk assessment and management are key components of clinical practice. Historically, the most common approach to assessment was unstructured clinical or professional judgment. This has a human clinical judge who makes decisions after interview with the patient based on their personal impression of an individual (Dolan and Doyle, 2000; Doyle and Dolan, 2004). This helps to identify the use that violence risk has and how it has changed over time (Kettles, 2004). The clinical approach has been criticized for being unstructured, informal, subjective, impressionistic, and inaccurate (Doyle and Dolan, 2004; Grove and Meehl 1996). Moreover, this approach is plagued by various sources of bias and error as information is highly dependent upon interviewing, observation and self-report (Kemshall, 1996).

2. Actuarial approach

The actuarial approach to violence risk assessment is typified by assessors reaching judgments based on statistical information according to fixed and explicit rules. This approach is to compile a checklist of a number of predictors or factors, each of which is allotted a score. The sum of the risk factors is an 'actuarial' graduated probability measure, representing the amount of risk attributed to the individual (Hart, 1998; Kraemer et al. 1997). Although actuarial approaches to violence prediction have been found to be more accurate than unstructured clinical approaches, there are limitations. Actuarial approaches tend to focus the assessment on a limited range of characteristics, thus ignoring potentially crucial case-specific

factors. There is also a tendency to focus on static factors (such as age, gender, past behavior, age at first violence) that are immutable, change little, and so in principle not amenable to clinical intervention (Doyle, and Dolan, 2004; Doyle and Dolan, 2002;' Hart, 1998).

3. Structured clinical judgment approach

Both clinical and actuarial approaches have definite advantages and disadvantages. The debate as to which approach is most relevant to clinical practice is complex. However, it would appear that a combination of the clinical and actuarial approach is warranted. Such an alternative structured decision making or structured clinical judgment (Hart, 1998), attempts to bridge the gap between the actuarial approach and the clinical approach of violence risk assessment. This approach recognizes the reality that the process of clinical risk assessment is a dynamic and continuous process that is mediated by changing conditions (Doyle and Dolan, 2002). Thus, this approach as it specifically: 1) offers a more objective and interpretable means of comparing intervention results; 2) is norm-based; 3) enhances the communication possibilities between wards and clinics; 4) offers process data for comparison with recidivism data; 5) is supportive to rehabilitation planning; 6) provides baseline and re-measurement data; 7) offers repetitive evaluation of specific treatment goals therefore effectiveness of treatment; 8) provides an overall treatment effect related to the developments of a multitude of behaviors; and 9) enables clinical audit of implementation, standardized assessment, systematic decisions, more focused treatment, is patient-focused, has health indicators and challenges outdated models (Kettles, 2004).

4. Violence risk assessment scale

4.1 Generation of violence risk assessment scales

Over the years, the method to assess and predict violence risks has evolved, producing a number of generations of violence risk assessment scales. First-generation violence risk assessment tools rely on nothing more than unstructured professional opinions that may vary with each assessor's training, background, and experience (Wong and Gordon, 2006). These scales are based on clinical approach that was many shortcomings as described in clinical approach.

Second-generation violence risk assessment scales were characterized by short-term predictions, a focus on situational variables, and special populations (Heilbrun, Ogloff, and Picarello, 1999) and use tools with essentially static predictors or fixed risk markers (Kraemer et al., 1997) such as the Violence Risk Appraisal Guide (VRAG; Quinsey, et al., 1998 cited in Wong and Gordon, 2006) and Offender Group Reconviction Scale (OGRS; Copas and Marshall, 1998 cited in Wong and Gordon, 2006). However, they have major shortcomings. These scales with mostly static or historical variables cannot assess changes in risk (Kraemer et al., 1997). Moreover, the results of risk assessments using such scales tell the assessor very little about the client's problem areas, treatment potential, criminogenic needs, strengths, current functioning, and so on. Although second-generation scales may be more prediction friendly, they are not treatment friendly (Wong and Gordon, 2006).

Third-generation violence risk assessment scales used dynamic or changeable variables such as criminal attitudes and associates and, in some cases, are theory based such as the Level of Service Inventory—Revised (LSI–R; Andrews and

Bonta, 1995 cited in Wong and Gordon, 2006), the Problem Identification Checklist Scales (PICS, Quinsey et al., 1997), and Historical, Clinical and Risk Management– 20 Item (HCR-20; Webster et al., 1997 cited in Wong and Gordon, 2006). This approach is based on objective assessment by trained people with appropriate expertise and which supports a multidisciplinary approach. Most of the shortcomings of these scales are designed primarily for the assessment of general criminality. Dynamic variables can predict risk just as well as static variables (Wong and Gordon, 2006).

Fourth-generation violence risk assessment scales were to fulfill specialized functions such as the assessment and management of mental disordered offenders and offenders and, especially, the treatment of violence, including sexual violence such as the Level of Service/Case Management Inventory (LS/CMI; Andrews, Bonta, and Wormith, 2004 cited in Andrews and Bonta, 2006) was cited as an example of a fourth-generation offender management scale. The LS/CMI is, by and large, an offender information management and service delivery system that guides and monitors service delivery to and supervision of offenders (including risk assessment) from intake to case closure (Andrews and Bonta, 2006). A major goal of such systems is to strengthen adherence with principles of effective intervention (e.g., case classification, level of supervision, general service requirements) in order to enhance public safety (Andrews, Bonta, and Wormith, 2006). Rather than duplicating one another and to reduce the proliferation of risk scales, fourth-generation scales were designed to serve different and specialized functions. For example, system scales are appropriate to guide the delivery of general offender treatment services and for offender management and monitoring. Moreover, specialized scales are more

appropriate for special need populations such as the Violence Risk Scale (VRS, Wong and Gordon, 2006).

4.2 Violence risk assessment scales

Various instruments have shown promise in improving assessment and predictive accuracy in mental health services. They were developed by other disciplines from the west (Table 1).

1. Dangerous Behaviour Rating Scale (DBRS) by Menzies and others in 1985 and revised in 1994. The DBRS measured the facilitate predictions of dangerousness among pretrial forensic patients based on consultations with clinical practitioners, from a model originally devised by Megargee in 1976. The item list comprised 18 ratings of personality, situation, lifestyle-related variables, and interview-specific factors possibly associated with risk potential, encompassing 11 personality factors, 2 situational factors, and 5 lifestyle-related variables and interview specific factors. The DBRS has been shown low inter-rater Pearson correlation of .22 (Menzies et al., 1994). Reports on the predictive validity of the DBRS, indicate that it has met with little success (Menzies and Webster's, 1995). The exclusive use of a single predictive instrument precluded the possibility that alternative measures, or even global clinical judgments, might render more accurate dangerousness predictions than those generated in the initial study (Menzies et al., 1994).

2. Psychopathy Checklist–Revised (PCL-R) was developed by Hare in 1991. It is similar to the actuarial measures. So, it is most often seen as a static variable (Miller, 2006). The PCL-R is a clinical tool for diagnosing psychopathy consists of 20 items that are scored 0, 1 or 2 based upon a clinical interview and

review of file information. Total scores can range from 0 to 40, and scores of 30 or more are considered diagnostic of psychopathy. Although not originally developed as a risk assessment instrument, two meta-analyses have demonstrated that the PCL–R is a strong predictor of violent recidivism (Hemphill, Hare, and Wong, 1998; Salekin, Rogers, and Sewell, 1996). The PCL-R has excellent psychometric properties in terms of inter-rater reliability, internal consistency and test-retest reliability (Langstom & Grann, 2002). The PCL–R was not intended as a risk assessment tool but is often used for this because of its predictive accuracy for all types of offending (Hare, 1991 cited in Langstom & Grann, 2002). The PCL is not truly actuarial risk assessment *per se*, it similar to the actuarial measures. However, it is most often seen as a static variable for assess future violence (Miller, 2006).

3. Psychopathy Checklist: Screening Version (PCL:SV) by Hart and others in 1995. It needed to be conceptually and empirically related to the PCL-R, psychometrically sound, based on a symptom construct scale, sensitive to non-forensic samples and shorter than the PCL-R. The PCL:SV specifically was designed to assess for psychopathy in noncriminal samples, given that criminal records often are unavailable or irrelevant in such settings. The PCL:SV has 12 items, each scored from 0 to 2 (range of scores = 0–24). The PCL:SV has two factors. Factor 1 measures selfish and callous personality and relates mainly to interpersonal and affective traits. Factor 2 measures socially deviant behavior and past criminality. It is not an instrument for criminal predictions *per se*, but it has often been shown to be predictive for persistent delinquency and future violence.

4. Violence Risk Appraisal Guide (VRAG) was developed by Harris and others in 1993. The VRAG is a 12-item actuarial instrument developed from files

of male criminal offenders and forensic patients with attributed integer weights, ranging from –5 to -12. Each item was then given a weighting of 1 or -1 for every +5% difference from the mean recidivism rate of 31%. The total scores of the VRAG is range from -26 to 38, with higher scores reflecting a greater propensity of violent reoffending.

5. Historical, Clinical and Risk Management–20 Item (HCR-20) was developed by Webster and others in 1995 and revised in 1997. The HCR-20 is a structured risk assessment guide and composite of 20 risk factors for future violence in adult offenders with a violent history and/or a major mental disorder or personality disorder. The instrument is divided into three subscales with 10 historical items relating to past, relatively stable risk factors for violence; 5 clinical items reflecting current, dynamic correlates of violence that are thought to be changeable; and 5 risk-management items focusing on situational factors that might aggravate or mitigate risk (Douglas and Webster, 1999). The HCR-20 showed good predictive accuracy in civil and forensic settings. Moreover, items can be omitted if there is not enough information available for coding, with the total score being prorated according to the total number of items.

6. The Problem Identification Checklist Scales (PICS) by Quinsey and others in 1997. Data on 110 mentally disordered offenders were used to refine and examine the utility of the scale. The rationally derived PICS consists of 67 items that tap six problem areas (psychotic behaviors, skill deficits, procriminal behavior, mood problems, social withdrawal, and other rehabilitation obstacles) and four proximal indicators (dynamic antisociality, psychiatric symptoms, poor compliance, poor medication compliance/dysphoria).

7. Offender Group Reconviction Scale (OGRS) was developed by Copas and Marshall in 1998. The OGRS is a criminogenic actuarial instrument based solely on history of offending and certain demographic variables. The OGRS estimates the probability that offenders will be reconvicted of any offense within 2 years of release on the basis of nine variables (e.g., age, gender, current and previous offenses, rate of conviction, etc.). It does not use clinical judgment, and estimates of reliability are not necessary as all ratings are computer generated. The OGRS score cannot be calculated for people who do not have previous convictions and does not include any assessment or weighting of mental health variables (Gray et al., 2004). The OGRS is the best predictor of re-offending in general population. The OGRS, moreover, was designed so that untrained, non-clinical personnel can code them quickly and easily so that risk evaluation can be cheap, efficient, and not dependent on clinical judgment with possible associated error and bias.

8. Level of Service Inventory–Revised (LSI-R) was developed base on Psychology of criminal conduct (PCC) theory by Andrews and Bonta in 1995. The LSI-R is an instrument for risk/needs assessment with 54 items related to ten different risk areas. It was selected as a measure of general risk of re-offence as it appeared in multiple international comparative studies as one of the best predictors.

9. Violence Risk Scale (VRS) was developed by Wong and Gordon in 2000. Violence Risk Scale is a scale specifically designed to assess the risk of violent recidivism in forensic patients. The theoretical basis of the VRS is predicated on the PCC. The VRS consists of six static or historical factors and 20 dynamic or changeable factors. Each item is rated on a four-point scale (0–3) against descriptive criteria. It has been used effectively to evaluate the effect of treatment on risk in a

violence-prevention program in Canada and the authors report that research indicates that the VRS has demonstrated strong predictive validity for violent recidivism over a 2-year follow-up period. The VRS was designed to integrate the assessment of risk, need, responsivity and treatment change into a single tool. It assesses the clients' level of violence risk, identifies treatment targets linked to violence, assesses the clients' readiness for change and their posttreatment improvements on the treatment targets. Treatment improvement or lack thereof is linked to quantitative changes in violence risk (Wong, Gordon, & Gu, 2007).

10. Strucured Outcome Assessment and Community Risk Monitoring (SORM) was developed by Grann, and others in 2005. The aim of SORM is to assess recidivism in outpatient settings of forensic psychiatric patients and mentally disordered offenders who were discharged to the community. The 30 items of the SORM emanate from the conceptualizations produced in the pilot study from a specific individual or contextual factor and outcome evaluation of 23 former patients from a maximum security forensic psychiatric hospital. The SORM was intended for use with former forensic mental health clients and with clients in forensic mental health who have been released from institutional settings into the community on a conditional leave basis and are still subject to aftercare.

11. The Inventory of Offender Risk, Needs, and Strengths (IORNS) was developed by Miller in 2006. The IORNS is a true/false self-report measure for the assessment of risk, dynamic needs, and protective strengths. The main goals of the IORNS development project were twofold. The first goal was to construct a time-efficient and easily administered measure of variables related to criminal behavior, recidivism, and crime desistance. The second goal was to develop a comprehensive

measure containing indexes, scales, and subscales for specificity in interpretation such that utility for offender risk assessment, treatment, and management would be achieved. The 130-item measure provides four indexes, the Static risk index (SRI; 12 items), the Dynamic Need Index (DNI; 79 items), the Protective Strength Index (PSI; 26 items); the Favorable Impression (FIM; 13 items) (Miller, 2006).

12. The Dynamic Risk Assessment and Management System (DRAMS) was developed by Lindsay and others in 2004. The DRAMS is an assessment for dynamic/proximal risk factors in offenders with intellectual disabilities from the literature on proximal/ dynamic risk. The DRAMS composes of mood, antisocial behavior, thoughts, psychotic symptoms, self-regulation, therapeutic alliance, compliance with routine, substance abuse, therapeutic alliance, and opportunity for victim access. 29 items, each of these items is arranged along a continuum from no problem to extreme problem.

13. Violence Screening Checklist (VSC) was developed by McNiel and others in 1988. The VSC consists of five items that had been identified in a previous study of statistical prediction of violence among 238 civilly committed psychiatric inpatients. The VSC was validated with a new sample of 338 patients by McNiel and Binder in 1994a. The items are worded so that a positive answer to each question increases the likelihood of violence (scored as a 1) and a negative answer is scored as a 0. The revised version, the Violence Screening Checklist-Revised (VSC–R), consists of the first four items from the first version (McNiel et al., 2003).

14. Broset violence checklist (BVC) was developed by Almvik and Woods in 1998. The BVC is a short-term violence prediction instrument for inpatient violence. The BVC, 6 items, is assessing confusion, irritability, boisterousness, verbal threats, physical threats and attacks on objects as either present or absent. Each of the

six items on the BVC is scored for their presence (1) or absence (0). The sum of scores is then totalled. Interpretation of the scoring is given as follows: a sum of 0 suggests that the risk of violence is small; scores of 1 and 2 suggest that the risk of violence is moderate and preventive measures should be taken; and scores of 3 and more indicate that the risk of violence is very high, immediate preventive measures are required and plans for handling an attack should be activated (Woods and Almvik, 2002).

15. The Modified Overt Aggression Scale (MOAS) was modified by Kay and others 1988, originally the Overt Aggression Scale (OAS) by Yudofsky and others in 1986. The MOAS is a measure of change in levels of aggression among people with mental disorders. The MOAS rates the most severe act in four categories: verbal aggression, aggression against objects, aggression against self, and aggression against other people. A score from 0 to 4 is assigned to each act: 0 scores indicate increasing severity. The score in each category is multiplied by a factor assigned to that category: 1 for verbal aggression, 2 for aggression against objects, 3 for aggression against self, and 4 for aggression against other people. Thus, the total score ranges from 0 to 40 (Suris et al. 2004).

Table 1 Violence risk assessment scales

Scale	Purposes	Framework	Component/Description	Validity/Reliability	Weakness
The Dangerous Behaviour Rating Scale (DBRS) version 2 by Menzies and others in 1994	To facilitate predictions of dangerousness among pretrial forensic patients.	Based on consultations with clinical practitioners, from a model originally devised by Megargee (1976).	- **Components:** personality, situation, lifestyle-related variables and interview - specific factors - The 18 items, using 7-point likert scale items (from "extremely low" to "extremely high").	- Inter-rater pearson correlation of .22 (Menzies et al., 1994).	- The DBRS is now rarely used because of the limitations of this instrument reflect the limited literature on which it was based (Dolan and Doyle, 2000).
Psychopathy Checklist–Revised (PCL-R) by Hare in 1991	- Initially, this checklist was developed as a psychometric measure of a specific form of personality disorder.	- The PCL-R was derived from a factor analysis of characteristics and historical criminal versatility based on the clinical conception of psychopathy detailed in Cleckley's (1976).	- **Components:** Emotional Detachment (factor 1) and Antisocial Lifestyle (factor 2). - The PCL-R is a clinical tool for diagnosing psychopathy consists of 20 items. Each item is scored on a three-point scale: 0='item does not apply'; 1='item applies somewhat'; 2='item definitely applies'. Total scores can range from 0 to 40, and scores of 30 or more are considered diagnostic of psychopathy. - Semi-structure interview, a clinical interview, reviews of file information case-history information were used to collecting data.	- ICCs of 0.88 for Factor 1, 0.99 for Factor 2, and 0.95 for PCL-R total score (Warren, and et al., 2005). - Cronbach's alpha of the total score were α=.71 (Dahle, 2006). - Predictive validity: AUC =.64 (Harris and Lurigio, 2007).	- Time consuming procedure which precludes routine clinical use because on a careful clinical interview, reviews of file information, and case-history information.

Table 1 (Continued)

Scale	Purposes	Framework	Component/Description	Validity/Reliability	Weakness
Psychopathy Checklist: Screening Version (PCL:SV) by Hart and others in 1995	The PCL:SV specifically was designed to assess for psychopathy in noncriminal samples and to screen for psychopathy in offender populations.	Psychopathy based on a symptom construct scale, sensitive to non-forensic samples.	**- Components:** Factor 1 measures selfish and callous personality and relates mainly to interpersonal and affective traits. Factor 2 measures socially deviant behavior and past criminality. **-** The 12 items with semi-structured interview, each PCL:SV item is scored on a 3-point scale, ranging from 2 (*item is consistent with the individual's behavior*) through 1 (*item applies in some respects*) to 0 (*item is not descriptive of the individual at all*) (range of scores = 0–24). **-** Semi-structure interview, a clinical interview, reviews of file information case-history information were used to collecting data.	**-** ICCs = .84, .81, and .75, respectively, for total score, Part 1, and Part 2 and Cronbach's α= .84 (Vitacco, Neumann, and Jackson, 2005). - Concurrent validity, the PCL:SV had high correlations with the PCL–R (*r* = .80) (Monahan et al., 2000). - Predictive validity: AUC =.68 (Yang, Wong, and Coid, 2010).	**-** Time consuming procedure which precludes routine clinical use because on **a** careful file review and a semi-structured interview**.**
Violence Risk Appraisal Guide (VRAG) by Webster and others in 1994	To predict violent recidivism in offender populations between violent recidivists and non recidivists.	The VRAG was developed from file information about 618 men who had committed a serious or violent offence and who had an opportunity to re-offend.	**- Components:** demographic information, criminal history, psychiatric history and childhood history. **-** The VRAG is a 12-item. Each item was then given a weighting of 1 or -1 for every +5% difference from the mean recidivism rate of 31%. The total score of the VRAG ranges from -26 to 38, with higher scores reflecting a greater propensity of violent re-offending.	**-** Interrater correlations are above .80 and kappas are above .70 (Webster et al., 1994 cited in Dolan and Doyle, 2000)**.** **-** Predictive validity: AUC =.70 (Harris and Lurigio, 2007) and AUCs of 0.75, 0.74 and 0.74 for 3.5, 6 and 10 years, respectively (Rice and Harris, 1995).	**-** The VRAG with mostly static or historical variables cannot assess changes in risk (Kraemer et al., 1997).

Table 1 (Continued)

Scale	Purposes	Framework	Component/Description	Validity/Reliability	Weakness
Historical, Clinical and Risk Management–20 Item (HCR-20) version 2 by Webster and others in 1997	To predict future risk of violence in mentally disordered offenders, general offenders, and forensic patients.	- An extensive review of the literature.	- **Components:**: historical, clinical and risk management variables. - A 20-item clinical interview, Each item is coded on a 3-point scale, with a range of 0 (*available information contraindicates the presence of the item*), 1 (*available information suggests the possible presence of the item*), and 2 (*available information indicates the presence of the item*). That is, items are considered (separately and collectively), and a risk estimate of low, moderate, or high is made by the professional.. The risk score is calculated with a range of 0–40. - A semi-structured interview and file review were used to collecting data.	- The inter-rater reliability total: $r = .80$; History subscale: $r = .92$; Clinical subscale: $r = .90$; Risk Management subscale: $r = .85$ (Gray et al., 2004). - Predictive validity: AUC =.71 (Yang, Wong, and Coid, 2010).	**-** Time consuming procedure which precludes routine clinical use because on a careful file review and a semi-structured interview**.** - It already enjoin consideration of dynamic factors as part of the instrument. The impact of treatment on dynamic factors and consequently recidivism is not yet clear (Miller et al., 2005).
The Problem Identification Checklist Scales (PICS) by Quinsey and others in 1997	To predict re-offending in mentally disordered offenders.	Data on 110 mentally disordered offenders were used to refine and examine the utility of the scale.	- **Components:** six problem areas (psychotic behaviors, skill deficits, procriminal behavior, mood problems, social withdrawal, and other rehabilitation obstacles) and four proximal indicators (dynamic antisociality, psychiatric symptoms, poor compliance, poor medication compliance/dysphoria). - The 67 items, these items were scored based on a record review of the offender's state 6 months prior (problem areas) and 1 month prior (proximal indicators) to the index or control event (violent offending).	No testing	- The PICS scores change over time and predict proximal violence (Douglas and Skeem, 2005).

Table 1 (Continued)

Scale	Purposes	Framework	Component/Description	Validity/Reliability	Weakness
Level of Service Inventory – Revised (LSI-R) by Andrews and Bonta in 1995	The LSI-R is an instrument for risk/needs assessment	Psychology of criminal conduct (PCC)	**- Components:** criminal history, companions, attitudes/orientation, and emotional/personal. **-** A 54-item, each scored in a zero-one format and distributed across 10 subcomponents	- Cronbach's alpha were α=.84. ICC=.93 (Dahle, 2006). - Predictive validity: AUC =.65 (Yang, Wong, and Coid, 2010).	An assessment tool commonly used in correctional settings.
Violence Risk Scale (VRS) by Wong and Gordon in 2000	To assess the risk of violent recidivism and risk management in mentally disordered offenders who have completed treatment and are being considered for release.	Psychology of criminal conduct (PCC) theory (Andrews and Bonta, 2003)	**- Components:** antisocial attitudes, antisocial associates, antisocial behavioral history, antisocial personality, and problematic conditions in the domains of home, school, work, and leisure - A 26-item, each item is rated on a four-point scale (0–3). The total VRS score indicate the level of violence risk; the higher the score, the higher the risk. - Semi-structured interview and file review were used to collecting data.	- The Cronbach alpha coefficients for the VRS total, dynamic item total, and static item total were .93, .94, and .69, respectively (Wong and Gordon, 2000 cited in Wong and Gordon, 2006). **-** The predictive validity for violent recidivism over a 2-year follow-up period, AUC = .81; r= .46, the VRS scores were significantly associated with violent recidivism (r = .26) (Douglas and Skeem, 2005).	- The static variables lack unidimensionality; three of the six static variables were loaded on Factors 1 and 3, and this may account for the low alpha (internal consistency) of the static variables (Wong and Gordon, 2000 cited in Wong and Gordon, 2006). **-** Time consuming procedure which precludes routine clinical use because on a careful file review and a semi-structured interview.

Table 1 (Continued)

Scale	Purposes	Framework	Component/Description	Validity/Reliability	Weakness
Strucured Outcome Assessment and Community Risk Monitoring (SORM) by Grann and others in 2005	- The aim of SORM is designed for assessment and risk monitoring in outpatient settings of forensic psychiatric patients and mentally disordered offenders who are discharge to the community.	Pilot study to explore a specific individual or contextual factor and outcome empirically among 23 former patients from a maximum security forensic psychiatric hospital.	- **Components:** contextual risk factors including current services and interventions, social situation, social network, clinical factors, and subjective ratings - The 30 items, each item is rated for presence or absence of a specific individual or contextual factor. A four-point scale (No/A/B/C) format is used.	- Cohen's Kappa, was on average k = 0.88 and ranged from 0.32 to 1.00 (median=1, mode=1) (Grann et al., 2005). - The predictive validity, for violent incidents, AUC was 0.71. For other criminal acts, AUC was 0.67. For risk situations, AUC was 0.65 (Grann et al., 2005).	Time consuming procedure which precludes routine clinical use because on a careful file review and a semi-structured interview.
The Inventory of Offender Risk, Needs, and Strengths (IORNS) by Miller in 2006	To measure of variables related to criminal behavior, recidivism, and crime desistance	Several constructs were identified in the literature that significantly related to general, violent, and sexual criminal behavior (Miller, 2006).	- **Components:** The Static risk index (SRI; 12 items), The Dynamic Need Index (DNI; 79 items), The Protective Strength Index (PSI; 26 items); The Favorable Impression (FIM; 13 items) - The 130-item measure provides four indexes, six dynamic needs scales, two protective strength scales, and several subscales for detailed scale interpretation. - A true/false self-report measure for the assessment of risk, dynamic needs, and protective strengths.	- The reliability (a =.51-.91 (Miller, 2006).	- The IORNS validity results are promising, they are limited in generalizability (Miller, 2006).

Table 1 (Continued)

Scale	Purposes	Framework	Component/Description	Validity/Reliability	Weakness
The Dynamic Risk Assessment and Management System (DRAMS) by Lindsay and others in 2004	An assessment for dynamic/proximal risk factors in offenders with intellectual disabilities.	From the literature on proximal/ dynamic risk.	- **Components:** mood, antisocial behaviour, thoughts, psychotic symptoms, self-regulation, therapeutic alliance, and compliance with routine - 7 items, each of these items is arranged along a continuum from no problem to extreme problem.	- Internal consistency reliability, total r = .45 (Lindsay et al., 2004). - Indeed, Cohen's Alpha co-efficient ($a = 0.58$) (Lindsay et al., 2004).	- The DRAMS is not designed to be a coherent, unified dynamic risk assessment. It simply takes the available variables and sets them out in a usable fashion. Therefore, there is no strong expectation that it is measuring a single concept.
Violence Screening Checklist (VSC) by McNiel and others in 1988	Predicting violence	Based on a previous study of statistical prediction of violence among civilly committed patients	- **Components:** The items include the following: (a) history of physical attacks and/or fear-inducing behavior during the 2 weeks before hospital admission, (b) absence of recent suicidal behavior (this item is checked if the patient has *not* shown recent suicidal behavior), (c) schizophrenic or manic diagnosis, (d) male gender, and (e) currently married or cohabiting. - The items are worded so that a positive answer to each question increases the likelihood of violence (scored as a 1) and a negative answer is scored as a 0.	In a general inpatient population, scores on the tool had a sensitivity of .55, specificity of .64, false-positive rate of .68, false-negative rate of .18, positive predictive value of .41, negative predictive value of .82, and total predictive value of .61 (McNiel and Binder, 1994a).	The VSC does not include any assessment of characteristics and circumstances variables for violence risk among persons with schizophrenia.

Table 1 (Continued)

Scale	Purposes	Framework	Component/Description	Validity/Reliability	Weakness
Broset violence checklist (BVC) was developed by Almvik and Woods in 1998	To predicting short-term inpatient violence within the next 24-h period.	- The BVC was developed based on the empirical work of Linaker and Busch-Iversen in 1995.	**- Components:** the BVC composed of 6 items including confusion, irritability, boisterousness, verbal threats, physical threats and attacks on objects. **-** Each of the six items on the BVC is scored for their presence (1) or absence (0). The sum of scores is then totalled. A sum of 0 suggests that the risk of violence is small; scores of 1 and 2 suggest that the risk of violence is moderate and preventive measures should be taken; and scores of 3 and more indicate that the risk of violence is very high, immediate preventive measures are required and plans for handling an attack should be activated.	- Sensitivity was 0.63 and specificity was 0.92. The AUC was 0.82, SE=0.04, 95% CI 0.75-0.89, p<.001, and kappa=0.44. Overall the results are reported to indicate that a score of 2 or more predicts a violent event in the next 24-h period (Almvik, Woods, and Rasmussen, 2000).	The BVC does not include any assessment of characteristics and circumstances variables for violence among persons with schizophrenia in the community.
Modified Overt Aggression Scale (MOAS) was developed by Kay and others 1988	To assess aggression in mental illness.	Based on literature review	**- Components:** verbal aggression, aggression against objects, aggression against self, and aggression against other people. **-** A score from 0 to 4 is assigned to each act: 0 scores indicate increasing severity. The score in each category is multiplied by a factor assigned to that category: 1 for verbal aggression, 2 for aggression against objects, 3 for aggression against self, and 4 for aggression against other people. Thus, the total score ranges from 0 to 40.	- test–retest reliability (α= 0.75). - Discriminate validity during 1-week period was 71.9% (Kay, Wolkenfield, and Murrill, 1988).	The MOAS does not include any assessment of characteristics and circumstances variables for violence among persons with schizophrenia in the community.

5. Scale development

5.1 Instrument development procedure

Instrument development is complex and time consuming. It consists of the ten steps of guideline in scale development which identified by Crocker and Algina (1986). This study will use the ten steps as strategy for developing the TVRS. The ten steps of guideline in scale development consist of 1) identify the primary purpose for which the test scores will be used, 2) identify behavior that represent the construct or define the domain, 3) prepare a set of test specifications, delineating the proportion of items that should focus on each type of behavior identify in step 2, 4) construct an initial pool of items, 5) have items (reviewed and revise as necessary), 6) hold preliminary item tryouts (and revise as necessary), 7) field-test the items on a large sample representative of the examinee population for whom the test is intended, 8) determine statistical properties of item scores and, when appropriate, eliminate items that do not meet pre-established criteria, 9) design and conduct reliability and validity studies for the final form of the test, and 10) develop guidelines for administration, scoring and interpretation of the test scores (prepare norm tables, suggest recommended cutting scores or standards for performance) (Crocker and Algina, 1986).

5.2 Psychometric property testing

Regardless of a new development instrument tool, evidence of validity and reliability is of crucial importance. The psychometric property testing concerns with validity and reliability of instrument as follows:

5.2.1 Validity

Validity is a determination of the extent to which the instrument actually reflects the abstract construct being examined (Burn and Grove, 2005) or the degree to which an instrument measures what it is supposed to measure (Polit and Beck, 2004). Therefore when an instrument is valid, it truly reflects the concept it is supposed to measure (LoBiondo-Wood and Haber, 2006). There are four type of validity as follows:

5.2.1.1 Face validity is determined by inspecting the items to determine whether "on the face of it" the instrument contains important items that measure the phenomena under study (Dempsey and Dempsey, 2000) or concerns the extent to which items in a measure accurately reflect the full breadth of the construct of interest (Switzer et al., 1999).

5.2.1.2 Content validity is the extent to which the instrument represents the phenomena under study (Dempsey and Dempsey, 2000). Validity of content is usually establish by having experts in the field, and subjects or patients from the population for whom the instrument would be appropriate, review the instrument and provide critical evaluations of content (Switzer et al., 1999). Thus, the processes of content validity are preceded by concept analysis (domain identification) and a developmental stage in which there is generation of an instrument. Content validity is an interpretation of the results of the tool development, a critical review of the instrument's items in order to assess semantic clarity, domain sampling adequacy, and coherence of items. The evaluation methods include 1) literature review, includes historical and current uses of the concept/instrument, 2) personal reflection, and 3) analytical critique; (a) analytical critique of the instrument by experts (clinicians and

researchers), either individually or as a panel, in which both the individual items and the entire instrument are evaluated, and (b) analytical critique of the instrument by potential subjects (focus groups) (Higgins and Staub, 2006). A numerical value reflecting the level of content validity evidence can be obtained by using the content validity index (CVI) developed by Waltz and Bausell (1981 cited in Burn and Grove, 2005). With this instrument, experts rate the content relevance of each item using a 4-point rating scale (1=not relevant to 4=very relevant). The CVI for total instrument is the proportion of items rated as either 3 or 4. A CVI score of .80 or better indicates good content validity (Davis, 1999; Polit and Beck, 2004).

5.2.1.3 Construct validity is the most important and highest level of validity (Crookes, Davies, and Chiarelli, 2004; Polit and Beck, 2004). Construct validity is directly concerned with the theoretical relationship of a variable to other variables (DeVellis, 2003: 53). It emphasizes on the instrument really measuring, adequately measure the abstract concept of interest. Its expresses the confidence that a particular construct is valid. Construct validation method is a vital activity to the development of a strong evidence base which it is inextricably linked with the theoretical factors. Three aspects of the process of construct validity are 1) specifying the domain of relevant variables, 2) determining the extent to which observables measure the same or different things, and 3) doing relevant research to determine if the properties of measure consistent with the substantive theory (Nunnally and Bernstein, 1994). Establishing construct validity is a complicated and time consuming process because it requires that the measuring instrument be used in a succession of different studies (Dempsey and Dempsey, 2000). In instrument development should be use one or more of the ways described in their effort to assess

the instrument's worth. There are three ways to examine the construct validity as follows:

           1. Factor analysis, which is a method for identifying unitary clusters of related items or measures on a scale (Polit, Beck, and Hungler, 2001). Factor analysis provides helpful evidence about measures that are intended to have content validity (Nunnally and Bernstein, 1994). It refers to ability of an instrument to operationalize a theoretical construct by determining the relationships of a set of variables (Higgins and Staub, 2006). Thus, it may be used to determine 1) groupings or clusterings of variables, 2) which variables belong to which group and how strongly they belong, 3) how many dimensions are needed to explain the relations among variables, 4) a frame of reference to describe the relations among the variables more conveniently, and 5) score of individuals on such groupings (Nunnally and Bernstein, 1994: 447). The number of constructs in the instrument equivalence among comparison groups can be validated through the use of confirmatory factor analysis. Items designed to measure the same dimension should load on the same factor. Thus, items that do not fall into a factor may be deleted (Burn and Grove, 2005). Therefore when the theory is truly reflected, then the items related should be clustered when subjected to factor analysis.

           2. Contrasted or known group validity refers to ability of instrument identifies two groups of individuals who are suspected to score extremely high or low in the characteristics being measured by the instrument (LoBiondo-Wood and Haber, 2006). Samples are selected from at least two groups that are expected to have opposing responses to the items in the instrument. If the instrument is sensitive to individual differences in the trait being measured, meaning

that these two groups should differ significantly and evidence of construct validity would be supported. If the results obtained demonstrate statistically significant differences as expected, then the instrument is said to have a degree of construct validity.

3. Multitrait-multimethod validity refers to involves examining the relationship between instrument that should measure the same construct and between those that should measure different constructs (LoBiondo-Wood and Haber, 2006). The procedure involves measuring more than one construct by means of more than one method so that one obtains a fully crossed method-by-measure matrix (DeVellis, 2003). The results of one of those measures should then be correlated with the results of each of the others in a multitrait-multimethod matrix.

4. Criterion-related validity is concerned with the statistical testing of theoretical relationships within an instrument, between 2 instruments, and/or an instrument and an event that occurs before, during, or after an instrument is used to measure the concept of interest (Higgins and Staub, 2006). The instrument is said to be valid if its scores correlate highly with score on the criterion (Polit and Beck, 2004). There are two ways to examine the criterion-related validity as follows:

4.1 Predictive validity refers to the adequacy of an instrument in differentiating between people's performance on some future criterion (Polit and Beck, 2004; Polit et al., 2001). Therefore the criterion of instrument must be administered some time after the predictor instrument (Talbot, 1995). The preferred method for evaluating the predictive accuracy of violence risk assessment tools is the receiver operating characteristics (ROC), which plots 1-

specificity by sensitivity, and can be used to yield an area under the curve (AUC) (Altman and Bland, 1994).

The ROC curve is a means of evaluating prediction accuracy adapted from the field of signal-detection analyses. Ratios of true positives (hits) and false positives (false alarms) across different decision cutoffs of the predictive tools can be used to derive a measure of prediction accuracy, the area under the curve (AUC; Mossman, 1994). An AUC that equals .5 is chance; an AUC larger than .5 is better than chance, and an AUC of 1.0 is perfect prediction. In general, AUCs of .7 and above are considered adequate to good (McGraw and Wong, 1992; Rice and Harris, 1995).

Sensitivity and specificity can be illustrated is by constructing a curve of the ROC. Sensitivity refers to the ability of the tool to identify correctly cases of diseases. Alternatively, the sensitivity is the proportion of diseased cases that are identified as positive. Specificity refers to a test's ability to correctly identify cases without the disease. Specificity is calculated as the proportion of nondiseased cases that are identified as negative (Cotter and Peipert, 2005).

In ROC curve, sensitivity (the true positive rate) is plotted on the left vertical axis against the false positive rate on the bottom horizontal axis. The values of these axes go from 0% to 100%. The overall accuracy of a screening instrument can be described as the area under its ROC curve. The larger is the area under the curve, the more accurate is the screening instrument. The optimum cutoff score is generally at or near the shoulder of the ROC curve (Jekel et al., 1996 cited in Wang et al., 2009). The corner near the shoulder represents a

sensitivity of 100% and a false positive rate of 0%. The ROC curve helps decide the best cutoff point (Wang et al., 2009).

4.2 Concurrent validity refers to ability to detect a positive or negative statistical relationship between 2 instruments simultaneously measuring the same concept at the same time (Higgins and Staub, 2006) or how well an instrument correlates with another instrument that is known to be valid (Dempsey and Dempsey, 2000). Reported as a correlation coefficient (*r*) (Higgins and Staub, 2006).

5.2.2 Reliability

Reliability of instrument denotes the consistency of measures and indication of the extent of random error in the measurement method (Burn and Grove, 2005). If the same individuals are measured under the same conditions, a reliable measurement procedure will produce identical or nearly identical measurements (Gravetter and Forzano, 2003). A measure can be reliable but not valid (LoBiondo-Wood and Haber, 2006). Reliability is usually expressed as a number, called a coefficient (Dempsey and Dempsey, 2000). The most common estimate of reliability coefficient ranges from 0 to 1. The closer to 1 the coefficient is, the more reliable the tool. The reliable coefficient of instrument is 1.00 indicating perfect reliability and .00 indicating no reliability. A reliable coefficient of .80 is considered the lowest acceptable value for a well-developed psychosocial measurement instrument (Burn and Grove, 2005; Dempsey and Dempsey, 2000). Reliability testing composed of the internal consistency, stability and equivalence.

5.2.2.1 Internal consistency or homogeneity is another attribute of an instrument relates to reliability with which the items within the scale reflect or measure the same concept (LoBiondo-Wood and Haber, 2006). Internal consistency is the most widely used reliability approach. Its popularity reflects the fact that it is economical and is the best means of assessing an especially important source of measurement error in psychosocial instruments, the sampling of items (Polit and Beck, 2004).

5.2.2.2 Stability is concerned with the extent to which the instrument provides the same results are obtained on repeated administration of the instrument (LoBiondo-Wood and Haber, 2006; Polit and Beck, 2004) or the consistency of repeated measures of the same attribute with the use of the same scale or instrument (Burn and Grove, 2005; Higgins, and Staub, 2006). The data sets from the 2 test administrations are statistically compared from one test to the next. Assessing stability of measurement requires theoretical understanding of the concept of interest, the time between measurement, and intervening factors (Higgins and Staub, 2006). It is usually referred to as test-retest reliability. Test-retest reliability is the administration of the same instrument to the same subjects under similar conditions on two or more occasions. Reported as a correlation coefficient (r) (Higgins and Staub, 2006; LoBiondo-Wood and Haber, 2006).

5.2.2.3 Equivalence is focused on the comparison of two versions of the same paper and pencil instrument or of two observers measuring the same event (Burn and Grove, 2005). The resulting data can then be used to calculate an index of equivalence or agreement. That is, a reliability coefficient can be

computed to demonstrate the strength of the relation between the observes' rating (Polit et al., 2001).

Validity and reliability are two crucial aspects in the instrument development. If an instrument is unreliable, it lacks adequate validity or cannot possibly be valid (Crookes et al., 2004; Polit and Beck, 2004; Polit et al., 2001). An instrument cannot validly be measuring the attribute of interest if it is erratic or inaccurate and an instrument can be reliable, however, without being valid (Polit et al., 2001). Therefore developing new instrument should be established validity and reliability that represent the accuracy and quality of new instrument.

CHAPTER III

METHODOLOGY

The purpose of this study was to develop the Thai Violence Risk Scale (TVRS) for persons with schizophrenia in the community. This part of the paper presents the methodology used for constructing the scale and testing its validity and reliability. The following provides details of the research design, population and sample, research instrument, scale development, data collection, protection of human subjects, and data analysis procedures.

Research design

This is a scale development study. The development procedures comprised ten steps guided by Crocker and Algina (1986), including: step 1, identify the primary purpose for which the test scores will be used; step 2, identify behaviors that represent the construct or define the domain; step 3, prepare a set of test specifications, delineating the proportion of items that should focus on each type of behavior identified in step 2; step 4, construct an initial pool of items; step 5, have items reviewed (and revise as necessary); step 6, hold preliminary item tryouts (and revise as necessary); step 7, field-test the items on a large sample representative of the examinee population for whom the test is intended; step 8, determine the statistical properties of item scores and, when appropriate, eliminate items that do not meet pre-established criteria; step 9, design and construct reliability and validity studies for the final form of

the test; and step 10, develop guidelines for administration, scoring, and interpretation of the test score.

Population and Sample

In this study, the target population was Thai persons with schizophrenia in the community, whereas the samples were persons with schizophrenia in the community in four regions of Thailand.

The following criteria were used to select the samples in this study:

1) being diagnosed with schizophrenia by ICD-10,

2) being 18 years of age or older,

3) living in the community,

4) being able to use Thai verbal communication, and

5) willing to participate in this study.

Criteria for exclusion from the study include:

1) being diagnosed with schizophrenia with other disorders such as mental retardation (IQ less than 70), organic brain syndrome, and neurological problems,

2) having hostility, agitation, shouting, or throwing objects,

3) committing violently to themselves or others, or

4) carrying a weapon.

As noted in the research design, this study consisted of ten steps. So, the sample size estimation and sampling methods were separately conducted as follows:

1. Samples of the preliminary item tryouts by item review

In the case of conducting the preliminary item tryouts, the samples for item review were ten persons with schizophrenia that met the criteria as described above at the outpatient department of the Galya Rajanagarindra Institute, Mental Health Department, Ministry of Public Health, Thailand. They were selected by convenient sampling method (n=10).

2. Samples of the determining statistical properties of item scores by item analysis and EFA

The samples of the item analysis and EFA were persons with schizophrenia in the community that had committed violence and met the criteria as described above at the outpatient department of the Galya Rajanagarindra Institute, Mental Health Department, Ministry of Public Health, Thailand. Nunnally (1967 cited in Crocker and Algina, 1986) has suggested that the minimum number of samples to use in an item analysis is to have 5 to 10 times as many samples as items, whereas Tinsley and Tinsley (1987 cited in DeVellis, 2003) have suggested a ratio of about 5 to 10 subjects per item up to about 300 subjects for factor analysis. Thus, a sample size of 270 in an item analysis and EFA for the 27-item TVRS was required. For the current study, however, the actual sample comprised 300 persons with schizophrenia in the community. Recruiting the samples via convenient sampling was employed to select the samples (n=300).

3. Samples of the designing and construct reliability and validity studies for the final form of the test

3.1 Samples for testing confirmatory factor analysis

This study used confirmatory factor analysis to test construct validity. Thus, the samples for testing the confirmatory factor analysis were persons with schizophrenia in the community that met the criteria as described above at the outpatient department of psychiatric hospitals, Mental Health Department, Ministry of Public Health, in four regions of Thailand. A sample size of more than 200 may be needed to reflect validity levels (Crocker and Algina, 1986). However, as regards the sample size for testing confirmatory factor analysis, Comrey (1973 cited in DeVellis, 2003) classifies a sample of 500 as very good and 1,000 as excellent.

In order to meet the base criterion of at least 500 persons with schizophrenia in the community, four psychiatric hospitals which had a number of outpatients in the outpatient department of more than 200 per day were purposively selected from four regions of Thailand, including Suan Prung Psychiatric Hospital in the north region, Prasrimahabhodi Psychiatric Hospital in the northeast region, Galya Rajanagarindra Institute in the central region, and Suansaranrom Hospital in the southern region. In each of the four psychiatric hospitals, thus, 125 persons with schizophrenia in the community were conveniently sampled. Moreover, 20% of the total sample size was added to take into account dropouts (adding 5% to each of the four psychiatric hospitals). The current study, therefore, has a total sample of 600 persons with schizophrenia in the community. However, the actual total samples in this study were 604 persons with schizophrenia in the community.
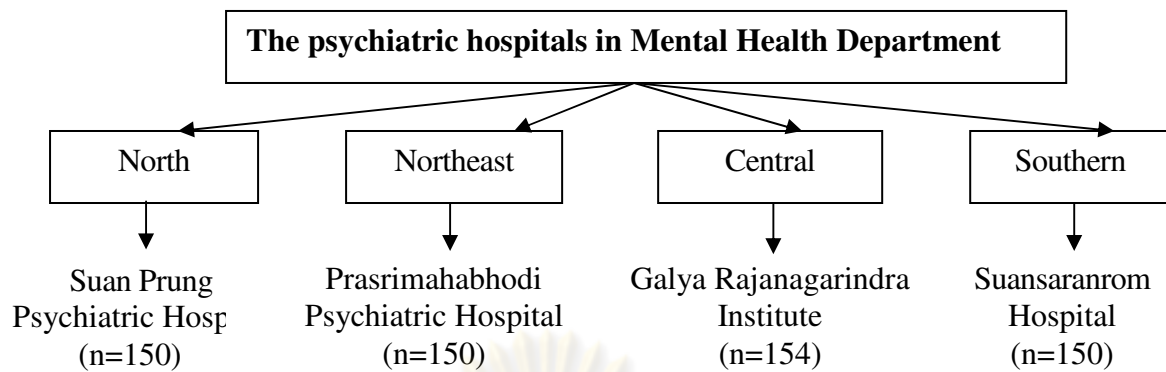
Figure 2: A process of the sampling

3.2 Samples for testing criterion-related validity

The sample for testing criterion-related validity by predictive validity consisted of 154 persons with schizophrenia in the communities, which were conveniently sampled. They were the same as the samples for testing the confirmatory factor analysis, as described above, from the central region (Galya Rajanagarindra Institute). They were asked for violence and violent recidivism outcome at 2 months follow-up by telephone after the first face-to-face interview. However, the actual total samples in this study were 128 persons with schizophrenia in the community. Twenty-six other persons with schizophrenia in the community did not connect.

3.3 Samples for testing reliability

The sample for testing the reliability was the same from the samples for testing the confirmatory factor analysis, as described above (n=604).

Instrumentation

The sociodemographic data sheet was developed by the researcher. This instrument was used to collect demographic and socioeconomic data, including age, gender, religion, marital status, educational level, occupational, income, age at first instance of psychiatric illness, length of psychiatric illness, previous psychiatric inpatient hospitalizations, number of previous psychiatric inpatient hospitalizations, age when first admitted in relation to psychiatric illness, having a history of violence, number of incidences of violence, medication noncompliance, length of medication noncompliance, substance use history, and substance abuse.

Procedures of developing the TVRS

The following sections address the development of the Thai Violence Risk Scale (TVRS). There were ten steps in the scale development procedures. Each of these steps was examined in detail.

1. Identifying the primary purpose for which the test scores will be used

The TVRS was developed for assessing violence risk among Thai persons with schizophrenia in the community. The intended use of the TVRS was to assess violence risk for clinical and research purposes in both the outpatient department and in the community setting. The user is the nurses who experienced in taking care of persons with schizophrenia at least three years.

2. Identifying behaviors that represent the construct or define the domain

In this study, violence risk refers to the probability estimates of Thai persons with schizophrenia in the community intentionally using physical force, threats or actual, against another person, himself or herself, or a group of people that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation. The estimates are determined by the characteristics of persons with schizophrenia and their circumstances that are associated with violence.

Consequently, existing knowledge about the characteristics and circumstances of violence among persons with schizophrenia in the community that were relevant to violence risk was ascertained by researching both Western and Thai databases published between 1990 and 2010. A broad search strategy for potential articles was used in order to include all relevant studies. Electronic searches using Medline, CINAHL, EBSCO, ProQuest, SCIENCE DIRECT, Sage, Google, and Thailis were conducted, with the following key words: violence, violent behavior, violence risk, violence risk assessment, aggression, aggressive behavior, and schizophrenia.

From the literature review, there are various characteristics and circumstances for violence among persons with schizophrenia in the community. However, the characteristics and circumstances included in the TVRS were reduced from the original 78 to 29 because these characteristics and circumstances provide a concrete way to assess violence risk. Moreover, these characteristics and circumstances are commonly available in persons with schizophrenia or are easily to

assess routinely among persons with schizophrenia in the community. Other characteristics and circumstances were excluded because those are not commonly available in persons with schizophrenia or are difficult to assess routinely such as psychopathy, biological, prenatal, and developmental factors.

In this study, thus, violence risk of persons with schizophrenia comprised two components: characteristic and circumstances. Characteristic component included younger age, male gender, antisocial personality disorder, educational failure, living alone, younger age at first hospitalization with schizophrenia, history of substance use, limited or no vocational activity, history of violence, and history of abuse, homeless, weapon availability, aggressive behavior, delusions, hallucinations, excitement, suspiciousness, hostility, lack of insight, symptoms of mania, depressive symptoms, threat/control override symptom, uncoorperativeness, disorientation, medication noncompliance, and substance abuse and circumstances component include poor peer relationships, poor family relationships, and expressed emotions in family.

3. Preparing a set of test specifications, delineating the proportion of items

As described above, violence risk among persons with schizophrenia is comprised of the components of characteristic and circumstances. Thus, before conducting an initial pool of items, operational definition of the violence risk among persons with schizophrenia from the literature review were identified by the researcher in order to make sure that the definitions represented all aspects of the

concept. The content of the characteristics for violence among person with schizophrenia in the community that composed of 26 items are as follow:

1. Younger age refers to Thai persons with schizophrenia in the community who are 40 years or under.

2. Male gender refers to male Thai persons with schizophrenia in the community as shown on an ID card.

3. Antisocial personality disorder refers to Thai persons with schizophrenia in the community that have some criteria as having an antisocial personality disorder based on ICD-10.

4. Educational failure refers to Thai persons with schizophrenia in the community that have failed to continue their elementary or secondary education because of poor grades and/or other behavioral problems.

5. Living alone refers to Thai persons with schizophrenia in the community that are living without a partner or other persons in their house regardless of marital status.

6. Younger age at first hospitalization with schizophrenia refers to Thai persons with schizophrenia in the community that have been admitted to the hospital for the first time for schizophrenia and that are 30 years or younger.

7. History of substance use refers to Thai persons with schizophrenia in the community that have excessively used alcohol and/or drugs (amphetamine, cannabis, benzodiazepines, inhalants, opiates, and stimulants, etc.), causing social or health problems.

8. Limited or no vocational activity refers to Thai persons with schizophrenia in the community that are unemployed or have been laid off because of no outcome or no capability related to any occupation.

9. History of violence refers to Thai persons with schizophrenia in the community that have exhibited past evidence of committing intentional use of physical force, threatened or actions, against another person, one's self, or a group of people with or without a weapon.

10. History of abuse refers to Thai persons with schizophrenia in the community that have exhibited past evidence of being insulted by other persons, including sexual abuse.

11. Aggressive behavior refers to behavior intended to produce deliberate harm to one's self or another by various emotional communicative strategies and bad or negative behaviors of Thai persons with schizophrenia in the community, including verbal aggression, physical aggression against self, physical aggression against objects, and physical aggression against others.

12. Delusions refer to psychotic symptoms in relation to a false belief in something untrue of Thai persons with schizophrenia in the community, including delusions of jealousy, persecution, grandiose, being controlled, and reference.

13. Hallucinations refer to psychotic symptoms in relation to a sensory perception of something that is not there among Thai persons with schizophrenia in the community, including command hallucinations, auditory hallucinations, and visual hallucinations.

14. Excitement refers to psychotic symptoms in relation to expressing feelings without restraint, manifesting speech that is hurried, exhibiting an elevated

mood, showing an attitude of superiority, dramatizing oneself or one's symptoms, manifesting loud and boisterous speech, exhibiting over activity or restlessness, and exhibiting excess of speech with reference to Thai persons with schizophrenia in the community.

15. Suspiciousness refers to psychotic symptoms in relation to unrealistic or exaggerated ideas of persecution, as reflected in guardedness, a distrustful attitude, or suspicious hypervigilance of Thai persons with schizophrenia in the community.

16. Hostility refers to psychotic symptoms in relation to an emotional state characterized by enmity toward others and a desire to harm those at whom the antagonism is directed, again with reference to Thai persons with schizophrenia in the community.

17. Lack of insight refers to psychotic symptoms in relation to deficiency or absence of awareness and understanding of Thai persons with schizophrenia in the community about their illness.

18. Symptoms of mania refer to psychotic symptoms in relation to an abnormally-elated mental state, typically characterized by feelings of euphoria, lack of inhibitions, racing thoughts, diminished need for sleep, talkativeness, risk taking, and irritability with respect to Thai persons with schizophrenia in the community.

19. Depressive symptoms refer to psychotic symptoms in relation to sadness, inactivity, difficulty with thinking and concentration, a significant increase or decrease in appetite and time spent sleeping, feelings of dejection and hopelessness, and sometimes suicidal thoughts or an attempt to commit suicide of Thai persons with schizophrenia in the community.

20. Threat/control override symptoms refer to psychotic symptoms in relation to the experience of Thai persons with schizophrenia in the community whereby people want to harm themselves and/or they cannot control their own thinking due to either a mind that is perceived to be dominated by forces outside their own control or the perception that other people's thoughts were put into their heads.

21. Uncoorperativeness refers to psychotic symptoms in relation to the unwillingness of Thai persons with schizophrenia in the community to cooperate with other persons.

22. Disorientation refers to psychotic symptoms in relation to a state of mental confusion characterized by inadequate or incorrect perceptions of place, time, person, or identity on the part of Thai persons with schizophrenia in the community.

23. Medication noncompliance refers to Thai persons with schizophrenia in the community discontinuing their medication without the recommendation of the treating physician.

24. Substance abuse refers to current excessive use by Thai persons with schizophrenia in the community of alcohol and/or drugs that causes health or other kinds of problems.

25. Homeless refers to Thai persons with schizophrenia in the community that have lived without accommodation and have lived in public spaces, footpaths, under the expressway, etc. for more than three months.

26. Weapon availability refers to Thai persons with schizophrenia in the community who often use weapons such as a knife or gun to cause physical or psychological harm to others or routinely carry (although they may not use them) weapons as part of everyday life.

Moreover, the content of the circumstances for violence among person with schizophrenia in the community that composed of 3 items are as follow:

1. Poor peer relationships refer to perceived hostility among peers, experiences/feelings of being bullied or threatened by peers on the part of Thai persons with schizophrenia in the community.

2. Poor family relationships refer to Thai persons with schizophrenia in the community that have no family caregivers, lack support from family members or spouse (feel let down or dissatisfied with family or have high levels of arguments with family), have conflict in the family, receive poor parenting, reside in restrictive housing, or do not feel "listened to" by family members.

3. Expressed emotions in family refer to perceived hostility, critical, and emotional over-involvement of family members of Thai persons with schizophrenia in the community.

Then, the item pool was generated based on the contents of both components that covered all aspects of the violence risk.

4. Constructing an initial pool of items

4.1 Item format

The item format of the TVRS was designed as an alternate choice, yes-no question for the face-to-face interview instrument. Each item was given a different weighting score (yes=1, 2, or 3 and no=0) to reflect the extent of the problems identified by the characteristics or circumstances for violence. A yes answer indicated the characteristic or circumstances in the question as low (1), moderate (2), or high (3), respectively, in association with violence risk. A no answer (0) indicated

that the characteristic or circumstances in the question had no association with violence risk.

4.2 Generating the item pool of the first draft of the TVRS

An item pool for the first draft of the TVRS was generated based on operational definitions of violence risk from reviewing the literature. This included literature examining the relationships and predictions between violence risk and the independent variables representing characteristics and circumstances of persons with schizophrenia. Information from the reviewed literature was then used for constructing item statements of the item pool. Each item was constructed by writing a short declarative statement reflecting the characteristics and circumstances for violence among Thai persons with schizophrenia in the community. In order to cover all aspects of the operational definitions of violence risk, items were constructed as the large item pool that was expected to be representative of the universe items of the TVRS.

Therefore, the item pool consisted of 29 items reflecting all aspects of all constructs of violence risk among Thai persons with schizophrenia in the community. The characteristic component comprised 26 items and the circumstances component comprised 3 items (Appendix D).

After completing the item pool process, all items of the first draft of the TVRS were used to conducting items reviewed.

5. Conducting items reviewed

5.1 Content validity

In this study, item reviewed was conducted by content validity. Regarding the number of experts, nine mental health experts were invited to validate

the content of all of the item pools of the first draft of the TVRS. Two of the nine experts were nurse instructors with expertise in mental health nursing and schizophrenia and violence research. Three other experts were mental health nurses that had closely worked with Thai persons that exhibited schizophrenia violence in the community setting. Three other experts were psychiatrists with expertise in mental health and violence research, and the last one was a psychologist with expertise in mental health and instrument development research.

Thus, the Content Validity Form, which contained 2 important issues: clarity of expression and relevance in relation to violence risk in Thai persons with schizophrenia in the community. Regarding clarity of expression, the adequacy of each item in terms of the language used, offensiveness or appearance of bias, and redundancy was examined. The nine experts were asked toward the Content Validity Form with the respect to placing each item in one of four-point scale that reflected: 1) relevance to the operational definition by using the four-point rating scale: 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, 4 = highly relevant and using open suggestions, and 2) clarity of items by using open suggestions. Therefore, the rated scores on the Content Validity Form, and the comments and suggestions on each item by experts, were used to consider whether the item should be refined, changed, corrected or deleted (Crocker and Algina, 1986; Devellis, 2003; Polit and Beck, 2006; 2008).

In this study, the content validity of the first draft of the TVRS was determined with the Items Content Validity Index (I-CVI) and the Scale Content Validity Index/Average Proportion (S-CVI/Ave).

The I-CVI was computed as the number of raters giving a rating of either 3 or 4 on the 4-point relevance scale, divided by the number of experts; that is, the number in agreement about relevancy (Polit and Beck, 2006, 2008).

$$\text{I-CVI} = \frac{\text{Number of experts on which items agreed}}{\text{Total number of experts}}$$

The S-CVI/Ave was computed by averaging the I-CVIs, it as judged content valid (Polit and Beck, 2006, 2008).

$$\text{S-CVI/Ave} = \frac{\text{Total of I-CVIs}}{\text{Total number of items}}$$

When there are nine experts and because of the risk of chances of agreement when ratings are dichotomous (relevant versus not relevant), items with a I-CVI score of .78 or higher should be retained (Lynn, 1986; Polit and Beck, 2008; McIntire and Miller, 2007), and a S-CVI/Ave score of .80 or better indicates good content validity (Davis, 1992; Polit and Beck, 2004; Waltz, Strickland, and Lenz, 1991).

So, item deletion was performed when the I-CVI less than .78 that it would be deleted (Polit and Beck, 2006; 2008). Comments and suggestions on each remaining item by the nine experts were clustered. Item statements that were ambiguous were considered for revising. Further, whenever there were redundant items, only the best one was selected. However, DeVellis (2003) suggested that the developer should make careful, informed decisions about how to use their advice.

Then, the 29 items of the pool were revised or deleted following the comments and suggestions of the experts. Two items of the characteristic

component were deleted because of their irrelevancy to the meaning of the operational definitions.

After completing the content validity process, the number of 29 items in the item pool of the first draft of the TVRS was reduced to 27 items in this step and they were used to construct the second draft of the TVRS (Appendix E). The characteristic components comprised 24 items and the circumstances component comprised 3 items. The other 2 items of characteristic component were deleted because the I-CVI of both items was less than .78. As a result, the second draft of the TVRS comprising 27 items still reflected all aspects of the risk of violence of Thai persons with schizophrenia in the community provided in the operational definitions.

5.2 Weighting score

In this study, each item was weighted on a three-point scale (1-3) by the nine mental health experts. A 1 rating indicated the characteristic or circumstances for violence of persons with schizophrenia in the question with low association with risk of violence. A 2 rating indicated the characteristic or circumstances for violence of persons with schizophrenia in the question in moderate association with violence risk, and a 3 rating indicated the characteristics or circumstances in the question had the highest association with violence risk. Therefore, the weighted score on each item was the median of the score from the nine experts.

In this process, after evaluating the content validity, nine other mental health experts (not content experts) were invited to weight score. They were asked to rate each item of the scale. Four of nine experts were mental health nurses that had closely worked with Thai persons that exhibited schizophrenic violence. Four

other experts were psychiatrists with expertise in mental health and that had closely worked with Thai persons that exhibited schizophrenic violence. The last one was a psychologist that had closely worked with Thai persons that had exhibited schizophrenic violence.

Item weights were assigned by the mental health expert that performed during the scale development stages to help establish the construct validity of the scale. The nine mental health experts were asked toward the Weighted Score Form with respect to placing each item on one of three-point scale that reflected the characteristics and circumstances in question has relationship with violence risk by using the three-point rating scale: A 1 rating indicated the characteristic or circumstances for violence of persons with schizophrenia in question in low association with violence risk. A 2rating indicated the characteristic or circumstances for violence of persons with schizophrenia in question in moderate association with violence risk, and a 3 rating indicated the characteristic or circumstances for violence of persons with schizophrenia in question that had the highest association with violence risk. The median item ratings from the nine mental health experts were then used to assign item weights (Stoove, Fry, and Lintzeris, 2008) according to relative violence risk.

After the nine mental health experts weighted the score on 27 items, there were 3 items = 1 score, 6 items = 2 scores, and 18 items = 3 scores (Appendix F).

6. Conducting preliminary item tryouts

In this study, the preliminary item tryouts were conducted by using item review. Before started the next step, the second draft of the TVRS was tried out for the appropriateness and clarity of each item wording through face-to-face interview with 10 schizophrenic patients in order to improve the items that were difficult to understand or answer. After the item review, they made no comments and offered no suggestions. So, all items were appropriateness and clarity of each item wording. (Appendix H).

7. Conducting field-test the items on a large sample representative of the examinee population for whom the test is intended

In this study, the samples of the field test of the items on a large sample representative of the examinee population for whom the test was intended comprised 300 Thai persons with schizophrenia that had committed violence, as described above. This step was conducted in order to construct the final draft of the TVRS. Then, in order to meet the purposes of this study, the second draft of the TVRS was examined by using item analysis and exploratory factor analysis in step 8.

8. Determining statistical properties of item scores

8.1 Item analysis

In this study, item analysis was employed to select the appropriate items that were representative of the sample domain of the item universe in order to construct the final draft scale. Therefore, the descriptive statistics of each

item, item-total correlation, item-item correlation, and Cronbach's alpha coefficient were examined.

The descriptive statistics of each item were examined by using mean, standard deviation, skewness, and kurtosis. Kurtosis measures whether the distribution is peaked or flat relative to a normal distribution. Skewness measures the symmetry of the distribution. Together, these statistics allow one to determine the degree to which a population departs from a normal distribution. The items which represented normal distribution were selected. Therefore, the criteria for selecting the appropriate items were skewness values falling inside the range of -1 to +1 (Hair et al., 1998), and the magnitude of the kurtosis was less than 2 (Wegner, Schnoll, and Gipson, 1998).

Item-total correlation was proposed in terms of the precision of the item indicating how strongly an individual item reflected the total scale. Psychometrically strong items would have moderate to high correlations with the scale total and individual items. This study calculated the item-total correlation by using the Pearson product-moment correlation. Regarding a common rule of thumb, the item-total correlation should be between .30 and .70. Those less than .30 did not contribute much to the measurement of the concept, while those greater than .70 were probably redundant (Polit and Hungler, 1999). Therefore, items with an item total correlation of less than .30 were deleted, and the paired items with an item-item correlation greater than .70 were considered the best for each paired item.

The Cronbach's alpha coefficient, which represented the internal consistency of the scale, was used as the criterion for keeping appropriate items. It can be applied when test items are scored dichotomously, but the alpha has

an advantage over KR-20 of being applicable when items are weighted. Hence, the Cronbach's alpha coefficient is more flexible than the KR-20 (Brown, 2002). When the alpha if any items deleted was less than .70, those items would be retained. In addition, the alpha of the first draft scale should be at least .70 for new developed instruments (Nunnally and Bernstein, 1994).

After completing the item analysis, the number of 27 items in the second draft scale was reduced to 17 items in this step and they were used for conducting the construct reliability and validity studies.

8.2 Exploratory factor analysis (EFA)

Exploratory factor analysis (EFA) was employed to determine the latent variables (factors) comprising the TVRS for constructing the final draft scale. Therefore, a principal components extraction with varimax (orthogonal) rotation was initially used to extract two factors based on the literature review. Item loadings with an absolute value of 0.4 or higher were used to describe the factors (Polit and Beck, 2008).

After completing EFA, the second draft scale was comprised of 17 items based on 2 factors in this step: characteristic and circumstances factors. Then, these were used for constructing the final draft of the TVRS (Appendix I). Consequently, the final draft of the TVRS was composed of 17 items that still covered all the aspects of violence risk of Thai persons with schizophrenia in the community provided in the operational definitions.

9. Designing and construct reliability and validity studies for the final form of the test

The expected outcome of this step was a valid and reliable research instrument for measuring violence risk with the TVRS among Thai persons with schizophrenia in the community. This step consisted of confirmatory factor analysis, predictive validity, and internal consistency reliability, as follows:

9.1 Confirmatory factor analysis

Confirmatory factor analysis was used to test the construct validity of the TVRS on a large group of samples in the field study.

9.2 Predictive validity

Predictive validity analysis was used to test the criterion-related validity of the scale. This step was composed of sensitivity, specificity, positive predictive value, negative predictive value, and Areas Under the Curve (AUC values) was used to test the ability of the scale.

9.3 Internal consistency reliability

Internal consistency reliability was used to test the reliability of the TVRS on a large group of samples in the field study by using Cronbach's alpha method.

10. Developing scoring and interpretation of the test score

Next, the level of violence risk was created on the basis of the TVRS total scores. The TVRS score should indicate the level of violence risk; the higher the score, the higher the violence risk. The TVRS cut-off score was validated based on sensitivity (number of patients with violence correctly identified by the TVRS),

specificity (number of patients without violence correctly excluded by the TVRS), and the Area Under the Curve (AUC) in a Receiver Operating Characteristics (ROC) analysis plotting the sensitivity (y-axis) against 1-specificity (x-axis). The optimal cut-off score is the one closet to or above 90% sensitivity, 90% specificity, and 90% under the curve in the upper left corner. However, sensitivity and specificity are with values of 80% being good and 70% being fair (Dennis, Chan, and Funk, 2006).

The procedures for developing the TVRS can be summarized as shown in figure 3.

Procedures for developing the TVRS

↓

1. Identifying the primary purpose for which the test scores will be used

↓

2. Identifying behaviors that represent the construct or define the domain

↓

3. Preparing a set of test specifications, delineating the proportion of items

↓

4. Constructing an initial pool of items

↓

The first draft of the TVRS   *(29 items)*

↓

5. Conducting items reviewed by 9 content experts

↓

The second draft of the TVRS   *(27 items)*

↓

6. Conducting preliminary item tryouts by item review   *(n=10)*

↓

7. Conducting field test the items on a large sample

↓

8. Determining statistical properties of item scores by item analysis and EFA *(n=300)*

↓

The TVRS   *(17 items)*

↓

9. Design and construct reliability and validity studies for the final form of the test

Construct validity	Criterion-related validity	Internal consistency
by CFA	by predictive validity	reliability by
(n=604)	*(n=128)*	Cronbach's alpha
		Coefficient
		(n=604)

↓

10. Develop scoring and interpretation of the test score

Figure 3: The TVRS development procedures

Research assistants' training

In this study, the researcher utilized eight research assistants. The head nurse of each psychiatric hospital was the facilitator for recruiting two research assistants, who had graduated in the area of mental health and psychiatric nursing.

Before the data collection, the researcher made an appointment with the research assistants. The description of the study and data collection procedure was discussed. Any lack of clarity or misunderstandings about the data collection procedures was also discussed.

Initially the research assistants observed the researcher collecting the data from participants. After the observation, the procedure was discussed in detail and the research assistants were encouraged to ask questions about the procedure.

After that, the researcher observed the research assistants collecting data from the first participant. After the observation, the procedure was discussed in detail. Problems occurring during the data collection were discussed.

Data collection

In this study, the data collections were divided into three steps. Step one was the data collection for determining the statistical properties of item scores by item analysis and EFA in order to construct the final draft of the TVRS. Step two was the data collection for the construct reliability and validity studies in order to test the construct validity, criterion-related validity, and internal consistency reliability of the TVRS.

1. Data collection for determining statistical properties of item scores by item analysis and EFA

The purpose for determining the statistical properties of items in the second draft of the TVRS was to perform item try-out analyzed by using item analysis and EFA. The data in this step were collected by the researcher and research assistants. The participants were persons with schizophrenia in the community who were representatives of the samples.

The data collection for determining the statistical properties of item scores by item analysis and EFA was begun after receiving the permit letter from the Ethical Review Committee of the Galya Rajanagarindra Institute. According to the research settings of the determining statistical properties of item scores by item analysis and EFA, the Galya Rajanagarindra Institute was selected. The researcher had to send the official letter, authorized by dean of the Faculty of Nursing, Chulalongkorn University, to the director of the Galya Rajanagarindra Institute in order to allow the researcher to collect data at the supervision area. After obtaining permission to collect the data from this institute, the researcher and research assistants began collecting the data after receiving permission from legal authorities.

Sample codes of the samples were recorded by the researcher and research assistants. After mutual agreement between the participants and researcher or research assistants, the participants signed their names on the consent sheets, and the researcher or research assistants explained the objectives and usefulness of the study before collecting the data.

Each participant then completed the informed consent sheet, the sociodemographic data sheet, and the second draft of the TVRS. The face-to-face

interview of the participants by researcher and research assistants was used for collecting the data. While answering the scales, the participants could refuse to answer the scale whenever they wanted. After each participant had completed the scale, the researcher and research assistants checked its completeness and kept it in a locked cabinet, and only the researcher could access the data. The process of data collection testing item analysis and EFA in this study started on 15 November 2010 and continued until 23 December 2010.

2. Data collection for construct reliability and validity studies for the final form of the test

The data collection for the construct reliability and validity studies was generally similar to that in the data collection for determining the statistical properties of item scores by item analysis and EFA, but the settings and scale were quite different.

2.1 Data collection for testing construct validity and internal consistency reliability

The data collection for construct reliability and validity studies began after receiving the permit letter from the Ethical Review Committee of each psychiatric hospital, Mental Health Department. The research settings for the data collection for construct reliability and validity studies were the outpatient departments of the psychiatric hospitals, Mental Health Department, in four regions of Thailand. These included the north (Suan Prung Psychiatric Hospital), the northeast (Prasrimahabhodi Psychiatric Hospital), the central region (Galya Rajanagarindra Institute), and the southern region (Suansaranrom Hospital). Therefore, the official letters were authorized by the Dean of the Faculty of Nursing, Chulalongkorn

University, and were sent to the director of each psychiatric hospital to allow the researcher to collect data in their supervision areas. After obtaining permission to collect the data from each psychiatric hospital, the researcher and research assistants started to collect the data after having the permission from legal authorities.

The sample codes of the samples were recorded by the researcher and research assistants. After mutual agreement between the participants and researcher or research assistants, the participants signed their names on the consent sheets, and the researcher or research assistants explained the objectives and usefulness of the study before collecting the data.

Each participant then completed the informed consent sheet, the demographic data sheet, and the final draft of the TVRS. The face-to-face interview of the participants by the researcher and research assistants was used to collect the data. While answering the scale, the participants could refuse to answer the scale whenever they wanted. After each participant completed the scale, the researcher and research assistants checked its completeness and kept it in a locked cabinet, and only the researcher could access the data. The process of the data collection testing the construct validity and internal consistency reliability in this study began on 10-31 January 2011.

2.2 Data collection for testing criterion-related validity

As described in the sample for testing criterion-related validity, The sample for testing the criterion-related validity by predictive validity of the samples was the same from the samples for testing the confirmatory factor analysis from the central region (Galya Rajanagarindra Institute). After the face-to-face interview, the participants were asked to allow the researcher to collect data about

violence and violent recidivism at 2 months follow-up by telephone. After obtaining permission to collect the data from the participants, the researcher and research assistants began to collect the data after receiving permission.

Then, they were asked about violence and violent recidivism at 2 months follow up by telephone. However, the actual persons that were asked about this issue in this study were both persons with schizophrenia in the community and their family members. The process of data collection for testing criterion-related validity at 2 months follow-up by telephone in this study started in 10-31 March 2011.

Protection of human subjects

This procedure was performed before collecting the data in order to explain that there was no risk to the samples in this study. Approval of the study plan for the protection of human subjects was obtained from the Ethical Review Committee for Research Involving Human Subjects and/or Use of Animals in Research, psychiatric hospital, Department of Mental Health, Ministry of Public Health, before collecting the data in this study.

Before collecting the data, the samples were given an information sheet which described the title of the study, its purpose, assurance of the samples' anonymity, the usefulness of the results of the study, a chance to ask questions and express concerns, time and tasks to be completed, and the name and address of the researcher, after which the researcher also responded to any questions the potential participant may have had. There was no harm to the samples in this study. Neither was there any cost to or payment requested from the samples in the study.

During the collecting data, the process would be stopped whenever the samples needed without penalty. Moreover, the process would be stopped whenever the samples exhibited severe psychotic symptoms or presented a danger to themselves or others. Then, the researcher or research assistant would refer them for treatment and nursing care by the psychiatrist or mental health nurse in the hospital.

In some cases, if the samples were psychological harm, the researcher or research assistant would offer to sit beside the sample and give the sample supportive therapy until the sample got well. After that, for continuous care, the researcher or research assistant mention the symptoms to the individual's psychiatrist or mental health nurse. However, if the sample still felt psychological harm, the researcher or research assistant would suggest that they receive treatment or nursing care by the psychiatrist and mental health nurse just as with persons with severe psychotic symptoms or dangerous patients.

After completing the data collection, all data were kept anonymous through the use of name codes. The scale and name codes were stored in a locked cabinet. This explained before they signed their names on the informed consent sheet.

Data analysis

Data were analyzed by using the Statistical Package for the Social Science for Personal Computer (SPSS/PC) version 15, and LISREL 8.52 was used for testing validity using confirmatory factor analysis. Before conducting the data analysis, all data were screened through descriptive analysis in order to detect missing data.

1. Sociodemographic data of samples

The sociodemographic features of the sample were assessed by descriptive statistics consisting of frequency and percentage, mean, standard deviation, and range.

2. Item description

Item description was assessed by descriptive statistics, including mean, standard deviation, skewness; and kurtosis provided information on outliers and normal distribution. If the skewness or kurtosis of any items was zero, their distributions were normal (Wegner et al., 1998). Items whose skewness values fall inside the range from -1 to +1 represent fair normal distribution (Hair et al., 1998).

3. Item analysis

The item analysis in this study selected the best item for constructing the final draft of the TVRS before testing its construct validity. The analyses involved descriptive statistic, Cronbach's alpha coefficient, corrected item-total correlation, and item-item correlation. The results of the various analyses were used as the criteria for eliminating poorly-performing items.

Psychometrically strong items would have moderate to high correlations with the scale total and individual items (Cohen, 1992). In this study, the items that had a correlation coefficient below .30 or above .70 were eliminated, and the alpha of the total scale was accepted at least .70 for an early developed instrument (Nunnally and Bernstein, 1994).

4. Construct validity

4.1 Exploratory factor analysis (EFA)

Exploratory factor analysis (EFA) was used to obtain the factor structure to be included in the overall solution. In this study, the EFA was performed using SPSS version 15.0 for Windows to extract the factors from the second draft of the TVRS scores. The results of the EFA were used for constructing the final draft of the TVRS before testing its construct validity. Item loading with an absolute value of 0.4 or higher was used to describe the factors (Polit and Beck, 2008).

4.2 Confirmatory factor analysis (CFA)

The construct validity of the TVRS was examined through confirmatory factor analysis (CFA). The CFA tested the construct validity of the measurement model of the TVRS by using a second order factor analysis. The specific model fit indices used for measuring the overall model fit in this study was Chi-square (χ^2) statistics. It was suggested that the value of the chi-square be divided by degree of freedom (χ^2/df) less than 2.00 (Pedhazur and Schmelkin, 1991), the *p*-value be larger than .05, the goodness of fit index (GFI) be 0.9 or larger (Byrne, 2001; Munro, 2001), and the Root mean square error of approximation (RMSEA) be 0.08 or less (Browne and Cudeck, 1993; Byrne, 2001). The adjusted goodness of fit index (AGIF) was 0.9 or larger (Hair et al., 1998), and the Comparative fit index (CFI) was 0.9 or larger (Hair et al., 1998; Kline, 1998; Sittipong Wattananonsakul, Panrapee Suttiwan and Sompoch Iamsupasit, 2010)

5. Criterion-Related validity

Predictive validity

Predictive validity was used to examine the criterion-related validity. The predictive validity was used to predict whether the future performance of the basis of instrument score would to the validity of the instrument. Predictive validity was assessed by Receiver Operator Characteristic (ROC) analysis yielding Areas Under the Curve (AUC values).

The AUC of the ROC graph can be taken as an index for interpreting the overall accuracy of the predictor. The resulting AUC can be interpreted as the probability that randomly-selected persons with schizophrenia in the community that exhibited risk of violence would score higher on the instrument than a randomly selected non-violent group. An AUC can range from 0 (perfect negative prediction), to .50 (chance prediction), to 1.0 (perfect positive prediction). In general, AUC values of .70 and above are considered moderate, and above .75 good (Douglas, Guy, and Weir, 2005).

Moreover, the receiver operating characteristic (ROC) curve was used to determine the cutoff of the TVRS score for distinguishing between low and high violence risk with appropriate sensitivity and specificity (Zweig and Campbell, 1993). An ROC curve is a graphical representation of the tradeoff between the false negative and false positive rates for every possible cutoff. The ROC analysis results in a plot of the true positive rate (sensitivity) against the false positive rate (1 minus specificity) for every possible cut-off score of the instrument. Equivalently, the ROC curve is the representation of the tradeoffs between sensitivity and specificity.

Sensitivity and specificity were estimated to determine whether the predictor variables were informative for practical application in identifying patients that were likely to exhibit violence. Sensitivity meant the proportion of violent patients that had been predicted to be violent. Specificity referred to the proportion of nonviolent patients that had been predicted to be nonviolent. The positive predictive value was the likelihood of the patient becoming violent after a high risk had been estimated. The negative predictive value was the likelihood of the patient not becoming violent after a low risk had been estimated. The total predictive was the model estimate of the correct classification of patients as low-risk or high-risk.

Sensitivity = Number of true positives
_____
Number of true positives + Number of false negatives

Specificity = Number of true negatives
_____
Number of true negatives + Number of false positives

Positive predictive value = Number of true positives
_____
Number of true positives + Number of false positives

Negative predictive value = Number of true negatives
_____
Number of true negatives + Number of false negatives

6. Reliability

Internal consistency reliability

Internal consistency reliability was used to examine the extent to which all of the instrument's items or subscale measured the same attribute. Internal consistency would be used Cronbach's alpha coefficient method to evaluate the second draft of the TVRS and its final draft. A value above .70 for the alpha of the new scale was considered satisfactory (Nunnally and Bernstein, 1994).

In summary, this chapter provided details of the research methodologies for constructing the TVRS and testing its construct validity and internal consistency reliability. In order to test the measurement model of this study, the instrument was developed and estimated with the collected data. The results of the statistical analysis from this study will be reported in chapter 4.

CHAPTER IV

RESULTS

This study developed the Thai Violence Risk Scale (TVRS) and tested its psychometric properties. This chapter reports the results of conducting item review by content validity analysis, conducting the preliminary item tryout by item review, determining the statistical properties of item scores by item analysis and EFA, designing and construct reliability and validity studies for the final form of the test by construct validity and reliability of the scale, and developing scoring and interpretation of the test score.

Results of conducting items review by content validity analysis

In this study, the item pool of the first draft of the TVRS was composed of 29 items covering two constructs of the violence risk concept, characteristics (26 items) and circumstances (3 items) of violence risk among persons with schizophrenia in the community. Then, nine mental health experts were invited to validate the content of all of the item pools of the first draft of the TVRS. The content validity of the first draft TVRS was determined by Items Content Validity Index (I-CVI) and the Scale Content Validity Index/Average Proportion (S-CVI/Ave).

Then, the 29 items of the pool of the first draft were revised, reshaped, or deleted following comments and suggestions of the experts. According to I-CVI<.78 (Lynn, 1986; McIntire and Miller, 2007; Polit and Beck, 2008), there were 2 items of characteristics component which were deleted.

After completing the content validity process, the number of 29 items in the item pool was reduced to 27 items, with a I-CVI score ranging from .78-1.0 and a S-CVI/Ave score = .86 in this step. As a result, the characteristics component comprised 24 items and the circumstances component comprised 3 items (Appendix E).

Results of conducting preliminary item tryout by item review

Before beginning the item analysis and EFA, the second draft of the TVRS was determined appropriate and clear in terms of wording through face-to-face interviews with 10 schizophrenic patients in order to improve the items that were difficult to understand or answer. After the item review, all items were not improved.

The time used for answering the TVRS varied, ranging from 5 minutes to 10 minutes. The time taken for process depended on the patients' age; the older they were, the more time they used. After completing the questionnaires, a briefing took place in which patients were invited to comment on each item and they offered suggestions. However, they made no comments and offered no suggestions.

Results of determining statistical properties of item scores by item analysis and EFA

1. Sociodemographic features of the samples for the item analysis and EFA (n=300)

The data for the item analysis and EFA were collected through the convenient sampling method at the Galya Rajanagarindra Institute, Mental Health

Department. The total sample of persons with schizophrenia comprises 82.00% men and 18.00% women between 17-60 years of age ($\bar{x}$=37.04, SD=9.38). Moreover, more than one-third of them (39.00%) were 31-40 years old. Most of them were Buddhist (97.70%) and single (70.60%). They had completed elementary school (37.30%), high school (29.70%), and secondary school (17.30%), respectively. More than half of the samples were unemployed (52.70%). Sample incomes per month ranged from 200-200,000 baht ($\bar{x}$=5,884.67, SD=16736.29) and most of them had incomes of less than 5,000 baht per month (67.70%).

Moreover, the age at first instance of psychiatric illness ranged from 13 to 55 years ($\bar{x}$=28.09, SD=9.15). A total of 40.70% of the samples were 21-30 years of age at first instance of psychiatric illness. The length of the psychiatric illness from 1 to 44 years ($\bar{x}$=9.78, SD=8.43) and a total of 30.30% of them had experienced a psychiatric illness more than 10 years. Most of them had previous inpatient hospitalizations (87.00%) and the number of previous inpatient hospitalizations ranged from 1 to 21 times ($\bar{x}$=3.01, SD=3.25). The samples had previous inpatient hospitalizations 1 time (27.00%), 2 times (19.00%), and more than 5 times (15.70%), respectively. The age when the samples were first admitted to the hospital in relation to a psychiatric illness ranged from 12 to 53 years ($\bar{x}$=25.05, SD=13.02) and more than one-third of them (36.00%) were 21 to 30 years of age when they were admitted to the hospital in relation to psychiatric illness. Regarding medication noncompliance before committing violence, 63.30% were medication noncompliant and length of medication noncompliance ranged from 2 to 730 days ($\bar{x}$=54.98, SD=120.64). Moreover, the samples were medication noncompliant from 15 to 30 days (16.70%).

Additionally, most of the samples had abused a substance before committing violence (68.70%), with alcohol (49.30%), amphetamines (10.30%), and marijuana (8.30%), respectively. Regarding violence history, they had committed violence ranging from 1-50 times ($\bar{x}$=4.15, SD=4.84) and the number of previous instances of violence was 2 times (22.00%), 3 times (19.70%), and 1 time (16.70%), respectively (Table 2).

Table 2 Sociodemographic features of samples for item analysis and EFA

(n=300)

Sociodemographic features	n	%
Age 17-60 years, $\bar{x}$=37.04, SD=9.38		
15-20 years	7	2.30
21-30 years	76	25.30
31-40 years	117	39.00
41-50 years	71	23.70
51-60 years	29	9.70
Gender		
Male	246	82.00
Female	54	18.00
Religion		
Buddhism	293	97.70
Christianity	5	1.70
Islam	2	0.60
Marital status		
Single	212	70.70
Married	35	11.70
Widowed	7	2.30
Divorced	46	15.30

Table 2 (Continued)

Sociodemographic features	n	%
Education level		
No education	8	2.70
Elementary school	112	37.30
Secondary school	52	17.30
High school	89	29.70
Diploma	14	4.70
Bachelor's degree	25	8.30
Occupational		
Unemployed	158	52.70
Student	5	1.70
Government officer	1	0.30
Employee	76	25.30
Merchant	38	12.60
Company officer	11	3.70
Agriculture	11	3.70
Income 200-200,000 baht/month, $\bar{x}$=5884.67, SD=16736.29		
Less than 5,000 baht/month	203	67.70
5,001-10,000 baht/month	79	26.30
10,001-15,000 baht/month	11	3.70
15,001-20,000 baht/month	1	0.30
20,001-25,000 baht/month	-	-
25,001-30,000 baht/month	2	0.70
More than 30,001 baht/month	4	1.30
Age at first instance of psychiatric illness 12-52 years, $\bar{x}$=28.09, SD=9.15		
12-20 years	76	25.30
21-30 years	122	40.70
31-40 years	61	20.30
41-50 years	37	12.30
51-60 years	4	1.40
Length of psychiatric illness 1-44 years, $\bar{x}$=8.90, SD=8.09		
0-2 years	66	22.10
3-5 years	61	20.30
6-10 years	82	27.30
More than 10 years	91	30.30
Previous psychiatric inpatient hospitalizations	261	87.00
Number of previous psychiatric inpatient hospitalizations		
1-21 times, $\bar{x}$=3.01, SD=3.25		
No	39	13.00
1 time	81	27.00
2 times	57	19.00
3 times	35	11.70
4 times	27	9.00
5 times	14	4.70
More than 5 times	47	15.60

Table 2 (Continued)

Sociodemographic features	n	%
Age at first of admitted in relation to psychiatric illness		
12-53 years, $\bar{x}$=25.05, SD=13.02		
No	39	13.00
12-20 years	60	20.00
21-30 years	108	36.00
31-40 years	54	18.00
41-50 years	35	11.70
51-60 years	4	1.30
Having a history of violence	300	100.00
Number of instances of history of violence		
1 time	50	16.70
2 times	66	22.00
3 times	59	19.70
4 times	37	12.20
5 times	44	14.70
More than 5 times	44	14.70
Medication noncompliance before committing violence	190	63.30
Length of medication noncompliance before committing violence		
2-730 days, $\bar{x}$=54.98, SD=120.64		
No	110	36.70
1-7 days	42	14.00
8-14 days	32	10.70
15-30 days	50	16.70
31-60 days	13	4.30
61-90 days	11	3.70
91-180 days	17	5.70
181-365 days	21	7.00
More than 365 days	4	1.20
Substance abuse before committing violence	206	68.70
Alcohol abuse	148	49.30
Amphetamine abuse	72	24.00
Marijuana abuse	56	18.70
Inhalants abuse	24	8.00
Cocaine abuse	1	0.30
Kratom abuse	13	14.30
Opiates abuse	3	1.00
Heroin abuse	10	3.30

2. Results of item analysis (n=300)

The item analysis was used to determine which items in the second draft of the TVRS were appropriate for constructing the final draft. The results of the item analysis are presented as follows.

Item distribution was examined by using mean, standard deviation, skewness, and kurtosis. For 27 items of the second draft scale, their means ranged from 0.07 to 2.54, with a standard deviation ranging from 0.38 to 1.49. Two statistic indicators, representing normal distribution, were skewness and kurtosis. In this study, there were 21 items that obtained skewness values falling inside the range of -1 to +1, which represented normal distribution (Hair et al., 1998). There were 19 items which had negatively high skewness, ranging from -.19 to -1.48.

Moreover, the items were examined using corrected item-total correlations. The results of the item analysis showed that 16 of all 27 items had an item-total correlation greater than .3. For the correlation matrix, when considered, there were 7 paired-items; 3/11, 3/15, 3/21, 8/26, 11/15, 15/21, and 19/20, which had inter-item correlation ≥ .7 (Appendix J).

The Cronbach's alpha coefficient of the second draft of the scale was high (α = .921), which indicated that a number of items of the second draft of scale would be reduced due to many redundant items. Additionally, the value of Cronbach's alpha coefficients, if any item was deleted, was also still high and ranged from 0.911 to 0.927.

In this study, guidances for selecting appropriate items were conducted from item distribution, the results of item analysis, and the number of samples.

Although the statistical data was very useful for item selection, the final decision to include or reject any items in the final scale was primarily based on human judgment regarding what the item analysis revealed (Nunnally and Bernstein, 1994). Therefore, the corrected item-total, the inter-item correlation, and the operational definition of the TVRS constructs were cooperated on making decision to select the items.

Based on the findings from the item analysis, 17 items were retained and 10 items were deleted (Appendix K). The final outcome of the scale construction phase was the final draft of the TVRS, which was composed of 17 items covering the two components of the violence risk concept—circumstances (2 items) and characteristics (15 items)—for violence risk among persons with schizophrenia in the community. The final draft scale also reflected all aspects of violence risk among persons with schizophrenia in the community provided in the operational definitions.

3. Results of the exploratory factor analysis (EFA)

The 17-item TVRS was conducted to EFA. Before conducting the EFA, the descriptive statistic was presented as follows:

3.1 Descriptive statistic of the 17-items of the TVRS (n=300)

The data were examined prior to analysis of the exploratory factor analysis. The descriptive statistics for the TVRS components, including characteristics, circumstances, and total score, are presented as follows.

The descriptive statistics of the TVRS are presented below. The average total TVRS score was approximately 32 ($\bar{x}$=31.59, SD=15.61). An inspection of the frequency distribution of the TVRS score further indicated that the

sample had a wide range of scores (0-50), within a possible range of 0-50, and a reasonably normal distribution. The skewness of the TVRS was -0.93, and the kurtosis was -0.63. The TVRS score obtained skewness values falling inside the range of -1 to +1, which represented normal distribution (Hair et al., 1998).

3.2 Testing assumption for EFA (n=300)

In testing assumptions for the EFA, normality, multicollinearity, the Bartlett's test of sphericity, and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy were examined.

3.2.1 Normality testing

In normality testing, the means of 17 items of the final draft of the TVRS ranged from 1.03 to 2.54, with a standard deviation ranging from 0.91 to 1.49. Each item score ranged from 0 to 3, and the excepted item 14 score ranged from 0 to 2. The skewness and kurtosis of the 17 items ranged from -0.91 to 0.66 and -1.97 to -1.17, respectively. There were 16 items that obtained skewness values falling inside the range of -1 to 1, which represented normal distribution (Hair et al., 1998). Only 1 item of 17 represented item characteristics of non-normal distribution. Moreover, all items were negative kurtosis which indicated platykurtic (Table 3).

Table 3 Descriptive statistic of the 17 item-TVRS (n=300)

17 item-TVRS	Mean	SD	Min	Max	Skewness	Kurtosis
Item1	1.64	1.49	0	3	-0.188	-1.978
Item2	1.11	1.45	0	3	.541	-1.791
Item3	2.54	1.08	0	3	-1.943	-1.752
Item4	1.89	1.45	0	3	-0.541	-1.719
Item5	2.01	1.41	0	3	-0.727	-1.482
Item6	1.03	1.43	0	3	0.663	-1.571
Item7	1.98	1.42	0	3	-0.679	-1.549
Item8	1.89	1.45	0	3	-0.541	-1.719
Item9	1.91	1.45	0	3	-0.571	-1.685
Item10	1.94	1.44	0	3	-0.617	-1.631
Item11	2.03	1.40	0	3	-0.759	-1.433
Item12	2.10	1.38	0	3	-0.877	-1.239
Item13	2.09	1.38	0	3	-0.860	-1.269
Item14	1.41	0.91	0	2	-0.912	-1.175
Item15	1.93	1.44	0	3	-0.601	-1.649
Item16	2.00	1.42	0	3	-0.711	-1.505
Item17	2.09	1.38	0	3	-0.860	-1.269

3.2.2 Multicollinearity testing

For the multicollinearity testing, bivariate muliticollinearity was checked by examining the correlation matrix among individual items included in the analysis. Bivariate multicollinearity occurs when correlations of any item is greater than .85 (Munro and Page, 1993). Moreover, bivariate multicollinearity occurs when the tolerance value is less than 0.01 (Hair et al., 2006) and the variance inflation factor (VIF) is close to 10 (Nonglak Wiratchai, 1999).

In this study, however, evidence of multicollinearity was not found, and correlation of any item was less than .85 (Table 4). Moreover, tolerance values were not close to 0 (ranging from 0.318 to 0.801) and the VIF values were less than 10 (ranging from 1.249 to 3.334) (Table 5). Thus, the tolerance and VIF values indicated no evidence of muliticollinearity.

Table 4 Inter correlation matrix of the 17-itemTVRS (n=300)

	Item1	Item2	Item3	Item4	Item5	Item6	Item7	Item8	Item9	Item10	Item11	Item12	Item13	Item14	Item15	Item16	Item17
Item1	1																
Item2	.531**	1															
Item3	.151**	.154**	1	.													
Item4	.134*	.201**	.249**	1													
Item5	.144*	.156**	.311**	.607**	1	.											
Item6	.193**	.217**	.171**	.351**	.254**	1											
Item7	.025	-.004	.280**	.252**	.334**	.148*	1	.									
Item8	.190**	.158**	.306**	.743**	.607**	.409**	.237**	1									
Item9	.120*	.120*	.256**	.727**	.619**	.371**	.365**	.742**	1	.							
Item10	.167**	.119*	.324**	.603**	.653**	.285**	.294**	.603**	.645**	1							
Item11	.086	.131*	.279**	.607**	.606**	.305**	.346**	.636**	.604**	.622**	1						
Item12	.091	.110	.287**	.598**	.592**	.320**	.298**	.583**	.640**	.627**	.636**	1					
Item13	.127*	.160**	.323**	.591**	.663**	.324**	.338**	.561**	.602**	.589**	.614**	.644**	1				
Item14	.178**	.145*	.335**	.613**	.622**	.343**	.310**	.598**	.609**	.565**	.603**	.681**	.737**	1			
Item15	.105	.124*	.243**	.712**	.661**	.348**	.318**	.669**	.711**	.629**	.601**	.606**	.583**	.575**	1	.	
Item16	.038	.059	.190**	.469**	.451**	.318**	.284**	.498**	.480**	.454**	.630**	.525**	.441**	.445**	.463**	1	
Item17	.157**	.130*	.323**	.591**	.740**	.294**	.353**	.606**	.602**	.665**	.645**	.628**	.606**	.610**	.614**	.472**	1

*p<.05, **p<.01 (2-tailed)

Table 5 Assessment for multicollinearity among the 17-item TVRS (n=300)

The 17 item-TVRS	Tolerance	VIF
Item1	0.672	1.488
Item2	0.669	1.495
Item3	0.801	1.249
Item4	0.318	3.146
Item5	0.330	3.026
Item6	0.762	1.313
Item7	0.764	1.309
Item8	0.306	3.269
Item9	0.300	3.334
Item10	0.397	2.521
Item11	0.357	2.798
Item12	0.379	2.640
Item13	0.355	2.815
Item14	0.345	2.896
Item15	0.352	2.837
Item16	0.555	1.802
Item17	0.364	2.890

3.2.3 Bartlett's test of sphericity and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy

In this study, the results showed that 17 items of the TVRS were significant (χ^2 =3038.051, *df*=136, and *p*=.000). This means that 17 items had a multivariate normal distribution and that the correlation matrix was not an identity matrix. Moreover, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test showed that the size of the overall KMO was 0.941 (Table 6). This value was considered an excellent indication for using EFA because the value was greater than 0.8 (Dixon, 2005; Pett et al., 2003).

Communality, a measure of how much of the variability in a given variable is explained by all of the factors in the analysis (Munro, 2001), ranged from .345 to .714 (Table 7). Thus, the items had very acceptable communalities with a value greater than .20 (Tabachnick and Fidell, 2001).

In conclusion, regarding the various testing assumptions for the EFA, the results showed that the data were sufficient for the EFA.

Table 6 Bartlett's test of sphericity and KMO for EFA (n=300)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.941
Bartlett's Test of Sphericity	Approx. Chi-Square	3038.051
	df	136
	Sig.	.000

3.3 Results of the EFA

According to the KMO, the value was .941. A KMO value >.90 is considered an excellent indication for using factor analysis. A principle components analysis was selected as the factor extraction technique, as recommended by Nunnally and Bernstein (1994). Varimax orthogonal rotation was used to maximize the variance among the loadings on each factor.

When the principal component analysis was initially performed on the second draft of the TVRS data to extract two factors based on the literature review. The factor solution is presented in Table 7.

The first factor included fifteen of the original items developed to examine the characteristics component of this factor. The loadings of items on this factor ranged from .413 to .831, with an eigenvalue of 7.93, accounted for 46.65% of variance, and cumulative 46.65% of variance.

The second factor contained 2 items that were proposed to measure the circumstances component. Factor loadings ranged from .824 to .825, with an eigenvalue of 1.89, accounted for 11.10% of variance, and cumulative 57.76% of variance.

Table 7 Factor loadings, Eigenvalues, Percent of Variance, and Communallities for Varimax factor Rotation

Factors/Items	Eigenvalues	Percent of Variance	Comulative % of variance	Factor loading	Communalities
Factor I Characteristics	7.93	46.65%	46.65%		
Cha3				.413	.633
Cha4				.814	.714
Cha5				.811	.665
Cha6				.460	.345
Cha7				.434	.570
Cha8				.818	.712
Cha9				.831	.714
Cha10				.794	.632
Cha11				.805	.661
Cha12				.801	.653
Cha13				.796	.642
Cha14				.800	.643
Cha15				.811	.685
Cha16				.644	.450
Cha17				.810	.666
Factor II Circumstances	1.89	11.10%	57.76%		
Cir1				.824	.764
Cir2				.825	.728

Note:
Cha   = Characteristics
Cir   = Circumstances

Results of designing and construct reliability and validity studies

1. Sociodemographic features of the samples for construct validity and reliability (n=604)

The data for the construct validity and reliability were collected through a convenient sampling method in the four regions of Thailand discussed earlier. The total sample of persons with schizophrenia in the community was comprised of 75.50% men and 24.50%) women between 18-60 years of age ($\bar{x}$=36.77, SD=9.36) and most of them were 31-40 years old (41.10%). Moreover, most of them were Buddhist (97.80%) and single (67.90%). They had completed elementary school (38.40%), high school (23.20%), and secondary school (20.50%), respectively. A total of 46.00% of the samples were unemployed. Regarding income, the sample incomes per month ranged from 300-200,000 baht ($\bar{x}$=4942.38, SD=9715.41) and most of them had incomes of less than 5,000 baht per month (71.00%).

Moreover, the age at first incidence of psychiatric illness ranged from 13 to 55 years ($\bar{x}$=26.79, SD=8.83) and a total of 41.90% of them were 21-30 years of age at first incidence of psychiatric illness. Regarding the length of the psychiatric illness, the length of psychiatric the illness of the samples ranged from 1 to 44 years ($\bar{x}$=9.86, SD=8.18) and 36.90% of them had a length of psychiatric illness more than 10 years. Regarding previous inpatient hospitalizations, a total of 78.30% of the samples had previous inpatient hospitalizations, the number of previous inpatient hospitalizations ranged from 1-25 times ($\bar{x}$=2.68, SD=3.28), and they had previous

inpatient hospitalizations 1 time (23.70%), 2 times (18.40%), and more than 5 times (12.10%), respectively. Regarding age at first hospital admission in relation to psychiatric illness, the samples ranged from 12-57 years ($\bar{x}$=21.76, SD=13.86) and more than one-third of them (33.80%) were 21 to 30 years of age when first of admitted in relation to psychiatric illness. Regarding medication noncompliance, a total of 62.70% of the samples were medication noncompliant, the length of their medication noncompliance ranged from 1 to 4,380 days ($\bar{x}$=96.19, SD=309.36), and the samples were medication noncompliant at between 15 and 30 days (17.70%).

Additionally, more than half of the samples (59.30%) had a substance use history with alcohol (47.80%), amphetamines (27.30%), and marijuana (25.00%), respectively, and a total of 48.80% of them had abused a substance during the study, with alcohol (39.70%), amphetamines (14.70%), and marijuana (13.20%), respectively. In addition, 49.80% of the samples had committed violence ranging from 1 to 12 times ($\bar{x}$=1.93, SD=1.29). The incidence of previous violence was 1 time (27.20%), 2 times (12.10%), and 3 times (6.00%), respectively (Table 8).

Table 8 Sociodemographic features of the samples for construct validity and reliability (n=604)

Sociodemographic features	n	%
Age 18-60 years, $\bar{x}$ = 36.77, SD=9.36		
15-20 years	13	2.10
21-30 years	155	25.70
31-40 years	248	41.10
41-50 years	128	21.20
51-60 years	60	9.90
Gender		
Male	456	75.50
Female	148	24.50

Table 8 (Continued)

Sociodemographic features	n	%
Religion		
Buddhism	591	97.80
Christianity	7	1.20
Islam	6	1.00
Marital status		
Single	410	67.90
Married	108	17.90
Widowed	19	3.10
Divorced	67	11.10
Education level		
No education	21	3.50
Elementary school	232	38.40
Secondary school	124	20.50
High school	140	23.20
Diploma	26	4.30
Bachelor's degree	56	9.30
Master's degree	5	0.80
Occupation		
Unemployed	278	46.00
Student	10	1.70
Government officer	11	1.80
Employee	127	21.00
Merchant	70	11.60
Company officer	8	1.30
Agriculture	100	16.60
Income 300-200,000 baht/month $\bar{x}$ =4942.38, SD=9715.41		
Less than 5,000 baht/month	429	71.00
5,001-10,000 baht/month	130	21.40
10,001-15,000 baht/month	24	4.00
15,001-20,000 baht/month	10	1.70
20,001-25,000 baht/month	1	0.20
25,001-30,000 baht/month	6	1.00
More than 30,001 baht/month	4	0.70
Age at first instance of psychiatric illness 13-55 years, $\bar{x}$ =26.79, SD=8.83		
12-20 years	182	30.10
21-30 years	253	41.90
31-40 years	120	19.90
41-50 years	39	6.50
51-60 years	10	1.60
Length of psychiatric illness 1-44 years, $\bar{x}$ =9.86, SD=8.18		
0-2 years	117	19.40
3-5 years	108	17.90
6-10 years	156	25.80
More than 10 years	223	36.90

Table 8 (Continued)

Sociodemographic features	n	%
Previous psychiatric inpatient hospitalizations	473	78.30
Number of previous psychiatric inpatient hospitalizations		
1-25 times, $\bar{x}$=2.68, SD=3.28		
No	131	21.70
1 time	143	23.70
2 times	111	18.40
3 times	66	10.90
4 times	52	8.60
5 times	28	4.60
More than 5 times	73	12.10
Age at first of admitted in relation to psychiatric illness		
12-57 years, $\bar{x}$=21.76, SD=13.86		
No	131	21.70
12-20 years	123	20.40
21-30 years	204	33.80
31-40 years	102	16.90
41-50 years	37	6.00
51-60 years	7	1.20
Having history of violence	301	49.80
Number of instances of history of violence 1-12 times, $\bar{x}$=1.93, SD=1.29		
No	303	50.20
1 time	164	27.20
2 times	73	12.10
3 times	36	6.00
4 times	10	1.50
5 times	6	1.00
More than 5 times	12	2.00
Medication noncompliance	379	62.70
Length of medication noncompliance 1-4,380 days, $\bar{x}$=96.19, SD=309.36		
No	225	37.30
1-7 days	81	13.40
8-14 days	49	8.10
15-30 days	107	17.70
31-60 days	23	3.80
61-90 days	16	2.60
91-180 days	20	3.30
181-365 days	58	9.60
More than 365 Days	25	4.20

Table 8 (Continued)

Sociodemographic features	n	%
Substance use history	358	59.30
Alcohol abuse	289	47.80
Amphetamine abuse	165	27.30
Marijuana abuse	151	25.00
Inhalants abuse	73	12.10
Cocaine abuse	3	0.50
Kratom abuse	60	9.90
Opiates abuse	5	0.80
Heroin abuse	19	3.10
Substance abuse	295	48.80
Alcohol abuse	240	39.70
Amphetamine abuse	89	14.70
Marijuana abuse	80	13.20
Inhalants abuse	33	5.50
Kratom abuse	33	5.50
Heroin abuse	2	0.30

2. Sociodemographic features of the samples for criterion-related validity (n=128)

The data for the criterion-related validity were the same as the data collected through the convenient sampling method at the Galya Rajanagarindra Institure, one of four psychiatric hospitals, for testing confirmatory factor analysis. A total sample of persons with schizophrenia in the community was men, 74.20%, and women, 25.80%. They were between 20-60 years of age ($\bar{x}$=37.35, SD=9.61) and most of them were 31-40 years old (40.60%). Moreover, most of them were Buddhist (96.90%) and single (67.20%). They had completed elementary school (28.90%), high school (28.10%), and secondary school (19.50%), respectively. A total of 51.60% of the samples were unemployed. Regarding income, the sample incomes per month

ranged from 300 to 200,000 baht ($\bar{x}$=6715.62, SD=7923.65) and most of them had

incomes of less than 5,000 baht per month (71.10%).

In addition, the age at which the samples experienced the first instance

of psychiatric illness ranged from 13 to 53 years ($\bar{x}$=28.17, SD=9.57) and a total of

38.30% of them were 21-30 years of age at their first psychiatric illness. Regarding

the length of the psychiatric illness, the samples ranged from 1 to 44 years ($\bar{x}$=9.16,

SD=7.86) and 31.30% of them were mentally ill for more than 10 years. Regarding

previous inpatient hospitalizations, a total of 78.90% of the samples had previous

inpatient hospitalizations, the number of previous inpatient hospitalizations ranged

from 1 to 21 times ($\bar{x}$=2.56, SD=3.18), and they had previous inpatient

hospitalizations at 1 time (25.80%), 2 times (20.30%), 3 times, and more than 5 times

(10.90%), respectively. Regarding the age when they were first admitted to the

hospital in relation to psychiatric illness, the samples ranged from 15 to 50 years

($\bar{x}$=24.38, SD=11.49) and more than one-third of them (35.20%) were between 21

and 30 years of age. Regarding medication noncompliance, a total of 70.30% of the

samples were medication noncompliant, and the length of their medication

noncompliance ranged from 2 to 3,650 days ($\bar{x}$=157.08, SD=403.61); additionally,

the samples were medication noncompliant between 15 and30 days (21.10%).

Furthermore, more than half of the samples (64.10%) had a substance

use history with alcohol (43.80%), marijuana (30.50%), and amphetamine abuse

(16.40%), respectively, and a total of 58.60% of them abused a substance during the

study, with alcohol (38.30%), marijuana (21.90%), and amphetamine abuse (11.70%),

respectively. In addition, 36.70% of the samples had committed violence, ranging

from 1-12 times ($\bar{x}$=1.19, SD=1.76). The number of instances of previous violence

was 1 time (40.40%), 2 times (23.40%), and 3 times (17.0%), respectively (Table 9).

Table 9 Sociodemographic features of the samples for criterion-related validity

(n=128)

Sociodemographic features	n	%
Age 20-60 years, $\bar{x}$ = 37.35, SD=9.61		
15-20 years	3	2.30
21-30 years	30	23.40
31-40 years	52	40.60
41-50 years	31	24.20
51-60 years	12	9.50
Gender		
Male	95	74.20
Female	33	25.80
Religion		
Buddhism	124	96.90
Christianity	3	2.30
Islam	1	0.80
Marital status		
Single	86	67.20
Married	21	16.40
Widowed	2	1.60
Divorced	19	14.80
Education level		
No education	7	5.50
Elementary school	37	28.90
Secondary school	25	19.50
High school	36	28.10
Diploma	6	4.70
Bachelor's degree	16	12.50
Master's degree	1	0.80
Occupation		
Unemployed	66	51.60
Student	4	3.10
Government officer	4	3.10
Employee	27	21.10
Merchant	18	14.00
Company officer	1	0.80
Agriculture	8	6.30

Table 9 (Continued)

Sociodemographic features	n	%
Income 300-200,000 baht/month $\bar{x}$ =6392.96, SD=18040.17		
Less than 5,000 baht/month	91	71.10
5,001-10,000 baht/month	24	18.80
10,001-15,000 baht/month	7	5.30
15,001-20,000 baht/month	2	1.60
20,001-25,000 baht/month	1	0.80
25,001-30,000 baht/month	2	1.60
More than 30,001 baht/month	1	0.80
Age at first instance of psychiatric illness		
13-53 years, $\bar{x}$ =28.17, SD=9.57		
12-20 years	34	26.60
21-30 years	49	38.30
31-40 years	33	25.80
41-50 years	7	5.50
51-60 years	5	3.80
Length of psychiatric illness 1-44 years, $\bar{x}$ =9.16, SD=7.86		
0-2 years	11	16.40
3-5 years	31	24.20
6-10 years	36	28.10
More than 10 years	40	31.30
Previous psychiatric inpatient hospitalizations	101	78.90
Number of previous psychiatric inpatient hospitalizations		
1-21 times, $\bar{x}$ =2.56, SD=3.18		
No	27	21.10
1 time	33	25.80
2 times	26	20.30
3 times	14	10.90
4 times	9	7.10
5 times	5	3.90
More than 5 times	14	10.90
Age at first admitted in relation to psychiatric illness		
15-50 years, $\bar{x}$ =24.38, SD=11.49		
12-20 years	33	25.80
21-30 years	45	35.20
31-40 years	30	23.40
41-50 years	7	5.40
51-60 years	13	10.20
Having a history of violence	47	36.70

Table 9 (Continued)

Sociodemographic features	n	%
Number of previous instances of violence 1-12 times, $\bar{x}$=1.19, SD=1.76		
1 time	19	40.40
2 times	11	23.40
3 times	8	15.00
4 times	6	11.60
5 times	1	2.10
More than 5 times	4	7.50
Medication noncompliance	90	70.30
Length of medication noncompliance		
2-3,650 days, $\bar{x}$=157.08, SD=403.61		
No	38	29.70
1-7 days	15	11.70
8-14 days	5	3.90
15-30 days	27	21.10
31-60 days	7	5.50
61-90 days	2	1.60
91-180 days	5	3.90
181-365 days	19	14.80
More than 365 Days	10	7.80
Substance use history	82 (64.1)	64.10
Alcohol abuse	56 (43.8)	43.80
Amphetamine abuse	21 (16.4)	16.40
Marijuana abuse	39 (30.5)	30.50
Inhalants abuse	13 (10.2)	10.20
Cocaine abuse	-	-
Kratom abuse	9	6.80
Opiates abuse	-	-
Heroin abuse	3	2.30
Substance abuse	75	58.60
Alcohol abuse	49	38.30
Amphetamine abuse	15	11.70
Marijuana abuse	28	21.90
Inhalants abuse	7	5.50
Cocaine abuse	-	-
Kratom abuse	7	5.50
Opiates abuse	-	-
Heroin abuse	-	-

3. Second order confirmatory factor analysis

The 17-item TVRS was conducted to test construct validity using second order confirmatory factor analysis. Before testing construct validity, descriptive statistic and testing assumption for the CFA were presented as follows.

3.1 Descriptive statistic of the 17-item TVRS

The data were examined prior analysis to the confirmatory factor analysis. Descriptive statistics for the TVRS components, including characteristic, circumstances, and total score, are presented as follows.

Regarding descriptive statistics of the TVRS, the average TVRS total score was approximately 24 ($\bar{x}$=24.55, SD=14.49). An inspection of the frequency distribution of the TVRS score further indicated that the sample had a wide range of scores (0-50), within a possible range of 0-50, and a reasonably normal distribution. The skewness of the TVRS was 0.14 and kurtosis was -1.36.

3.2 Testing assumption for the CFA

The testing assumptions for CFA, normality, multicollinearity, Bartlett's test of sphericity, and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy were examined.

3.2.1 Normality testing

In the normality testing, the means of the 17 items of the final draft of the TVRS ranged from 0.69 to 2.36, with a standard deviation

ranging from 0.96 to 1.50. Each item score ranged from 0 to 3, excepted item 14, here

the score ranged from 0 to 2. The skewness and kurtosis of the 17 items ranged from -

1.40 to 1.27 and -2.00 to -0.04, respectively. Fifteen items obtained skewness values

falling inside the range of -1 to 1, which represented normal distribution (Hair ET

AL., 1998). Only 2 of the 17 items revealed characteristics of non-normal distribution.

Moreover, all items were negative kurtosis which indicated platykurtic (Table 10).

Table 10 Descriptive statistic of 17-item TVRS (n=604)

17 item-TVRS	Mean	SD	Min	Max	Skewness	Kurtosis
Item1	2.36	1.23	0	3	-1.401	-0.037
Item2	2.03	1.40	0	3	-0.760	-1.428
Item3	1.73	1.48	0	3	-0.309	-1.911
Item4	1.27	1.48	0	3	0.309	-1.911
Item5	1.28	1.48	0	3	0.302	-19.915
Item6	0.69	1.27	0	3	1.274	-0.377
Item7	1.21	1.47	0	3	0.399	-1.847
Item8	1.52	1.50	0	3	-0.040	-2.005
Item9	1.57	1.50	0	3	-0.093	-1.988
Item10	1.36	1.49	0	3	0.187	-1.972
Item11	1.33	1.49	0	3	0.234	-1.952
Item12	1.27	1.48	0	3	0.316	-1.907
Item13	1.07	1.44	0	3	0.603	-1.642
Item14	1.29	0.96	0	2	-0.603	-1.642
Item15	1.27	1.48	0	3	0.316	-1.907
Item16	1.85	1.46	0	3	-0.478	-1.778
Item17	1.46	1.50	0	3	0.053	-2.004

3.2.2 Multicollinearity testing

In the multicollinearity testing, the bivariate

muliticollinearity was checked by examining the correlation matrix among individual

items included in the analysis. Bivariate multicollinearity occurs when correlations of

any item are greater than .85 (Munro and Page, 1993). Moreover, bivariate

multicollinearity occurs when the tolerance value is less than 0.01 (Hair et al., 2006) and the variance inflation factor (VIF) is close to 10 (Nongluk Wiratchai, 1999).

In this study, however, evidence of multicollinearity was not found; the correlation of any item was less than .85 (Table 11). Moreover, tolerance values were not close to 0 (ranging from 0.142 to 0.745) and the VIF values were less than 10 (ranging from 1.343 to 7.056) (Table 12). Thus, the tolerance and VIF values indicated no evidence of muliticollinearity.

3.2.3 Bartlett's test of sphericity and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy

In this study, the results showed that 17 items of the TVRS were significant (χ^2 =4192.495, *df*=136, and *p*=.000). This means that 17 items had normal multivariate distribution and the correlation matrix was not an identity matrix. Moreover, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy test showed that the size of the overall KMO was 0.905 (Table 13). This value was considered an excellent indication for using CFA because the value was greater than 0.8 (Dixon, 2005; Pett et al., 2003).

In conclusion, regarding the various testing assumptions for the CFA, the results showed that the data were sufficient for the CFA.

Table 11 Inter correlation matrix of the 17-item TVRS (n=604)

	Item1	Item2	Item3	Item4	Item5	Item6	Item7	Item8	Item9	Item10	Item11	Item12	Item13	Item14	Item15	Item16	Item17
Item1	1																
Item2	.448**	1															
Item3	.040	-.030	1														
Item4	.265**	.186**	.038	1	.												
Item5	.074	.098*	.428**	.225**	1												
Item6	.143**	.180**	.218**	.091*	.180**	1											
Item7	.291**	.173**	.123**	.285**	.171**	.389**	1										
Item8	.288**	.240**	.176**	.393**	.292**	.398**	.467**	1									
Item9	.299**	.257**	.125**	.404**	.281**	.383**	.513**	.589**	1								
Item10	.299**	.217**	.142**	.323**	.270**	.396**	.514**	.547**	.683**	1							
Item11	.293**	.262**	.138**	.344**	.278**	.370**	.534**	.539**	.616**	.602**	1						
Item12	.308**	.206**	.192**	.296**	.231**	.318**	.413**	.456**	.581**	.608**	.643**	1					
Item13	.311**	.272**	.176**	.269**	.302**	.321**	.391**	.480**	.544**	.545**	.633**	.709**	1				
Item14	.192**	.097*	.068	.256**	.195**	.106**	.286**	.260**	.301**	.233**	.328**	.320**	.343**	1			
Item15	.241**	.222**	.102*	.325**	.326**	.284**	.358**	.429**	.534**	.507**	.623**	.566**	.611**	.264**	1		
Item16	.150**	.071	.228**	.161**	.273**	.292**	.266**	.329**	.371**	.303**	.408**	.344**	.360**	.245**	.317**	1	
Item17	.100*	.101*	.370**	.162**	.674**	.190**	.180**	.252**	.300**	.297**	.280**	.241**	.238**	.171**	.261**	.279**	1

*p<.05, **p<.01 (2-tailed)

Table 12 Assessment for multicollinearity among the 17 items of the TVRS (n=604)

The 17 item-TVRS	Tolerance	VIF
Item1	0.745	1.343
Item2	0.736	1.359
Item3	0.463	2.162
Item4	0.711	1.407
Item5	0.233	4.293
Item6	0.326	3.063
Item7	0.241	4.152
Item8	0.227	4.403
Item9	0.175	5.726
Item10	0.164	6.086
Item11	0.160	6.253
Item12	0.142	7.056
Item13	0.403	2.478
Item14	0.198	5.053
Item15	0.254	3.933
Item16	0.211	4.744
Item17	0.745	1.343

Table 13 Bartlett's test of sphericity and KMO for the CFA (n=604)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.905
Bartlett's Test of Sphericity	Approx. Chi-Square	4192.495
	df	136
	Sig.	.000

3.3 Measurement model of the TVRS

The TVRS was conceptualized as a unidimensional scale. The measurement model of the scale was identified as having 17 items with 2 unidimensional components, as shown in Figure 3.

For good understanding of the entire model, the figures demonstrated in this study, and symbols of all indicator names, are presented as follows:

Cha = Characteristics
Cir = Circumstances
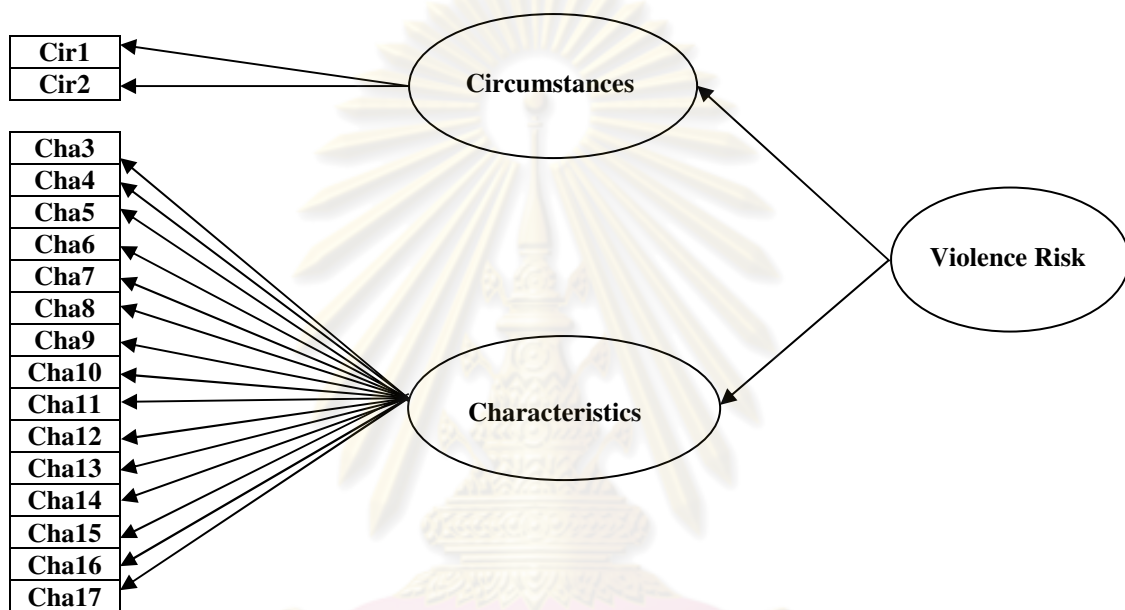
Figure 4 The measurement model of the TVRS

3.4 Model specification and identification

In this study, the measurement model of violence risk was designed to be illustrated by two first-order factors and a single second-order factor. Thus, the hypothesized model of the factor structure of the TVRS was an over-identified model. The model hypothesized specified as follows:

1. The 17 item indicators were hypothesized as having measurement error, and two factors were uncorrelated with each other.

2. Response to the TVRS could be explained by two first-order factors (characteristic and circumstances).

3. Each item would have a non-zero loading on the first-order factor, which it was designed to measure, and zero loadings on another first-order factor.

4. Error terms associated with each item would be uncorrelated.

5. Co-variation among the two factors would be explained fully by their regression on the second-order factors.
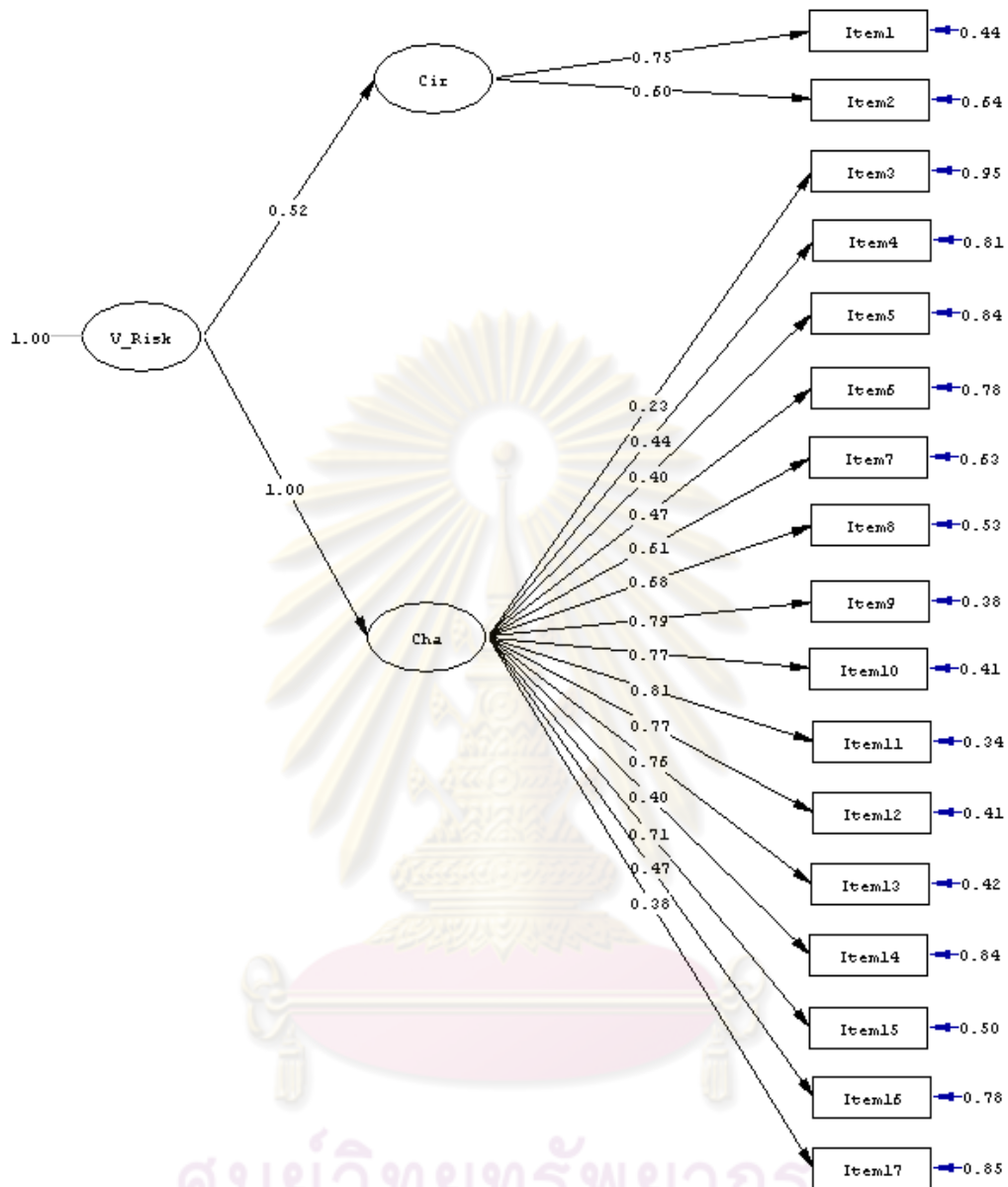
Chi-Square=870.74, df=118, P-value=0.00000, RMSEA=0.103

Figure 5 The hypothesized factor measurement model of the TVRS

3.4.1 Assessment of overall model fit

The hypothesized factor structure model of the TVRS (Figure 4) was tested using second-order factor analysis. The results showed inacceptable model fit with the data ($\chi^2 = 870.74$, $p = 0.00$, $df = 118$, $\chi^2/df = 7.38$, GFI = 0.855, CFI = 0.925, AGFI = 0.812, RMSEA = 0.103). It was indicated that the hypothesized model did not fit a possible data-model (Table 14). Therefore, the hypothesized model was modified and retested.

3.4.2 Assessment of measurement model fit

For the hypothesized model, although the overall model was misfit, the factor loadings of all factors ranging from 0.17 to 0.83 were statistically significant ($p < .05$).

3.4.3 Model modification

The hypothesized model was modified terms in order to reduce the residual values of each indicator by using two methods: allowing relationships of error terms between possible paired indicators, and allowing possible relationships among the two factors.

Regarding model modification, the researcher judged to free error terms of each paired item under rationale consideration. The results showed that there were 48 paired indicators where the error possibly correlated.

After modifying the model, the results of the second-order CFA showed that all indices of the overall model fit of the modified model met the criteria for supporting good model fit. There were low Chi-square values resulting in a non-significant difference level of .05. The χ^2/df ratio fell within the recommended level of 2, with GFI and AGFI values close to 1.00. The RMSEA value was close to zero. After

modifying the model, the results indicated that all indices of overall model fit of the modified model met the criteria for supporting the good model fit (χ^2=87.08, *df*=70, *p*=0.00, χ^2/*df*=1.24, GFI=0.983, AGFI=0.963, CFI=0.998, RMSEA=0.020) (Table 14, Appendix L).

Table 14 Fit indices of hypothesized and modified factor structure of the TVRS

(n=604)

Goodness of Fit Statistics	Values	
	Hypothesized model	**Modified model**
Chi-Square	870.74	87.08
	(*p*=0.00)	(*p*=0.08)
Degree of Freedom (df)	118	70
	(χ^2/*df* = 24.989)	(χ^2/*df*=1.24)
Goodness of Fit Index (GFI)	0.844	0.983
Root Mean Square Error of Approximation (RMSEA)	0.103	0.020
Comparative Fit Index (CFI)	0.915	0.998
Adjusted Goodness of Fit Index (AGFI)	0.797	0.963

These results indicated that the modified factor structure model was congruent with the empirical data, and under investigation the factor structure in the modified model was possible to be the factor structure of the TVRS construct (Figure 5). The results of the assessment of the model fit of the modified model were reported in two parts: the first level of the CFA and the second level of the CFA.

Chi-Square=87.08, df=70, P-value=0.08139, RMSEA=0.020
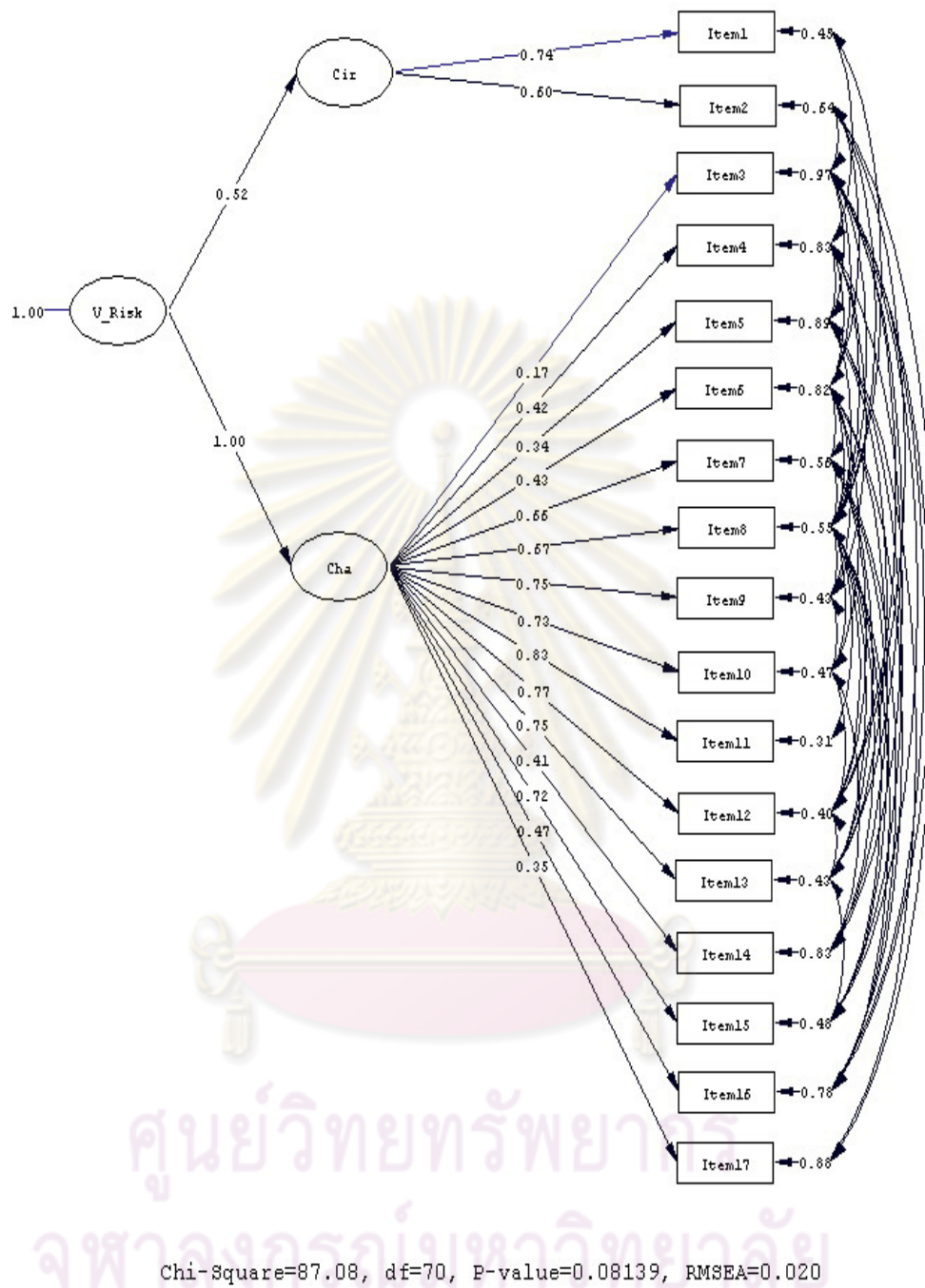
Figure 6 The modified measurement model of the TVRS

3.4.4 The first level of the CFA

Moreover, there were 17 indicators and 2 factors in the first level of the CFA, as shown in Figure 6. The results showed that the factor loadings of all 17 indicators, ranging from 0.166 to 0.829, were statistically significant. There was one indicator, item 3 (male gender), whose factor loading was low (b=0.167) as show in Table 15.

In addition, the squared multiple correlations (R^2) for all indicators of both constructs ranged from 0.028 to 0.688. The R^2 of 10 indicators were moderate indicator except for male gender, antisocial personality disorder, history of substance abuse, having history of violence during 6 months, lack of insight, medication noncompliance, and substance abuse, which had a low R^2 value as show in Table 15.

Table 15 Analysis results for the violence risk measurement model

Construct and Indicators	b	t-value	SE$_b$	R^2	SS	b$_{sc}$
Circumstances						
Cir1 (poor family relationships)	0.738	-	-	0.547	0.738	0.739
Cir2 (expressed emotional in family)	0.600	7.562***	0.079	0.360	0.600	0.600
Characteristics						
Cha3 (male gender)	0.167	-	-	0.028	0.166	0.167
Cha4 (antisocial personality disorder)	0.415	3.614***	0.115	0.173	0.415	0.415
Cha5 (history of substance abuse)	0.335	4.147***	0.081	0.112	0.335	0.335
Cha6 (having history of violence during 6 months)	0.427	3.764***	0.113	0.182	0.427	0.427
Cha7 (weapon availability)	0.664	3.766***	0.176	0.441	0.664	0.664
Cha8 (aggressive behavior)	0.673	3.448***	0.195	0.453	0.672	0.673
Cha9 (delusion)	0.753	3.801***	0.198	0.567	0.752	0.753
Cha10 (hallucination)	0.731	3.794***	0.193	0.534	0.731	0.731
Cha11 (excitement)	0.829	3.817***	0.217	0.688	0.829	0.829
Cha12 (suspicious)	0.773	3.872***	0.200	0.596	0.773	0.772
Cha13 (hostility)	0.754	3.852***	0.196	0.569	0.754	0.754
Cha14 (lack of insight)	0.414	3.612***	0.114	0.171	0.414	0.413
Cha15 (symptom of mania)	0.722	3.776***	0.191	0.521	0.722	0.722
Cha16 (medication noncompliance)	0.475	3.786***	0.125	0.225	0.475	0.474
Cha17 (substance abuse)	0.347	4.021***	0.086	0.120	0.347	0.347

***p<.001	b	= factor loading	b$_{sc}$	= completely standardized solution
Cha = Characteristics	SE$_b$	= standard error	R^2	= square multiple correlation
Cir = Circumstances	ss	= standardized solution		

3.4.5 The second level of CFA

Table 16 illustrates the loading with t-values and squared multiple correlations of both constructs for violence risk measurement. Based on an accepted level of .05, the t-value test statistic needed to be 1.96 or more before the hypothesis could be rejected. The results showed that all of the regression weights between the two constructs and the Thai violence risk scale (TVRS) ranged from 0.52 to 1.00 and were statistically significant at $p <$.05. It was indicated that characteristics and circumstances were actual predictors of the TVRS. In the case of the construct reliability of the two constructs, it was found that their squared multiple correlations were 0.275 and 1.00, respectively. There was one construct, circumstances, which was at an unsatisfactory level of construct reliability (R^2<0.7).

Table 16 Factor loadings and reliability of construct

Construct	Factor loading	t-value	Standard error	R^2
Circumstances	0.524	9.488	0.055	0.275
Characteristics	1.000	3.817	0.262	1.00

In summary, the findings revealed that the measurement model fit the empirical data. The Chi-square test showed low value with a non-significant level. All CFI, GFI and AGFI values were close to 1.0 and the RMSEA value was less than .08. Thus, the measured model's indices were acceptable. The classical testing approach for reliability and validity provided adequate support for the TVRS measure.

4. Predictive validity

An ROC analysis was conducted to examine the predictive accuracy of the TVRS measures for violence outcome. The time period for the samples was 2 months. The total sample of 128 included 47 persons with schizophrenia in the community that committed violence and 81 persons with schizophrenia in the community that not committed violence. In the follow-up period, 40 persons with schizophrenia in the community (31.3%) committed violence and 88 with nonviolence (68.7%) during the observation period. The TVRS exhibited good predictive validity for violence among persons with schizophrenia in the community.

Figure 6 shows this graphically with the results of the ROC analysis. The AUCs of .88 and was statistically significant ($p<.001$, 95% CI .81-.94), indicating good predictive accuracy. In general, an AUC value above .75 is considered good (Douglas, Guy, and Weir, 2005).
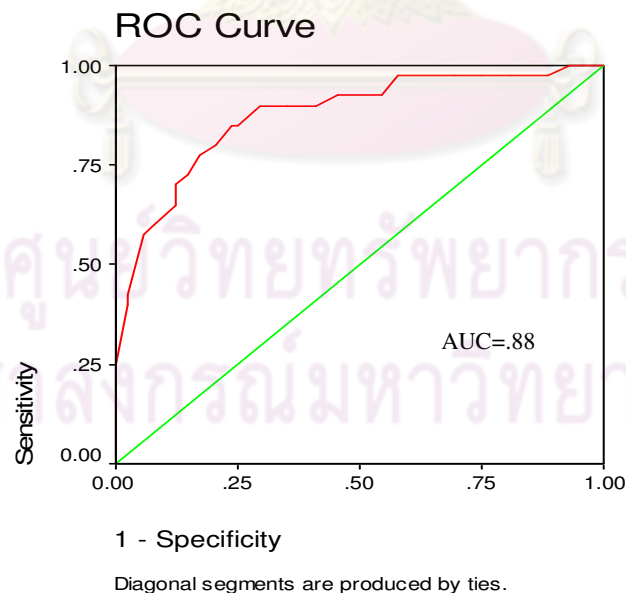
Figure 7 The ROC curve

The results of the ROC analysis, including sensitivity, specificity, positive predictive value, and the negative predictive value of the TVRS in predicting violence, with cut-off scores ranging from 18 to 24, are presented in Table 17.

Table 17 Sensitivity, specificity, the positive predictive value, and the negative predictive value of the TVRS with different cut-off scores in predicting violence

TVRS Cut-off score	Sensitivity	Specificity	Positive predictive value	Negative predictive value
24	.77	.82	.67	.89
23	.80	.79	.64	.89
22	.85	.76	.61	.91
21	.85	.76	.61	.91
18	.90	.70	.58	.93

Note: Sensitivity=true positives/(true positives+false negatives), specificity=true negatives/(true negatives+false positives), positive predictive value=true positives/(true positives+false positives), and negative predictive value=true positives/(true positives+false positives)

In this study, a TVRS cut-off score of 23 was applied to level of violence risk (low violence risk=0-23 and high violence risk=24-50) with a sensitivity of .80, a specificity of .79, a positive predictive value of .64, and a negative predictive value of .89. These indicate the accuracy of the scale.

Table 18 Test result and violence outcome

		Violence outcome	
		True	*False*
Test result	*True*	32 (true positives)	18 (false positives)
	False	8 (false negatives)	70 (true negatives)

$$\text{Sensitivity} = \frac{\text{Number of true positives}}{\text{Number of true positives} + \text{Number of false negatives}}$$

$$= 32/(32+8) = .80$$

$$\text{Specificity} = \frac{\text{Number of true negatives}}{\text{Number of true negatives} + \text{Number of false positives}}$$

$$= 70/(70+18) = .79$$

$$\text{Positive predictive value} = \frac{\text{Number of true positives}}{\text{Number of true positives} + \text{Number of false positives}}$$

$$= 32/(32+18) = .64$$

$$\text{Negative predictive value} = \frac{\text{Number of true negatives}}{\text{Number of true negatives} + \text{Number of false negatives}}$$

$$= 70/(70+8) = .89$$

5. Reliability

The Cronbach's alpha coefficient of internal consistency for the TVRS was high ($\alpha = .89$). Thus, the alpha coefficient of the TVRS was more than acceptable at 0.7 for a newly-developed instrument (Nunnally and Bernstein, 1994). Considering the internal consistency of overall scale, it was found that the alpha coefficient of the TVRS had sufficient evidence for internal consistency as a reliable scale.

Results of developing scoring and interpretation of the test score

In this study, the cutoff score of the total TVRS score of 50 was classified into two levels (low violence risk and high violence risk) based on cut-off score of 23

of the scale from the results of the ROC analysis. Thus, low violence risk was score from 0 to 23. This indicated that the persons with schizophrenia in the community that had scores from 0 to 23 were at low risk of committing violence. Moreover, the high violence risk score ranged from 24 to 50. This indicated that the persons with schizophrenia in the community that had scores from 24 to 50 were at high risk of committing violence.

In summary, the study results showed much empirical evidence to support the notion that the TVRS, which was composed of 17 items, could be accepted as a valid and reliable instrument. The factor structure of the TVRS measurement model was confirmed having 2 factors.

CHAPTER V

DISCUSSION AND CONCLUSION

The content of this chapter is divided into four parts. First, the research findings are discussed based on the objectives of the study. Secondly, the conclusion of the study is drawn based on the findings. Thirdly, the implications of the study results regarding mental health nursing practice and mental health nursing research are presented. Lastly, recommendations for future research and the limitations of the study are depicted.

Discussion

This study was of an instrument development design. The research issues for the discussion are composed of 1) the sociodemographic features of the samples, 2) the Thai Violence Risk Scale, and 3) the psychometric properties of the Thai Violence Risk Scale.

1. Sociodemographic features of the samples

The samples of this study are divided into two groups: the samples for the item analysis and EFA and the samples for the CFA, predictive validity, and reliability analysis. In the item analysis and the EFA, the samples are persons with schizophrenia that had committed violence (n=300). In the CFA, predictive validity, and reliability analysis, the samples (n=604) were different from the item analysis and

EFA. In this study, the important issue regarding the samples for the CFA, predictive validity, and reliability is that they should be sufficient for generalization findings on the target population and sufficient for reducing sampling error because the number of samples met the ratio of samples per item, which would be 10:1 (Dixon, 2001; Naunnally and Bernstein, 1994; Comrey and Lee cited in Pett et al., 2003).

However, the sociodemographic features of the samples for the item analysis and EFA, and the samples for CFA, predictive validity, and reliability analysis were similar to the findings from that reported in the literature. It was observed that the persons with schizophrenia that were associated with increased violence were of a younger age (40 years or under; Abu-Akel and Abushua'leh, 2004; Abushua'leh, and Abu-Akel, 2006; Beck et al., 2000; Swanson et al., 2006; Walsh et al., 2004), were male (Ran et al., 2010; Soyka et al., 2007; Vevera et al., 2005; Wallace et al., 1998; Yesavage, and Zarcone, 1998), Buddhism (Natthawut Arin, 2004; Prapart Ukgaranan and Veeradet Veerapongseat, 1998; Ranee Chayintu, and Nongluck Sattra, 2000), single (Bobes et al., 2009; Erkiran et al., 2006; Fresan et al., 2005), had a poor education (Cannon et al., 2002; Joyal et al., 2004), were unemployed (Erkiran et al., 2006; Natthawut Arin, 2004; Vevera et al., 2005), had a low income (Natthawut Arin, 2004; Prapart Ukgaranan and Veeradet Veerapongseat, 1998; Ranee Chayintu, and Nongluck Sattra, 2000), were young when they experienced their first psychiatric illness (Bobes et al., 2009; Fresan et al., 2005; Walsh et al., 2004), experienced previous inpatient hospitalizations (Fresan et al., 2005; Swanson et al., 2006), had a greater number of previous inpatient hospitalizations (Fresan et al., 2005; Swanson et al., 2006), when at a young age when first of admitted to a psychiatric hospital (Fresan et al., 2005), had a history of

violence (Erkiran et al., 2006; Laajasalo, and Hakkkanen, 2006; Ran et al., 2010; Swanson et al., 2006; Walsh et al., 2004), had a history of violence more than once (Laajasalo, and Hakkkanen, 2006; Tengstrom, and Hodgins, 2002; Tengstrom et al., 2001), had a greater number of previous medication noncompliance (Bobes et al., 2009; Soyka et al., 2007; Torrey, 2006; Walsh et al., 2004), had a history of substance use (Vevera et al., 2005; Walsh et al., 2004), and abuse substances (Abushua'leh, and Abu-Akel, 2006; Erkiran et al., 2006; Fresan et al., 2005; Joyal et al., 2004; Swanson et al., 2006; Walsh et al., 2004).

Considering the heterogeneity of the samples, in addition, the researcher collected data from various settings in four regions of Thailand. Therefore, the sociodemographic features of the samples represented the variety of schizophrenia types, socioeconomic status, and demographic characteristics. The variety of sociodemographic features of the samples for the CFA, predictive validity, and reliability analysis implied that the TVRS could be used in persons with schizophrenia living in both rural and urban areas, and could be used with various schizophrenia types such as paranoid schizophrenia, undifferentiated schizophrenia, residual schizophrenia, and simple schizophrenia as well.

2. The Thai Violence Risk Scale (TVRS)

The TVRS was developed in response to the need in mental health nursing to develop a more formal and uniform process to identify persons with schizophrenia in the community at high risk of committing violence. The goal of the TVRS was to develop a reliable and valid measure of the risk of violence that was

relatively brief and that could be scored by mental health nurses using only face-to-face interviews for all violent schizophrenic patients in the community.

The TVRS appears to meet these criteria. The 17-item TVRS is relatively brief and it requires only a face-to-face interview among these persons. In addition, it can be reliably scored with 10 minutes of training.

The first and second drafts of the TVRS had several properties that may make it appropriate for the testing of psychometric properties and attractive to mental health nurses and researchers.

All of the items of the TVRS were developed based on the literature review and used the Psychology of Criminal Conduct (PCC) guide to select the significant characteristics and circumstances that represented the variables associated with violence among persons with schizophrenia in the community. As a result, the TVRS reflects the characteristics and circumstances of persons with schizophrenia in the community which represent a risk of committing violence by these individuals.

Moreover, most existing definitions of the risk of violence incorporate estimates of the chance that violence will occur. These estimates are determined by considering the characteristics and circumstances which are variables identified through research as being associated with violence. Comparing the components of the TVRS and the existing instruments used to measure the violence risk concept in various populations. It was found that almost all existing violence risk scales focus on the long-term prediction of general criminality (Andrews and Bonta, 1995; Copas and Marshall, 1998; Grann et al., 2005; McNiel et al., 1988; Menzies et al., 1994; Miller, 2006; Quinsey et al., 1998; Webster et al., 1997; Wong and Gordon, 2006). Moreover, the components of these scales emphasize static and dynamic risk factors for criminal

behavior. According to the violence risk scale (VRS), was developed by Wong and Gondon in 2000 (Wong and Gordon, 2006) based on the PCC theory and literature review. The component of the VRS composed of antisocial attitudes, antisocial associates, antisocial behavioral history, antisocial personality, and problematic conditions in the domains of home, school, work, and leisure. So, these existing instruments were lack of the components involving the characteristics and circumstances surrounding violence among persons with schizophrenia in the community. Therefore, the items of these scales might have limitations particularly regarding the context of Thai persons with schizophrenia in the community.

According to the definition of the violence risk, the TVRS is a scale used to assess violence risk through the two components: characteristics and circumstances. From the literature review, the characteristics and circumstances were identified through research as being associated with violence among persons with schizophrenia in the community. In this study, the existing characteristics and circumstances for violence among persons with schizophrenia in the community were ascertained by researching both Western and Thai databases published between 1990 and 2010. Thus, the characteristics comprised being of a young age, male, have an antisocial personality disorder, education failure, living alone, being young when first hospitalized with schizophrenia, having a history of substance use, limited or no vocational activity, having a history of violence, a history of abuse, exhibiting aggressive behavior, delusions, hallucinations, excitement, being suspicious, hostile, showing lack of insight, symptoms of mania, depressive symptoms, threat/control override symptoms, being uncooperative, having disorientation, being noncompliant with medication, homeless, and having weapon availability, circumstances comprised

of poor peer relationships, poor family relationships, and excessively expressed emotions in family, as described in chapter II.

In identifying a format for the tool, the TVRS was designed as a face-to-face interview instrument. Each item was differently scored on a three-point scale (yes=1, 2, or 3 and no=0). The scale could be easily used, easily answered, and completed in 10 minutes or less in order to identify individuals that have a risk of committing violence and ruling out individuals that do not project such a risk. Therefore, the burden placed on the patient is very low for any one item and with this the scale the patients are willing to complete more binary items than other scales using a format demanding concentration on finer distinctions (DeVellis, 2003). This scale, thus, appropriately use in persons with schizophrenia who not only exhibit a degree of impulsivity but also high irritability and responsibility. According to the violence risk scale (VRS), was developed by Wong and Gondon in 2000 (Wong and Gordon, 2006) based on the PCC theory and literature review. The VRS variables are rated on 4-point Likert-type scale (0, 1, 2, or 3) that used a format demanding concentration. Moreover, it takes time for use as a screener. That is, it involves time-consuming procedures on a careful file review and a semi-structured interview. Therefore, the VRS have limitations particularly regarding the context of Thai persons with schizophrenia in the community.

In generating the item pool, a 29-item pool in the first draft of the TVRS was generated from reviewing the literature based on operational definitions of the violence risk. Each item was constructed by writing a short declarative statement reflecting the characteristics and circumstances for violence among Thai persons with schizophrenia in the community. According to DeVellis (2003), the content of each

item should primarily reflect the construct of interest and a good item should be unambiguous.

In conducting the content validity analysis, content validity concerned with whether or not the test items adequately sampled the content area, or the representatives and comprehensiveness of the items. DeVellis (2003) has stated that content validity concerns item sampling adequacy; that is, the extent to which a specific set of items reflects a content domain. The experts are asked to evaluate individual items on the new scale as well as the overall instrument. Two key issues in such an evaluation are whether individual items are relevant and appropriate in terms of the construct, and whether the items adequately measure all dimensions of the construct (Polit and Beck, 2008), as examined by a panel expert.

In this study, the 29 items of the pool that were used in the first draft of the TVRS were revised, reshaped, or deleted following the comments and suggestions of the nine experts that had experience in the area of mental health and violence among persons with schizophrenia. According to DeVellis (2003), asking for feedback in relation to accuracy, appropriateness, relevance to test specification, wording, vocabulary, sentence structure, and the readability of each item—all of these are recommended. Then, the 29 items of the first draft of the TVRS were reduced to 27 that indicated good content validity (I-CVI=.78-1.0 and S-CVI/Ave score=.86). In the content analysis, items with a I-CVI score should be .78 or higher (Lynn, 1986; Polit and Beck, 2008; McIntire and Miller, 2007) and a S-CVI/Ave score of .80 or better indicates good content validity (Davis, 1992; Polit and Beck, 2004; Waltz et al., 1991). So, the other two items were deleted because I-CVI score=.56 that indicated poor content validity.

In weighting the score, the score of each item on the second draft of the TVRS was weighted by nine other mental health experts that had had experience with violent schizophrenic patients. After the nine experts weighted the score on each of the 27 items, 3 items = 1 score, 6 items = 2 scores, and 18 items = 3 scores. According to Prentky and Righthand (2003), risk assessment scale may work better when items are properly weighted. Item weighting takes into consideration the fact that some items simply are more important than others when it comes to predicting outcome. This means that some risk factors may be more important to the construct underlying the scale than others and should therefore contribute more to the overall risk score (Bowling, 1991 cited in Papanikolaou, Lyne, and Anthony, 2007). Thus, differential valuing should be applied to dissimilar characteristics and circumstances for violence based on their empirically demonstrated importance. Failure to use this mechanism means that the non-weighted total risk score may diverge from the true, yet unknown, value, possibly affecting the clinical effectiveness of the planned nursing interventions and distorting the allocation of resources.

An item analysis is the process of evaluating the performance of each item on a test (McIntire, and Miller, 2007). This method was conducted for selecting the best item for the final draft of the TVRS. Based on the findings from the item analysis, 17 items were retained and 10 items were deleted. According to Hair and others (1998), two statistical indicators, representing normal distribution, are skewness and kurtosis. In this study, 21 items obtained skewness values falling inside the range of -1 to +1, which represented normal distribution (Hair et al., 1998); 19 items had negatively high skewness, ranging from -.19 to -1.48.

Moreover, the results of the item analysis showed that 16 of all 27 items had item-total correlations greater than .3. The other nine items were deleted because item-total correlation of these items was less than .30. For the correlation matrix, when considered, there were 7 paired-items which had an inter-item correlation ≥ .7. The item-total correlation, namely, the strength and direction of the relation between the way test takers responded to one item and the way in which they responded to all of the items as a whole (McIntire, and Miller, 2007). Item-total correlation was proposed in terms of the precision of the item, indicating how strongly an individual item reflected the total scale. Psychometrically strong items would have moderate to high correlations with the scale total and individual items. This study calculated the item-total correlation by using the Pearson product-moment correlation. Regarding a common rule of thumb, the item-total correlation should be between 0.30 and .70. Those less than .30 do not contribute much to the measurement of the concept, while those greater than .70 are probably redundant (Polit and Hungler, 1999). Therefore, the items of the TVRS with a item-total correlation less than .30 were deleted, and the paired items with an item-item correlation greater than .70 were considered keeping. However, in this study, only one item had item-total correlations less than .3 was contained because this item retained the full meaning of violence risk in this study. According to Nunnally and Bernstein (1994), they stated that although the statistical data was very useful for item selection, the final decision to include or reject any items in the final scale was primarily based on human judgment regarding what the item analysis revealed.

This evidence showed that the scale was sensitive to Thai persons with schizophrenia in the community that had committed violence, a sensitivity that does

not exist in other violence risk scales based on western culture. When considering the item statements, the TVRS was more practical for persons with schizophrenia in the community measure. The scale provides item statements which reflect specific questions on actual characteristics and circumstances for violence emerging from the persons with schizophrenia in previously and daily life that easily recall and answer.

Additionally, the Cronbach's alpha coefficient of the second draft scale was high (α = .92), indicating good reliability. According to Nunnally and Bernstein (1994), and Burn and Grove (2005), the alpha of a newly-developed scale of at least .70 is considered satisfactory. Moreover, Pedhazur and Schmelkin (1991) have stated that reliability is based on the notion that the items of the instrument measure the same phenomena, or it means that the items are homogeneous. This means that the higher the correlations among items, the higher are the individual item reliabilities (DeVellis, 2003). In this study, a high alpha might have come from the process of the 29-item generation, which strongly literature reviewed. These high scores indicated good internal consistency among the TVRS items and that it was suitable for further evaluation.

Regarding the exploratory factor analysis (EFA), from the literature review, the TVRS was hypothesized to have 2 factors: a 2-factor solution using varimax rotation was originally specified. The result showed that the two factors include factor I, characteristics (15 items), and factor II, circumstances (2 items).

Regarding the characteristics, the first factor contained 15 items, with a factor loading of .413 to .831. All of the items in this factor included personality or features or attributes, background, social status, and the conditions of Thai persons with schizophrenia in the community. Regarding the circumstances, the second factor

contained 2 items with a factor loading of .824 to .825. All items in this factor included events or situations in the family of Thai persons with schizophrenia in the community, for example, poor family relationships (item 1) and expressed emotions in family (item 2). Both of the factors in this study are similar to those of Andrews and Bonta (2006), who stated that risk factors refer to the characteristics of people and their circumstances that are associated with an increased chance of future criminal activity.

3. Psychometric properties of the Thai Violence Risk Scale

3.1 Construct validity

The transition from a conceptual framework of a violence risk concept to operational definitions indicates the validity of the TVRS. The conceptual and operational definition relationship is the measurement assumption which can be supported by validity testing (Mishel, 1998). Based on the literature review, the components of violence risk were identified as having 2 components: characteristics and circumstances used as the factor structure for testing the construct validity of the TVRS.

Confirmatory factor analysis using the LISREL program was employed to examine the construct validity of the TVRS, which was composed of two factors. The result showed that the proposed model was accepted as a good fit model. It could be concluded that the components of the Thai schizophrenic violence risk concept that were congruent with the violence risk from the literature review were supported by the empirical data testing.

Regarding factor loadings, the regression coefficients of all 17 indicators were statistically significant (p<.05). It was noted that one indicator, male gender (item 3), related to the characteristic accounting for low factor loading (b = 0.166). Although it could be stated that this indicator could predict a very small amount of variation in the characteristic factor, this indicator retained the full meaning of violence risk. Consequently, the discussion of the circumstances (2 items) and characteristics (15 items) is as follows.

In this study, poor family relationships (item 1) are the circumstances that associated with violence risk among persons with schizophrenia in the community. Poor family relationships may affect violence in complex ways, either preventing or provoking violent behavior, depending on whether the family environment serves as a protective matrix or a stimulus for aggressive interactions. Living at home with the ostensible tangible support of family members could actually serve to elevate risk for violence if a person has a conflictual and stressful relationships with another person living there (Swanson et al., 2002). Thus, the result of this study is similar to several studies that have shown an association between poor family relationships and violent behavior in persons with schizophrenia in the community (Klassen and O'Connor, 1988a, 1988b, 1988c, 1989; Natthawut Arin, 2004; Suphanee Sangrugsa, 2003; Swanson et al., 2006).

Expressed emotions in the family (item 2) are the circumstances that associated with violence risk among persons with schizophrenia in the community. This is similar to two studies showed an association between expressed emotions in the family and violent behavior in persons with schizophrenia in the community (Ranee Chayintu and Nongluck Sattra, 2000; Suphanee Sangruksa,

2003). According to Vaughn and Leff (1976), the three attitudes pertaining to negative EE are hostility, criticism, and emotional over-involvement. The hostile attitudes of EE are negative toward the person with the disorder—the family members put blame on this person because of the disorder (Brewin et al., 1991). The critical attitudes of EE are a combination of hostile and emotional over-involvement, and the critical EE from family members is the cause of future and increasing problems for the patient (Bullock, Bank, and Buraston, 2002), especially regarding violent behavior. So, when persons with schizophrenia in the community expressed emotions in the family, they might express anger or resentment. Then, they might commit violence.

Male gender (item 3) is the characteristic that associated with violence risk among persons with schizophrenia in the community. Males show higher rates of violent behaviors than females in the general population. Among people with mental disorders, violent acts by men were more likely to result in an arrest or need for medical treatment. (MacArthur Foundation, 2001) whereas violence by women was more likely than violence by men to be directed against family members and to occur at home and less likely to result in medical treatment or arrest (Harris and Lurigio, 2007). According to Monahan and Stueve (2000) and Link and others (1998), males are deemed to be more likely to be violent than females. Thus, the result of this study is similar to several researches on persons with schizophrenia that found men to be more likely than women to engage in violence (Natthawut Arin, 2004; Prapat Ukranan and Veeradech Veerapongset, 1998; Ran et al., 2010; Ranee Chayintu and Nongluck Sattra, 2000; Vevera et al., 2005; Walsh et al., 2002). However, some studies found that both men and women have similar rates of

violence. For example, research examining the relationship of gender and violence committed by psychiatric inpatients also concluded that both men and women have similar rates of aggression in this setting. In their study of 155 male and 67 female psychiatric inpatients, Krakowski and Czobor (2004) found that a similar percentage of women and men had an incident of physical assault in the hospital. However, women had a higher frequency of physical assaults during the first 10 days of the study period and men were more likely to perpetrate assaults that resulted in an injury.

Antisocial personality disorder (item4) is also the characteristic that associated with violence risk among persons with schizophrenia in the community. ASPD is comprised of persistent violations of social norms (Nolan et al., 1999) or a pervasive pattern of disregard for and violation of the rights of others that begins in childhood or early adolescence and continues into adulthood (Marmar, 2000). With respect to violence, persons with schizophrenia in the community that meet some of the criteria of ASPD may be associated with increased violence. Thus, the result of this study is similar to several studies that have shown that ASPD is an important characteristic in determining violence in person with schizophrenia (Angermeyer, 2000; Eriksson, 2008; Fullam, and Dolan, 2006; Hodgins, Hiscoke, and Freese, 2003; Hodgins, Lapalme, and Toupin, 1999).

Additionally, history of substance use (item 5) is the characteristic that associated with violence risk among persons with schizophrenia in the community. A history of excessive alcohol drinking and drug use of persons with schizophrenia, for example, was another key characteristic positively correlated with the violence. Thus, the result of this study is similar to several researches of persons with schizophrenia which found a history of violence to be associated with an

increased chance of future violence (Appelbaum et al., 2000; Erkiran et al., 2006; Monahan et al., 2000; Natthawut Arin, 2004; Prapat Ukranan and Veeradech Veerapongset, 1998; Tengstrom et al., 2000).

Having a history of violence during 6 months (item 6) is also the characteristic that associated with violence risk among persons with schizophrenia in the community. According to Monahan and others (2000), persons that commit violence are likely to commit further violence. Thus, the result of this study is similar to several studies showing that a history of violence of persons with schizophrenia in the community is associated with an increased chance of future violence (Bin and Bei, 1995; Bobes, Fillat, and Arango, 2009; Brekke et al., 2001; Natthawut Arin, 2004; Ran et al., 2010; Swanson et al., 2006).

Weapon availability (item 7) is the characteristic that associated with violence risk among persons with schizophrenia in the community. Silver (2001) has stated that if the environment into which a person is discharged offers access to weapons, the risk of violent behavior is significantly increased. Thus, the result of this study is congruent with the results of the studies of Large and others (2009) and Natthawut Arin (2004) who found that weapon availability is associated with increased violence.

Aggressive behavior (item 8) is the characteristic that associated with violence risk among persons with schizophrenia in the community. Many studies have analyzed the aggressive behaviors of persons with schizophrenia before hospitalization, and it has been shown that nearly 20% of first contact inpatients with schizophrenia behaved in an aggressive manner, and that nearly 50% of hospitalizations were due to violence occurring immediately before admission

(Humphreys et al., 1992; Volavka et al., 1997). Thus, aggressive behavior can increase violence among persons with schizophrenia in the community; the same is true in various studies (Bobes et al., 2009; Fresan et al., 2005; Fullam, and Dolan, 2006).

Having delusions (item 9) is the characteristic that associated with violence risk among persons with schizophrenia in the community. In persons with schizophrenia, acts of violence have been associated with delusional thought (Cheung et al., 1997; Fresan et al., 2005; Koen et al., 2004; Laajasalo and Hakkanen, 2006; Swanson et al., 2006). Buchanan and others (1993) found for example that persons with delusions reported that they were most likely to act on their delusions when frightened, sad, or anxious because of their beliefs. Thus, violent schizophrenic patients had a significantly higher frequency of delusions of persecution than patients categorized as "non-violent," supporting the premise that it is the nature of the delusional beliefs, rather than simply the presence of delusional beliefs, that may influence rates of violence (Cheung et al., 1997; Harris and Lurigio, 2007; Paterson et al., 2004). Thus, the result of this study is congruent with the results of several studies that have shown that delusions can be associated with an increased chance of future violence (Buchanan et al., 1993; Cheung et al., 1997; Laajasalo and Hakkanen, 2006; Swanson et al., 2006; Wessely et al., 1993).

Hallucination (item 10) is the characteristic that associated with violence risk among persons with schizophrenia in the community. Goldman and Foreman (2000) defined a hallucination as a false sensory perception of something that is not there. The relationship between violence and hallucinations has been studied virtually exclusively in relation to command hallucinations (Junginger, 1990;

Laajasalo and Hakkanen, 2006). So, when persons with schizophrenia commit violence, they may have the hallucinations at the time of the violence. Thus, the result of this study is congruent with the results of several studies that have shown that hallucinations are associated with increased chance of future violence (Laajasalo and Hakkanen, 2006; Swanson et al., 2006; Volavka et al., 1997).

Excitement (item 11) is the characteristic that associated with violence risk among persons with schizophrenia in the community. Stahl (2010) stated that excitement consists of expressing feelings without restraint, manifesting speech that is hurried, exhibiting an elevated mood, showing an attitude of superiority, dramatizing oneself or one's symptoms, manifesting loud and boisterous speech, exhibiting overactivity or restlessness, and exhibiting excess of speech. This symptom is characterized as "hyperactivity as reflected in accelerated motor behavior, heightened responsivity to stimuli, hypervigilance, or excessive mood liability." So, when persons with schizophrenia in the community are excited, they might commit violence. Thus, the result of this study is congruent with several studies that have shown that excitement is associated with increased chance of future violence (Fresan et al., 2005; Fullam, and Dolan, 2008; Volavka et al., 1997; Swanson et al., 2006).

Being suspicious (item 12) is the characteristic that associated with violence risk among persons with schizophrenia in the community. This symptom is characterized by "unrealistic or exaggerated ideas of persecution, as reflected in guardedness, a distrustful attitude, or suspicious hypervigilance that others mean one harm." So, when persons with schizophrenia in the community are suspicious, then, they might be afraid of everyone, everything, and every interaction around them (Schwecke, 2007). Then they might commit violence. Thus, the result of

this study is similar to several studies have shown that being suspicious is associated with an increased chance of future violence (Krakowski, Czobor, and Chou, 1999; Moran and Hodgins, 2004; Nolan et al., 1999; Swanson et al., 2006; Tengstrom et al., 2004).

Hostility (item 13) is the characteristic that associated with violence risk among persons with schizophrenia in the community. Hostility refers to "an emotional state characterized by enmity toward others and a desire to harm those at whom the antagonism is directed" (Mosby's Medical Dictionary, 2009). This symptom is associated with an increased chance of future violence. So, when persons with schizophrenia in the community are hostile, they might express anger or resentment and might then commit violence. Thus, the result of this study is similar to several studies have shown that being suspicious is associated with increased chances of future violence (Abu-Akel and Abushua'leh, 2004; Fullam, and Dolan, 2006; Soyka et al., 2007; Swanson et al., 2006).

Lack of insight (item 14) is also the characteristic that associated with violence risk among persons with schizophrenia in the community. Psychotic patients with poor awareness of having a mental illness also show poor compliance with both pharmacological (Kemp, and David, 1995) and psychosocial treatments (Lysaker et al., 1994). So, when persons with schizophrenia in the community lack of insight, they may discontinue medication and other treatments resulting the symptoms poor or severe. They, then, might commit violence. Thus, the result of this study is similar to several studies have shown an association between lack of insight and violent behavior in persons with schizophrenia (Arango et al., 1999; Buckley et al., 2006).

Symptoms of mania (item 15) are the characteristic that associated with violence risk among persons with schizophrenia in the community. Mania is an abnormally-elated mental state, typically characterized by feelings of euphoria, lack of inhibitions, racing thoughts, diminished need for sleep, talkativeness, risk taking, and irritability (Medical Dictionary, 2010). So, when persons with schizophrenia in the community show symptoms of mania, they feel euphoria, lack inhibitions, experience racing thoughts, a diminished need for sleep, talkativeness, risk taking, and irritability. Then, they might commit violence. Thus, the result of this study is congruent with Hodgins and others (1999) and Suphanee Sangrugsa (2003), they found an association between symptoms of mania and violent behavior in persons with schizophrenia.

Medication noncompliance (item 16) is the characteristic that associated with violence risk among persons with schizophrenia in the community. Medication noncompliance has been defined as discontinuing medication without the recommendation of the treating physician (Ghaziuddin et al., 1999). So, when persons with schizophrenia in the community are medication noncompliant, the symptoms may be poor or severe and they then might commit violence. Thus, the result of this study is similar to several studies have shown that medication noncompliance was a strong predictor of future violence (Bartels et al., 1991; Brekke et al., 2001; Monahan et al., 2001; Prapat Ukranan and Veeradech Veerapongset, 1998; Schwartz et al., 1998).

Substance abuse (item 17) is the last characteristic that associated with violence risk among persons with schizophrenia in the community. Substance abuse may influence violent behavior through the disinhibition of

behavioral controls or by directly initiating thoughts that lead to antisocial behavior. Violence may occur through the frustration experienced when a person's attempt to obtain or use substances is thwarted. Quelling the craving and desire associated with using various substances is a strong motivator, and hence a person may be more likely to act aggressively when they are prevented from acquiring substances (Douglas and Skeem, 2005). Regarding persons with schizophrenia, the result of this study is similar to several studies have shown the strength of the correlation between substance abuse and violence (Large, Smith, and Nielssen, 2009; Monahan et al., 2001; Mullen et al., 2000; Soyka, 2000; Steele et al., 2003; Wallace et al., 2004; Weiss et al., 2006).

In summary, the results of the confirmatory factor analysis provide empirical evidence to support the proposed construct of Thai schizophrenic violence risk in that this concept is comprised of 2 factors with 17 items. In addition, the factor structure of the TVRS was confirmed to be a valid measurement.

3.2 Predictive validity

In evaluating predictive validity, the predictive efficacy of the TVRS was assessed using receiver operating characteristics (ROC) which have been used frequently in the literature as measures of predictive efficacy of violence risk assessment tools. The results of the ROC take the form of a graph with the sensitivity of the predictor plotted as a function of the false rate. The area under the curve (AUC) of the ROC graph can be taken as an index for interpreting the overall accuracy of the predictor. Areas can range from 0 (perfect negative prediction), to .50 (chance

prediction), to 1.0 (perfect positive prediction) (Andrews and Bonta, 2006). Applying the ROC methodology to the TVRS data revealed that the area under the curve (AUC) was .88 (p<.001), which showed good predictive accuracy. Douglas and others (2005) have stated that the AUC values of .70 and above are considered moderate, and above .75 good. So, the TVRS has shown strong predictive accuracy for violence risk in persons with schizophrenia in the community. This might come from the fact that the development of the TVRS differed significantly from the development of other instruments; it is the only instrument based on empirically-determined characteristics and circumstances for violence among persons with schizophrenia in the community. Moreover, the strong predictive accuracy for violence risk of the TVRS was similar to the violence risk scale (VRS) that developed by Wong and Gondon in 2000 (Wong and Gordon, 2006) based on the PCC theory and literature review. The VRS predictive validity was assessed using ROC analysis. The AUCs of the ROC for the VRS total scores and dynamic scores were computed for all offenders with follow-up periods of 1.0, 2.0, 3.0 and 4.4 years for violent and nonviolent reconvictions. All AUCs were between .71 and .75 and were statistically significant (p<.001). Moreover, the result of this study was similar to other the risk assessment instrument was developed with different aims: the HCR-20 was for clinical risk assessment or research purposes (Harris et al., 1993), and was developed from review and analysis of the literature. The HCR-20 (Thai version) was translated by Wanlee Thammakosit (2007) showed the AUCs was .95 (p<.001).

With a cut-off score of 23, the TVRS demonstrated both 80% sensitivity and 79% sensitivity which showed good sensitivity and specificity for violence risk among persons with schizophrenia in the community. Dennis and others

(2006) have stated that sensitivity and specificity with the values of 80% and 70% are good and fair, respectively. This indicated that the TVRS was 80% accurate in predicting that violence will occur and 79% accurate in predicting that violence will not occur. So, the TVRS score above 23 was used to determine high violence risk among persons with schizophrenia in the community. This indicated that when assessing individuals with the TVRS, the optimal combination of sensitivity and specificity occurs when a TVRS score above 23 is used. On the other hand, the TVRS score of 23 or below is used to determine low violence risk among persons with schizophrenia in the community. This indicated that when assessing individuals with the TVRS, the optimal combination of sensitivity and specificity occurs when a TVRS score of 23 or below is used.

However, the critical issue or index are positive predictive power or negative predictive power. In this study, a positive predictive power of .64 and a negative predictive power of .89 showed moderate and good predictive power or negative predictive power, respectively. Positive predictive power is the probability that persons with schizophrenia in the community with scores above a specified cut-off will experience violence recidivism, and its inverse is the probability of false positive predictions. Negative predictive power is the probability that persons with schizophrenia in the community scoring below a specified cut-off score will not experience violence recidivism, and its inverse is the probability of false negative predictions.

3.3 Reliability

Regarding reliability, internal consistency reliability was employed. With the value of alpha coefficient, the TVRS revealed a reliable scale since Cronbach's alpha coefficient of the total scale was quite high (α = .89), which fell at an acceptable level for a newly-developed instrument, of at least .70 (Burns and Grove, 2005; Knapp and Brown, 1995; Nunnally and Bernstein, 1994). In other words, the total TVRS exhibited satisfactory internal consistency reliability. The result of this study was similar to the reliability of the violence risk scale (VRS) that developed by Wong and Gondon in 2000 (Wong and Gordon, 2006) based on the PCC theory and literature review. The Cronbach's alpha coefficient for the VRS total, dynamic item total, and static item total were .93, .94, and .69, respectively. Moreover, the result of this study was similar to the reliability of the HCR-20 (Thai version), 20 items, was translated by Wanlee Thammakosit (2007). The Cronbach's alpha coefficient for the HCR-20 total was .86.

Thus, the high Cronbach's alpha coefficient may have been influenced by the long test length (Brink and Wood, 1998; Waltz and other, 1991), where the TVRS was composed of 17 items or the scale itself was highly reliable.

Therefore, the suitability of the development procedures and psychometric property testing and satisfactory psychometric properties of the TVRS can be clinically and practically useful in assessing persons with schizophrenia in the community with a particularly high risk of committing violence. Moreover, it can help mental health nurses in identifying the characteristics and circumstances surrounding violence among persons with schizophrenia in the community. In addition, the TVRS

can help mental health nurses in preventing violence before it begins and in designing appropriate intervention strategies to reduce violence among the persons with schizophrenia in the community.

Conclusion

This study focused on the development of the TVRS among persons with schizophrenia in the community. The purposes of the study were to develop an instrument for assessing violence risk among Thai persons with schizophrenia in the community and to establish initial psychometric properties. In the part of conclusion, there are discussions on two parts; scale construction and psychometric properties testing.

1. Scale construction

Constructing the TVRS started by clarifying concept of violence risk based on the literature review. Then, operational definitions of the concept and its constructs were identified. The 29-item pool of the first draft TVRS, which reflected violence risk of persons with schizophrenia in the community, were generated based on the operational definitions that previously identified. Regarding item generation, reviewing literature was performed to collect detail of characteristics and circumstances for violence among persons with schizophrenia in the community for wording 29 item statements. Characteristics component composed of 26 items and circumstances component composed of 3 items.

The 29-item pool of the first draft TVRS was introduced to nine content experts of violence and mental health areas for conducting content validity. After validating the content, 27 items were put in the second draft TVRS. An item review (n=10), item analysis, and EFA (N=300) were conducted on examining the second draft TVRS. Finishing on scale construction phase, 17 items were selected to create the final draft TVRS which was introduced to test construct validity.

2. Psychometric properties testing

Testing psychometric properties, construct validity using confirmatory factor analysis (n=604) was conducted on the final draft TVRS. After conducting second order confirmatory factor analysis, the number of 17 items still retained in the final version of the scale, called the Thai Violence Risk Scale (TVRS). Then, testing psychometric properties on the TVRS were performed to examine internal consistency reliability (N=604). The second order factor analysis was use to test the hypothesized factor structure model specified as having 2 uncorrelated factors and 17 indicators with measurement errors. Confirming the hypothesized model, the results showed that the model was not fit to the model data. After modifying the hypothesized model, the results of overall model fit showed that all of fit measure indices of the modified model met criteria of good model fit. Additionally, factor loadings of all 17 indicators were statistically significant. Therefore, it could be conclude that all of the two factors can predict the violence risk construct significantly. Regarding internal consistency reliability, Cronbach's alpha coefficient of total scale was quite high (α = .89).

After testing psychometric properties, it could be stated that the TVRS is a newly valid and reliable research instrument that could be used to assess violence risk. The TVRS was a face to face interview with dichotomous scale (yes=2 or 3 and no=0). The scale composed of 17 items with two subscales including characteristics and circumstances. The total score of the TVRS will be obtained by summing raw scores across 17 items on two subscales and can range from 0 to 50. The higher the score, the higher the violence risk, the level of violence risk based on ROC analysis with cut-off score of 23 was classified into two levels: low violence risk (0-23) and high violence risk (24-50), respectively.

Implications and recommendations

Implications

Based on the results of this study, the usefulness of the TVRS was addressed as implications for mental health nursing research and practice.

1. Implication for mental health nursing practice

1.1 Mental health nurses can identify low violence risk or high violence risk among persons with schizophrenia in the community with two level scores on the TVRS.

1.2 Each item of the TVRS represents visible characteristics and circumstances for violence that associated with persons with schizophrenia in the community. Using the content of item statements as a matter for consideration, mental health nurses could identify characteristics and circumstances for violence that

associated with persons with schizophrenia in the community and can assist persons with schizophrenia in the community to deal with some characteristics and circumstances for violence which increased chance of future violence.

1.3 The result of the TVRS, violence risk level, well enhances the quality of care in mental health nursing for violence prevention in each violence risk level before it begins among persons with schizophrenia in the community.

2. Implication for research purpose

2.1 The results of this study show that the TVRS is a valid and reliable research instrument. Therefore, the scale can provide valid result for assessing violence risk as an outcome of research intervention which expects to be useful for mental health nursing.

2.2 The TVRS is useful for creational research study in order to find out the characteristics and circumstances which influence on violence risk of Thai persons with schizophrenia in the community.

2.3 The TVRS can also be applied for creational research study in order to find out the characteristics and circumstances which influence on violence risk of other psychiatric disorders such as schizoaffective, delusional disorders, and paranoid disorders.

Recommendation for further research

The TVRS is a very new research instrument. A lot of further studies are requested.

1. The TVRS developed in this study focused on specific persons with schizophrenia in the community only. For further study, the TVRS would be extensively tested in other psychiatric disorders such as schizoaffective, delusional disorders, and paranoid disorders.

2. To find out the persons with schizophrenia or other psychiatric disorders such as schizoaffective, delusional disorders, and paranoid disorders in the hospital who is being at violence risk.

3. A descriptive study of diagnosis type of persons with schizophrenia in relation to violence risk.

4. A prospective or longitudinal study is needed to identify how various score on the TVRS subscale may predict the outcome of violence risk. In addition, a suitable cutoff score between high, moderate, or low levels of violence risk should be studied in the same population.

Limitation

The present study is not without limitation. Limitation of this study concern about did not record diagnosis type of the samples who were Thai persons with schizophrenia in four regions of Thailand. According to this study was not record diagnosis type of Thai persons with schizophrenia; limiting interpret diagnosis type of persons with schizophrenia in relation to violence risk.

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APPENDICES

APPENDIX A

APPROVAL OF THE IRB

APPROVAL OF THE IRB

ที่ สธ ๐๘๐๘.๙/ ๔๒๖๖

สถาบันกัลยาณ์ราชนครินทร์ กรมสุขภาพจิต
๒๓ หมู่ ๘ ถนนพุทธมณฑลสาย ๔
เขตทวีวัฒนา กรุงเทพมหานคร ๑๐๑๗๐

๑๒ พฤศจิกายน ๒๕๕๓
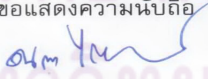
เรื่อง การดำเนินการวิจัยเพื่อเสนอเป็นดุษฎีนิพนธ์ของ นางสาวอุทยา นาคเจริญ

เรียน คณบดีคณะพยาบาลศาสตร์

อ้างถึง ๑. หนังสือคณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ที่ ศธ ๐๕๑๒.๑๑/๑๕๙๖
           ลงวันที่ ๒๓ กันยายน ๒๕๕๓
        ๒. หนังสือคณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ที่ ศธ ๐๕๑๒.๑๑/๑๕๙๗
           ลงวันที่ ๒๓ กันยายน ๒๕๕๓

           ตามหนังสือที่อ้างถึง ๑ คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ขอความ
อนุเคราะห์ให้ นางสาวอุทยา นาคเจริญ ทดลองใช้เครื่องมือและเก็บรวบรวมข้อมูลการวิจัย จากกลุ่ม
ตัวอย่างผู้ป่วยโรคจิตเภทที่มารับการรักษา ณ แผนกผู้ป่วยใน ผู้ป่วยนอก และขอเสนอโครงการวิจัยเพื่อ
ขอรับการพิจารณาจริยธรรม ตามหนังสืออ้างถึง ๒ คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย นั้น

           สถาบันกัลยาณ์ราชนครินทร์ โดยคณะกรรมการพิจารณาแล้วอนุเคราะห์ให้ น.ส.อุทยา
นาคเจริญ ทดลองใช้เครื่องมือและเก็บรวบรวมข้อมูลการวิจัย ณ แผนกผู้ป่วยในและผู้ป่วยนอก
ตั้งแต่วันที่ ๙ พฤศจิกายน ๒๕๕๓ เป็นต้นไปจนกว่าจะแล้วเสร็จ โดยมอบหมาย นางสาวเพ็ญพรรณ
ชิตวร ตำแหน่ง พยาบาลวิชาชีพชำนาญการ เป็นผู้ประสานงานการเก็บข้อมูลดังกล่าว และผ่านการ
พิจารณาจริยธรรมการวิจัยเรียบร้อยแล้ว

           จึงเรียนมาเพื่อโปรดทราบ

ขอแสดงความนับถือ

(นางดวงตา ไกรภัสสร์พงษ์)
รองผู้อำนวยการฝ่ายการแพทย์ รักษาราชการแทน
ผู้อำนวยการสถาบันกัลยาณ์ราชนครินทร์

กลุ่มพัฒนาวิชาการและจัดการความรู้
โทร. ๐ ๒๔๐๔ ๒๐๒๙, ๐ ๒๘๘๙ ๙๐๖๖ ต่อ ๑๕๓๗
โทรสาร. ๐ ๒๘๘๙ ๙๐๘๓

ที่ สธ ๐๘๑๑/๑๗๗๗

โรงพยาบาลพระศรีมหาโพธิ์
๒๑๒ ถ.แจ้งสนิท ต.ในเมือง
อ.เมือง จ.อุบลราชธานี
๓๔๐๐๐

๗๘ ธันวาคม ๒๕๕๓

เรื่อง แจ้งผลการพิจารณาด้านจริยธรรมการวิจัย

เรียน คณบดีคณะพยาบาลศาสตร์จุฬาลงกรณ์มหาวิทยาลัย

สิ่งที่ส่งมาด้วย ๑. แบบตอบแจ้งผลการพิจารณาด้านจริยธรรมการวิจัย

    ตามที่คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ขอความอนุเคราะห์ให้ นางสาวอุทยา
นาคเจริญ นิสิตขั้นปริญญาดุษฎีบัณฑิต คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย เก็บข้อมูล
วิทยานิพนธ์เรื่อง "การพัฒนาเครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภท" นั้น

    ในการนี้ คณะกรรมการจริยธรรมการวิจัยในโรงพยาบาลพระศรีมหาโพธิ์ ได้พิจารณาด้าน
จริยธรรมการวิจัยในผู้ป่วยและบุคลากรโรงพยาบาลพระศรีมหาโพธิ์แล้ว มีมติ อนุมัติให้ดำเนินการวิจัยใน
โรงพยาบาลพระศรีมหาโพธิ์ได้ โดยมีเงื่อนไขให้ปรับปรุงแก้ไขในประเด็นตามรายละเอียดที่แนบมาพร้อมนี้

    จึงเรียนมาเพื่อโปรดทราบและพิจารณาดำเนินการต่อไป

        ขอแสดงความนับถือ

        (นายธรณินทร์ กองสุข)
      ผู้อำนวยการโรงพยาบาลพระศรีมหาโพธิ์

กลุ่มงานวิจัยและพัฒนาเทคโนโลยีสุขภาพจิต
โทรศัพท์ ๐๔๕-๓๑๒๕๕๐ ต่อ ๔๑๐, ๔๑๓
โทรสาร ๐๔๕-๓๑๒๕๔๗

ที่ สธ ๐๘๑๒/ ๖๒

โรงพยาบาลสวนสราญรมย์
ตำบลท่าข้าม อำเภอพุนพิน
จังหวัดสุราษฎร์ธานี ๘๔๑๓๐

๑๐ มกราคม ๒๕๕๔

เรื่อง ผลการพิจารณาจริยธรรมการวิจัย

เรียน คณบดีคณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

อ้างถึง หนังสือที่ ศธ ๐๕๑๒.๑๑/๑๕๙๗ ลงวันที่ ๒๓ กันยายน ๒๕๕๓

สิ่งที่ส่งมาด้วย ผลการพิจารณาโครงการวิจัย จำนวน ๑ ชุด

        ตามหนังสือที่อ้างถึงคณบดีคณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย แจ้งความประสงค์
ให้ นางสาวอุทยา นาคเจริญ นิสิตขั้นปริญญาดุษฎีบัณฑิต คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ดำเนินการวิจัยเพื่อเสนอเป็นวิทยานิพนธ์เรื่อง "การพัฒนาเครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรม
รุนแรงในผู้ป่วยจิตเภท" โดยเก็บรวบรวมข้อมูลวิจัยเพื่อการวิจัยดังกล่าว ณ โรงพยาบาลสวนสราญรมย์
อำเภอพุนพิน จังหวัดสุราษฎร์ธานี

        โรงพยาบาลสวนสราญรมย์ ได้พิจารณาแล้วไม่ขัดข้องให้ นางสาวอุทยา นาคเจริญ นิสิตขั้น
ปริญญาดุษฎีบัณฑิต เก็บรวบรวมข้อมูลเพื่อการดำเนินการวิจัยเรื่องดังกล่าว ดังรายละเอียดจากการพิจารณา
จริยธรรมการวิจัยตามเอกสารที่แนบท้าย

        จึงเรียนมาเพื่อโปรดพิจารณาดำเนินการต่อไปด้วย จะเป็นพระคุณ

ขอแสดงความนับถือ

(นายพงศ์เกษม ไข่มุกด์)
ผู้อำนวยการโรงพยาบาลสวนสราญรมย์

กลุ่มการพยาบาล งานสุขภาพจิตและจิตเวชชุมชน
โทร. ๐-๗๗๓๑-๑๙๔๙
โทรสาร ๐-๗๗๒๔-๐๕๖๕ ,๐-๗๗๓๑-๑๘๔๔

ที่ สธ ๐๘๑๐.๑๐๑/ ๔๕๗๖

โรงพยาบาลสวนปรุง กรมสุขภาพจิต
๑๓๑ ถนนช่างหล่อ ตำบลหายยา
อำเภอเมือง จังหวัดเชียงใหม่ ๕๐๑๐๐

๑๑ พฤศจิกายน ๒๕๕๓

เรื่อง   การขอเสนอโครงการวิจัยเพื่อขอรับการพิจารณาจริยธรรม

เรียน   คณบดีคณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

อ้างถึง หนังสือคณะพยาบาลศาสตร์ ที่ ศธ ๐๕๑๒.๑๑/๑๕๕๗ ลงวันที่ ๒๓ กันยายน ๒๕๕๓

สิ่งที่ส่งมาด้วย เอกสารเลขที่ ๒๗/๒๕๕๓   จำนวน ๑ ฉบับ

                ตามหนังสือที่อ้างถึง คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ขอเสนอรับการพิจารณา
จริยธรรมการวิจัย ของ นางสาวอุทยา นาคเจริญ นิสิตขั้นปริญญาดุษฎีบัณฑิต เพื่อประกอบการทำวิจัยเพื่อเสนอ
เป็นวิทยานิพนธ์ เรื่อง "การพัฒนาเครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภท" นั้น

                โรงพยาบาลสวนปรุง โดยคณะกรรมการจริยธรรมการวิจัยในคนโรงพยาบาลสวนปรุง ได้พิจารณา
โครงการวิจัยแล้ว คณะกรรมการฯ พิจารณาในแง่จริยธรรมให้ดำเนินการศึกษาวิจัยดังกล่าวได้

                จึงเรียนมาเพื่อทราบ

                                        ขอแสดงความนับถือ

                                        (นางภารณี ชวาลวุฒิ)
                                ทันตแพทย์เชี่ยวชาญ รักษาการในตำแหน่ง
                                ผู้อำนวยการ โรงพยาบาลสวนปรุง

ฝ่ายบริหารทั่วไป
โทร ๐ ๕๓๒๘ ๐๒๒๘ ต่อ ๔๕๓
โทรสาร ๐ ๕๓๒๗ ๑๐๘๔
E-mail suanprung@suanprung.go.th

APPENDIX B

LIST OF THE EXPERTS

LIST OF THE EXPERTS

List of experts for CVI

Nine experts who validate content of the Thai Violence Risk scale were presented as follows:

1. Mr. Kiattibhoom Vongrachit (M.D., Psy., Psychiatrist)

   Department of Mental Health, Ministry of Publish Health

2. Professor Ronnachai Kongsakon (M.D., M.R.C., Psy., MSc., LLB., Psychiatrist) Faculty of Medicine, Ramathibodi Hospital, Mahidol University

3. Mr. Prawate Tantipiwatanaskul (M.D., Psy., Psychiatrist)

   Department of Mental Health, Ministry of Publish Health

4. Associate Professor Dr. Yajai Sitthimongkol (Ph.D., R.N.)

   Faculty of Nursing, Mahidol University

5. Associate Professor Dr. Nanthaphan Chinlumprasert (Ph.D., R.N.)

   Faculty of Nursing Science, Assumption University of Thailand.

6. Associate Professor Dr. Sucheera. Phattrayuttawat (Ph.D.)

   Faculty of Medicine, Siriraj hospital, Mahidol University

7. Ms. Benjawan Samsalee (M.N.S., R.N., Mental Health Nurse)

   Galya Rajanagarindra Institute, Department of Mental Health

8. Mrs. Jalee Jaroensan (M.N.S., R.N., Mental Health Nurse)

   Suansaranrom hospital, Department of Mental Health

9. Ms. Pavinee Tanabodee-tummajaree (M.N.S., R.N., Mental Health Nurse)

   Somdet ChaoPraya institute of psychiatry, Department of Mental Health

List of experts for weighting score

Nine experts, who weighted score on each item of the second draft of the Thai Violence Risk Scale were presented as follows:

1. Mr. Prapat Ukranan (M.D., Psy., Psychiatrist)

   Nakhorn Rachsima Rajanagarindra Psychiatric Hospital, Department of Mental Health

2. Mrs. Duangta Graipaspong (M.D., Psy., Psychiatrist)

   Galya Rajanagarindra Institute, Department of Mental Health

3. Ms. Wanatda Thomkapanich (M.D., Psy., Psychiatrist)

   Galya Rajanagarindra Institute, Department of Mental Health

4. Ms. Rachneekorn Ampong (M.D., Psy., Psychiatrist)

   Galya Rajanagarindra Institute, Department of Mental Health

5. Ms. Benjawan Samsalee (M.N.S., R.N., Mental Health Nurse)

   Galya Rajanagarindra Institute, Department of Mental Health

6. Ms. Orapan Sanor (M.Sc., R.N., Mental Health Nurse)

   Galya Rajanagarindra Institute, Department of Mental Health

7. Dr. Kotchpong Sarakan (Ph.D., M.N.S., R.N., Mental Health Nurse)

   Prasrimahabhodi Psychiatric Hospital, Department of Mental Health

8. Mr. Suruch Sunanta (M.N.S., R.N., Mental Health Nurse)

   Suan Prung Psychiatric Hospital, Department of Mental Health

9. Mr. Natthawut Arin (M.A., Psychologist)

   Galya Rajanagarindra Institute, Department of Mental Health
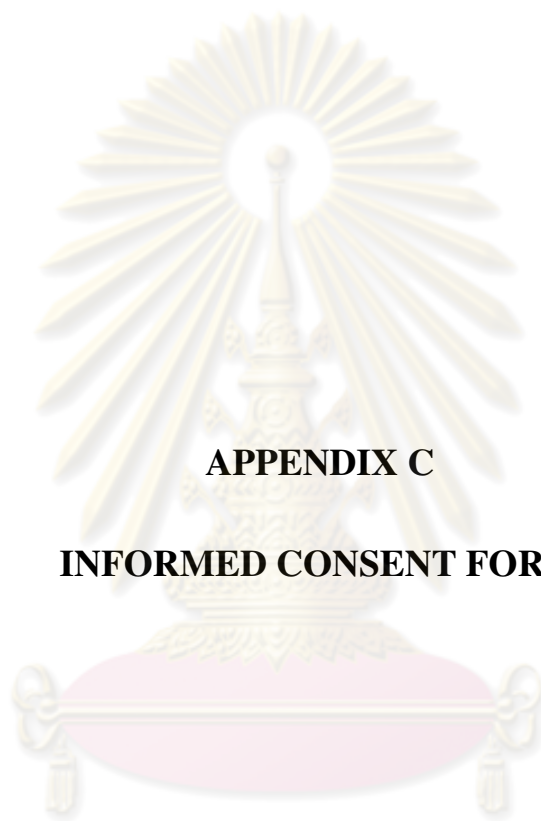
APPENDIX C

INFORMED CONSENT FORM

INFORMED CONSENT FORM

Population sample/Participant Information Sheet

Title: The Development of Thai Violence Risk Scale (TVRS) for

Persons with Schizophrenia

Researcher name: Miss Utaya Nakcharoen, Doctoral Student

Faculty of Nursing, Chulalongkorn University

Work place: 23 Moo 8 Galya Rajanagarindra Institute, Thaweewattana,

Bangkok 10170, Office phone: 02–8899066 ext. 2101, 2102

Mobile phone: 081-4421667

The objective of this research is developing the assessment of violence risk in Thai persons with schizophrenia after discharge. In this research, mental health nurses will understand in factors related to violence risk and has violence risk assessment tool for violent prevention in persons with schizophrenia after discharge. This study can help persons with schizophrenia after discharge long live with healthy in the society and re-admission rate will be decreased.

In this research, the information is gathered from Thai persons with schizophrenia after discharge who meet the bases criteria include: 1) being diagnosis of schizophrenia by ICD-10, 2) being 18 years or more, 3) being discharged from psychiatric hospital at least one month, 4) having past history of violence, 5) being able to use Thai verbal communication, 6) willing to participate in this study by answering the questionnaire about basic information and violence risk of the Thai persons with schizophrenia after discharge. The time used in answering questionnaire for each patient

not more than 10 minutes. The setting for this study is the out patient department of psychiatric hospitals of Mental Health Department, Ministry of Public Health, in four regions of Thailand. Theses included in the north region (Suan Prung Psychiatric Hospital), northeast region (Prasrimahabhodi Psychiatric Hospital), central region (Galiya Rajanagarindra Institute), and southern region (Suansaranrom Hospital). There are approximately 900 participants and estimated time to complete gathering information is 3 months.

To keep all information secret, every questionnaire will be classified by number. Therefore, your name and other information that specific to you will not appear or relate to the questionnaire that you answer. In addition, the people involved in this study and data analysis are group of researcher only, other people will not see these information.

If you have any question about participating in answering the questionnaire of this research, you can directly contact to Miss Utaya Nakcharoen, Faculty of Nursing, Chulalongkorn University, 12th Floor Wittayakit Building, Siamsquare Soi 4, Pathumwan, Bangkok 10330, Tel. 081-4421667 or contact to Associate Professor Jintana Yunibhand, Faculty of Nursing, Chulalongkorn University, Bangkok, Tel. 02-2189800.

To participate in this research, the participant willing to do and there is no danger to do that. You can refuse to answer the question or give up answering question any time if you want and there is no any effect to you. If you want to participate in answering the questionnaire, please fill in the information on page 2 and you will get a copy of this document. Your signature confirms that the person who gathers the information answer all of your questions and you willing to participate in answering the questionnaire of this research.

Consent Form for the Participants

ข้อมูลสำหรับผู้มีส่วนร่วมในการวิจัย

ชื่อโครงการวิจัย การพัฒนาเครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภท
ชื่อผู้วิจัย นางสาวอุทยา นาคเจริญ นักศึกษาปริญญาเอก คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
สถานที่ปฏิบัติงาน 23 หมู่ 8 สถาบันกัลยาณ์ราชนครินทร์ ทวีวัฒนา กรุงเทพมหานคร
　　　　　　　　โทรศัพท์: 02-8899-066 ต่อ 2101, 3020 โทรศัพท์เคลื่อนที่: 08-5126-6670

　　　　　การวิจัยครั้งนี้ มีวัตถุประสงค์เพื่อพัฒนาเครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงใน
ผู้ป่วยจิตเภท ซึ่งจะทำให้พยาบาลจิตเวชเข้าใจถึงปัจจัยต่างๆที่สัมพันธ์กับความเสี่ยงต่อการเกิดพฤติกรรมรุนแรง
ในผู้ป่วยจิตเภทที่อาศัยอยู่ในชุมชน และมีเครื่องมือในการประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงใน
ผู้ป่วยจิตเภทที่อาศัยอยู่ในชุมชน เพื่อป้องกันการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทที่อาศัยอยู่ในชุมชน อันจะ
ส่งผลให้ผู้ป่วยจิตเภทสามารถดำเนินชีวิตอยู่ในสังคมได้อย่างปกติสุข รวมทั้งลดอัตราการกลับไปรับการรักษา
แบบผู้ป่วยในซ้ำ

　　　　　ผู้มีส่วนร่วมในการวิจัยเป็นผู้ป่วยจิตเภทที่มีอายุตั้งแต่ 18 ปี ขึ้นไป อาศัยอยู่ในชุมชน สามารถสื่อสาร
โดยใช้ภาษาไทย และยินดีให้ความร่วมมือในการวิจัย การตอบแบบสอบถามแต่ละครั้งจะใช้เวลาไม่เกิน 10 นาที
โดยมีผู้ร่วมตอบแบบสอบถามทั้งหมด จำนวน 900 ราย จากแผนกผู้ป่วยนอกของโรงพยาบาลในสังกัดกรมสุขภาพจิต
ทั้ง 4 ภาค ได้แก่ สถาบันกัลยาณ์ราชนครินทร์ โรงพยาบาลสวนปรุง โรงพยาบาลพระศรีมหาโพธิ์ และ โรงพยาบาล
สวนสราญรมย์ โดยคาดว่าจะเก็บข้อมูลเสร็จสมบูรณ์ภายใน 3 เดือน

　　　　　เพื่อให้ข้อมูลต่างๆ เป็นความลับ แบบสอบถามทุกฉบับจะถูกจำแนกโดยใช้ตัวเลข ดังนั้นชื่อของคุณและ
ข้อมูลอื่นๆ ที่ชี้เฉพาะว่าเป็นตัวคุณ จะไม่ปรากฏหรือเชื่อมโยงกับแบบสอบถามที่คุณตอบ นอกจากนี้คนที่จะศึกษา
และวิเคราะห์ข้อมูลจะมีเฉพาะผู้วิจัยและอาจารย์ที่ปรึกษาเท่านั้น คนอื่นๆ ที่ไม่เกี่ยวข้องจะไม่เห็นข้อมูลต่างๆ
เหล่านี้

　　　　　ถ้าคุณมีคำถามเกี่ยวกับการให้ความร่วมมือในการตอบแบบสอบถามในงานวิจัยครั้งนี้ คุณสามารถ
ติดต่อ นางสาวอุทยา นาคเจริญ โดยตรงได้ที่ คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย อาคารวิทยกิตติ์ ชั้น 12
สยามสแควร์ ซอย 4 เขตปทุมวัน กรุงเทพฯ 10330 เบอร์โทรศัพท์ 085-1266670 หรือ ติดต่อ รองศาสตราจารย์ ดร.
จินตนา ยูนิพันธุ์ ประธานคณะกรรมการ ที่ปรึกษาปริญญานิพนธ์ คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
กรุงเทพมหานคร เบอร์โทรศัพท์ 02-2189800

　　　　　การเข้าร่วมในงานวิจัยนี้เป็นไปด้วยความสมัครใจและไม่มีอันตรายใดๆทั้งสิ้น คุณสามารถปฏิเสธการ
ตอบคำถาม หรือถอนตัวจากการตอบแบบสอบถามในเวลาใดก็ได้ โดยไม่มีผลกระทบใดๆต่อคุณ ถ้าคุณประสงค์
ที่จะให้ความร่วมมือในการตอบแบบสอบถามดังกล่าว โปรดกรอกข้อมูลต่างๆ ในหน้าที่ 2 คุณจะได้รับสำเนา
เกี่ยวกับเอกสารนี้ 1 ชุด ลายเซ็นของคุณเป็นการแสดงว่าผู้เก็บข้อมูลได้ตอบคำถามข้อสงสัยของคุณทุกข้อแล้ว
และคุณสมัครใจที่จะให้ความร่วมมือในการตอบแบบสอบถามสำหรับงานวิจัยนี้

Informed Consent Form

Title: The Development of Thai Violence Risk Scale (TVRS) for Persons
with Schizophrenia

Code number: Population or Participant……………………………………………

I was informed by Miss Utaya Nakcharoen

Address 23 Moo 8 Galya Rajanagarindra Institute, Thaweewattana,

Bangkok 10170

She has signed her name in this document and has explained the objectives
of the study, research process, benefit and harm which may occur during
investigation. I have asked all questions until I fully understand the whole research
process.

I agree to participate in this study. I may withdraw from the study without
providing a reason.

I recognize any side effects or harm that may occur during the study. If I
experience any harmful effects, I will follow the advice given to me by the researcher.
I was informed by the researcher that if, it harmful effects occur during the
investigation. I will be protected by the Law. I will report any harmful effects to
researcher as soon as possible. If not, I will not be protected by Law.

I agree to provide honest information to the researcher, so as to bring a
benefit to this study.

Finally, I agree willingly to participate in this study under the conditions above.

………………………………   ………………………………..
Place / Date   Name of subject/ participant

…………………………   ……………………………..
                                                    (……………………………..)
Place / Date   Main researcher signature

…………………………   ……………………………..
                                                    (……………………………..)
Place / Date   Witness signature

ใบยินยอมของผู้มีส่วนร่วมในการวิจัย

ชื่อโครงการ: การพัฒนาเครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภท

เลขที่: ผู้มีส่วนร่วมในการวิจัย...................................

        ข้าพเจ้าได้ทราบจากผู้วิจัยชื่อ นางสาวอุทยา นาคเจริญ นิสิตปริญญาเอก คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย สถานที่สำหรับติดต่อคือ 23 หมู่ 8 สถาบันกัลยาณ์ราชนครินทร์ ทวีวัฒนา กรุงเทพมหานคร 10170

        ข้าพเจ้าได้ลงนามด้านท้ายของหนังสือนี้ หลังจากได้รับทราบถึงวัตถุประสงค์ ลักษณะ และแนวทางการศึกษาวิจัย รวมทั้งทราบถึงผลดีหรือประโยชน์ที่จะได้รับ ข้าพเจ้าได้ซักถามทำความเข้าใจเกี่ยวกับ การศึกษาดังกล่าวเรียบร้อยแล้ว

        ข้าพเจ้ายินดีเข้าร่วมการศึกษาวิจัยครั้งนี้โดยสมัครใจ และอาจถอนตัวจากการเข้าร่วมศึกษานี้ เมื่อใดก็ได้โดยไม่จำเป็นต้องแจ้งเหตุผล รวมทั้งจะปฏิบัติตัวตามคำแนะนำของผู้วิจัย

        ข้าพเจ้าได้รับทราบจากผู้วิจัยว่า ข้าพเจ้าจะไม่ได้รับอันตรายใดๆจากการศึกษาวิจัยครั้งนี้ อย่างไรก็ตาม หากข้าพเจ้าได้รับความผิดปกติอันเนื่องมาจากการศึกษาวิจัยครั้งนี้ ข้าพเจ้าจะได้รับความคุ้มครองทางกฎหมายและจะแจ้งผู้วิจัยทันที ในกรณีที่มิได้แจ้งให้ผู้วิจัยทราบในทันทีถึงความผิดปกติที่เกิดขึ้น จะถือว่าข้าพเจ้าทำให้การคุ้มครองความปลอดภัยเป็นโมฆะ (ตามที่กฎหมายกำหนด)

        สุดท้ายนี้ ข้าพเจ้ายินดีให้ข้อมูลของข้าพเจ้ากับผู้วิจัย เพื่อเป็นประโยชน์ในการศึกษาวิจัยครั้งนี้ และยินดีเข้าร่วมการศึกษานี้ ภายใต้เงื่อนไขที่ระบุไว้แล้วในข้างต้น

....

สถานที่/วันที่   ลงนามผู้มีส่วนร่วมในการวิจัย

....

                                 (................................)

สถานที่/วันที่   ลงนามผู้วิจัยหลัก

....

สถานที่/วันที่   (................................)

                                 ลงนามพยาน

APPENDIX D

THE ITEM POOL OF THE FIRST DRAFT TVRS (29 ITEMS)

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

THE ITEM POOL OF THE FIRST DRAFT TVRS (29 ITEMS)

ข้อที่	คำถาม
	ด้านสภาพการณ์ต่างๆ
1	ในครอบครัวของคุณมีเหตุการณ์ดังต่อไปนี้เกิดขึ้น (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่)
	1.1 สมาชิกในครอบครัวไม่ดูแล สนับสนุนกันและกัน (.....) มี (.....) ไม่มี
	1.2 สมาชิกในครอบครัวมีความขัดแย้ง ไม่ลงรอยกัน (.....) มี (.....) ไม่มี
	1.3 ไม่ได้รับการเลี้ยงดูเอาใจใส่จากสมาชิกในครอบครัว (.....) มี (.....) ไม่มี
	1.4 ไม่มีผู้ใดในครอบครัวรับฟังความทุกข์ของคุณ (.....) มี (.....) ไม่มี
	1.5 อาศัยอยู่ในบ้านที่มีกฎระเบียบเคร่งครัด (.....) มี (.....) ไม่มี
2	สมาชิกในครอบครัวของคุณมีการแสดงอารมณ์ต่อไปนี้ (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่)
	2.1 มุ่งร้ายต่อกัน (.....) มี (.....) ไม่มี
	2.2 วิพากษ์วิจารณ์อย่างรุนแรงต่อกัน (.....) มี (.....) ไม่มี
	2.3 กล่าวโทษว่าความเจ็บป่วยของคุณเป็นต้นเหตุของปัญหาในครอบครัว (.....) มี (.....) ไม่มี
3	คุณมักถูกเพื่อนหรือคนอื่นๆดูถูก หยอกล้อ กลั่นแกล้ง คุกคาม หรือ รังแก
	ด้านคุณลักษณะต่างๆ
4	ปัจจุบันคุณมีอายุ...............ปี (ถ้ามีอายุ 40 ปี หรือ น้อยกว่า)
5	ตามบัตรประชาชนระบุเพศของคุณ คือ เพศชาย
6	คุณมักจะมีพฤติกรรม ความคิด หรือความรู้สึกดังต่อไปนี้ (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่)
	6.1 แสดงพฤติกรรมตอบโต้รุนแรงทันทีทันใด เมื่อสิ่งที่เกิดขึ้น ไม่เป็นไปอย่างที่ต้องการ (.....) มี (.....) ไม่มี
	6.2 กระทำการใดๆเพื่อให้ได้รับผลประโยชน์มากกว่าคนอื่นเสมอ (.....) มี (.....) ไม่มี
	6.3 รู้สึกไม่พอใจอย่างมากในทันที เมื่อสิ่งที่เกิดขึ้นไม่เป็นไปอย่างที่ต้องการ (.....) มี (.....) ไม่มี
	6.4 โกรธหรือหงุดหงิดง่าย เมื่อเจอกับเหตุการณ์ที่ไม่ชอบ (.....) มี (.....) ไม่มี
	6.5 มักจะทำงานไม่สำเร็จตามที่ได้รับมอบหมาย (.....) มี (.....) ไม่มี
	6.6 ปล่อยให้การกระทำผิดของตัวเองผ่านไป โดยไม่คิดถึงอีกเลย (.....) มี (.....) ไม่มี
7	คุณต้องลาออก หรือ เคยถูกไล่ออกจากโรงเรียนกลางคัน เนื่องจากมีปัญหาด้านการเรียน
8	ปัจจุบันคุณอาศัยอยู่ตามลำพัง
9	คุณเข้าโรงพยาบาลเพื่อรักษาโรคจิตเภทครั้งแรกตอนอายุ 30 ปี หรือ น้อยกว่า
10	คุณเคยดื่มสุราหรือใช้สารเสพติดจนเกิดเหตุการณ์ดังต่อไปนี้ (ตอบว่าเคยอย่างหนึ่งอย่างใด ก็ถือว่าใช่)
	10.1 ดื่มสุราจนมีปัญหาสุขภาพ ครอบครัว หรือ ในที่ทำงาน (.....) เคย (.....) ไม่เคย
	10.2 ใช้สารเสพติดจนเกิดปัญหากับเพื่อน ครอบครัว หรือ มีปัญหาสุขภาพ (.....) เคย (.....) ไม่เคย
11	ขณะนี้คุณไม่มีงานที่มีรายได้ตอบแทนทำ
12	ในระหว่าง 6 เดือนที่ผ่านมา คุณเคยใช้กำลังหรือใช้อาวุธ ข่มขู่ คุกคาม หรือทำร้าย ผู้อื่นจนเกิดการบาดเจ็บ หรือ เสียชีวิต
13	คุณเคยถูกทำร้ายร่างกาย
14	คุณพกพาอาวุธไว้กับตัว หรือ สามารถหยิบใช้อาวุธได้ง่าย
15	ในระยะ 3 เดือนที่ผ่านมา คุณอาศัยหลับนอนในที่สาธารณะ (ริมทางเท้า ป้ายรถประจำทาง ศาลาริมถนน ใต้ทางด่วน หรือ ที่อื่นๆ)
16	เมื่อคุณไม่พอใจหรือโกรธ คุณจะทำร้ายผู้อื่น ทำลายสิ่งของ หรือ ทำร้ายตนเอง

ข้อที่	คำถาม
	ในระหว่าง 1 สัปดาห์ที่ผ่านมา คุณมีพฤติกรรม อาการ การรับรู้ ความคิด หรือความรู้สึกดังต่อไปนี้
17	วันนี้ วันที่........เดือน........ ปี พ.ศ............ ที่นี่เรียกว่า..................................... (ชี้ไปที่บุคคลที่คุ้นเคย) บุคคลผู้นี้คือ........................... (หากผู้ป่วยตอบไม่ได้หรือไม่ถูกข้อใดข้อหนึ่ง ก็ถือว่าใช่)
18	18.1 คุณคิดว่าคุณกำลังถูกปองร้าย หรือ ถูกกลั่นแกล้ง　　　　　　　　(.....) มี　(.....) ไม่มี 18.2 คุณคิดว่าคุณมีความสามารถพิเศษ เป็นใหญ่เป็นโต หรือ มีอำนาจมาก　　(.....) มี　(.....) ไม่มี 18.3 คุณคิดว่าความคิดหรือการกระทำของคุณถูกควบคุมด้วยอิทธิพลหรืออำนาจบางอย่าง (.....) มี　(.....) ไม่มี 18.4 คุณคิดว่าคนอื่นกำลังพูดถึงหรือนินทาว่าร้ายคุณ　　　　　　　　(.....) มี　(.....) ไม่มี 18.5 คุณคิดว่าคู่ครองหรือแฟนของคุณ ไปมีความสัมพันธ์กับคนอื่น　　　(.....) มี　(.....) ไม่มี (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่)
19	19.1 คุณได้ยินเสียงบอกให้ทำร้ายคนอื่น ในขณะที่คนอื่น ไม่ได้ยิน　　　(.....) มี　(.....) ไม่มี 19.2 คุณได้ยินเสียงคนพูด เสียงหวีดร้องหรือเสียงอื้ออึง ในขณะที่คนอื่น ไม่ได้ยิน　(.....) มี　(.....) ไม่มี 19.3 คุณมองเห็นผี สัตว์ดุร้าย หรือ คน จะมาทำร้ายในขณะที่คนอื่น ไม่เห็น　(.....) มี　(.....) ไม่มี (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่)
20	คุณรู้สึกตื่นเต้น กระวนกระวาย อยู่นิ่งไม่ได้
21	คุณรู้สึกว่าคนรอบข้างไว้ใจไม่ได้ คอยหาโอกาสทำร้ายหรือกลั่นแกล้งคุณอยู่
22	คุณรู้สึกโกรธ หรือ ขุ่นเคืองคนรอบข้าง และต้องการทำร้ายคนเหล่านั้น
23	คุณรู้สึกว่าคุณสบายดีไม่ได้เจ็บป่วยใดๆ
24	คุณรู้สึกร้อนรน รำคาญใจ ต้องเดินไปเดินมา พูดมาก หรือ ไม่นอน
25	คุณรู้สึกเศร้า ไร้ค่า หดหู่ สิ้นหวัง ไม่มีแรงทำกิจกรรมใดๆ และบางครั้งมีความคิดไม่อยากมีชีวิตอยู่หรือพยายามทำร้ายตัวเอง
26	คุณคิดว่ามีผู้อื่นคอยกำกับควบคุม คุกคามหรือนำความคิดเข้ามาใส่ในสมองของคุณ
27	คุณไม่ชอบทำตามคำสั่งหรือคำขอร้องของผู้อื่น
28	คุณรับประทานยาจิตเวช ไม่ต่อเนื่อง บางครั้งลืมและหยุดรับประทานยาเมื่ออาการทางจิตดีขึ้น หรือ มีผลข้างเคียง
29	ปัจจุบันคุณดื่มสุราหรือใช้สารเสพติดจนเกิดเหตุการณ์ดังต่อไปนี้ (ตอบว่าเคยอย่างหนึ่งอย่างใด ก็ถือว่าใช่) 29.1 ดื่มสุราจนมีปัญหาสุขภาพ ครอบครัว หรือ ในที่ทำงาน　　　　　(.....) มี　(.....) ไม่มี 29.2 ใช้สารเสพติดจนเกิดปัญหากับเพื่อน ครอบครัว หรือ มีปัญหาสุขภาพ　(.....) มี　(.....) ไม่มี

APPENDIX E

RESULT OF THE I-CVI OF THE FIRST DRAFT OF THE TVRS

RESULT OF THE I-CVI OF THE FIRST DRAFT OF THE TVRS

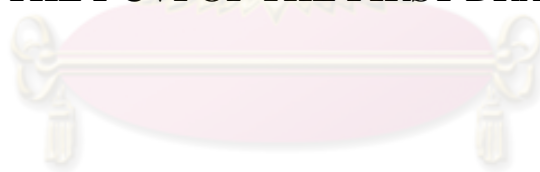| ข้อที่	คำถาม	I-CVI
	ด้านสภาพการณ์ต่างๆ	
1	ในครอบครัวของคุณมีเหตุการณ์ดังต่อไปนี้เกิดขึ้น (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่)	1
	1.1 สมาชิกในครอบครัวไม่ดูแล สนับสนุนกันและกัน (.....) มี (.....) ไม่มี	
	1.2 สมาชิกในครอบครัวมีความขัดแย้ง ไม่ลงรอยกัน (.....) มี (.....) ไม่มี	
	1.3 ไม่ได้รับการเลี้ยงดูเอาใจใส่จากสมาชิกในครอบครัว (.....) มี (.....) ไม่มี	
	1.4 ไม่มีผู้ใดในครอบครัวรับฟังความทุกข์ของคุณ (.....) มี (.....) ไม่มี	
	1.5 อาศัยอยู่ในบ้านที่มีกฎระเบียบเคร่งครัด (.....) มี (.....) ไม่มี	
2	สมาชิกในครอบครัวของคุณมีการแสดงอารมณ์ต่อไปนี้ (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่)	.89
	2.1 มุ่งร้ายต่อกัน (.....) มี (.....) ไม่มี	
	2.2 วิพากษ์วิจารณ์อย่างรุนแรงต่อกัน (.....) มี (.....) ไม่มี	
	2.3 กล่าวโทษว่าความเจ็บป่วยของคุณเป็นต้นเหตุของปัญหาในครอบครัว (.....) มี (.....) ไม่มี	
3	คุณมักถูกเพื่อนหรือคนอื่นๆดูถูก หยอกล้อ กลั่นแกล้ง คุกคาม หรือ รังแก	.78
	ด้านคุณลักษณะต่างๆ	
4	ปัจจุบันคุณมีอายุ...............ปี (ถ้ามีอายุ 40 ปี หรือ น้อยกว่า)	.89
5	ตามบัตรประชาชนระบุเพศของคุณ คือ เพศชาย	.89
6	คุณมักจะมีพฤติกรรม ความคิด หรือความรู้สึกดังต่อไปนี้ (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่)	.78
	6.1 แสดงพฤติกรรมตอบโต้รุนแรงทันทีทันใด เมื่อสิ่งที่เกิดขึ้นไม่เป็นไปอย่างที่ต้องการ (.....) มี (.....) ไม่มี	
	6.2 กระทำการใดๆเพื่อให้ได้รับผลประโยชน์มากกว่าคนอื่นเสมอ (.....) มี (.....) ไม่มี	
	6.3 รู้สึกไม่พอใจอย่างมากในทันที เมื่อสิ่งที่เกิดขึ้นไม่เป็นไปอย่างที่ต้องการ (.....) มี (.....) ไม่มี	
	6.4 โกรธหรือหงุดหงิดง่าย เมื่อเจอกับเหตุการณ์ที่ไม่ชอบ (.....) มี (.....) ไม่มี	
	6.5 มักจะทำงานไม่สำเร็จตามที่ได้รับมอบหมาย (.....) มี (.....) ไม่มี	

ข้อที่	คำถาม	I-CVI
	6.6 ปล่อยให้การกระทำผิดของตัวเองผ่านไป โดยไม่คิดถึงอีกเลย (.....) มี (.....) ไม่มี	
7	คุณต้องลาออก หรือ เคยถูกไล่ออกจากโรงเรียนกลางคัน เนื่องจากมีปัญหาด้านการเรียน	.56
8	ปัจจุบันคุณอาศัยอยู่ตามลำพัง	.78
9	คุณเข้าโรงพยาบาลเพื่อรักษาโรคจิตเภทครั้งแรกตอนอายุ 30 ปี หรือ น้อยกว่า	.89
10	คุณเคยดื่มสุราหรือใช้สารเสพติดจนเกิดเหตุการณ์ดังต่อไปนี้ (ตอบว่าเคยอย่างหนึ่งอย่างใด ก็ถือว่าใช่) 10.1 ดื่มสุราจนมีปัญหาสุขภาพ ครอบครัว หรือ ในที่ทำงาน (.....) เคย (.....) ไม่เคย 10.2 ใช้สารเสพติดจนเกิดปัญหากับเพื่อน ครอบครัว หรือ มีปัญหาสุขภาพ (.....) เคย (.....) ไม่เคย	1
11	ขณะนี้คุณไม่มีงานที่มีรายได้ตอบแทนทำ	.78
12	ในระหว่าง 6 เดือนที่ผ่านมา คุณเคยใช้กำลังหรือใช้อาวุธ ข่มขู่ คุกคาม หรือทำร้าย ผู้อื่นจนเกิดการบาดเจ็บ หรือ เสียชีวิต	1
13	คุณเคยถูกทำร้ายร่างกาย	.89
14	คุณพกพาอาวุธไว้กับตัว หรือ สามารถหยิบใช้อาวุธได้ง่าย	.78
15	ในระยะ 3 เดือนที่ผ่านมา คุณอาศัยหลับนอนในที่สาธารณะ (ริมทางเท้า ป้ายรถประจำทาง ศาลาริมถนน ใต้ทางด่วน หรือ ที่อื่นๆ)	.56
16	เมื่อคุณไม่พอใจหรือโกรธ คุณจะทำร้ายผู้อื่น ทำลายสิ่งของ หรือ ทำร้ายตนเอง	.78
	ในระหว่าง 1 สัปดาห์ที่ผ่านมา คุณมีพฤติกรรม อาการ การรับรู้ ความคิด หรือความรู้สึกดังต่อไปนี้	
17	วันนี้ วันที่........เดือน........ ปี พ.ศ............. ที่นี่เรียกว่า..................................... (ชี้ไปที่บุคคลที่คุ้นเคย) บุคคลผู้นี้คือ.......................... (หากผู้ป่วยตอบไม่ได้หรือไม่ถูกข้อใดข้อหนึ่ง ก็ถือว่าใช่)	.89
18	18.1 คุณคิดว่าคุณกำลังถูกปองร้าย หรือ ถูกกลั่นแกล้ง (.....) มี (.....) ไม่มี 18.2 คุณคิดว่าคุณมีความสามารถพิเศษ เป็นใหญ่เป็นโต หรือ มีอำนาจมาก (.....) มี (.....) ไม่มี 18.3 คุณคิดว่าความคิดหรือการกระทำของคุณถูกควบคุมด้วยอิทธิพลหรืออำนาจบางอย่าง (.....) มี (.....) ไม่มี	1

ข้อที่	คำถาม	I-CVI
	18.4 คุณคิดว่าคนอื่นกำลังพูดถึงหรือนินทาว่าร้ายคุณ (.....) มี (.....) ไม่มี 18.5 คุณคิดว่าคู่ครองหรือแฟนของคุณไปมีความสัมพันธ์กับคนอื่น (.....) มี (.....) ไม่มี (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่)	
19	19.1 คุณได้ยินเสียงบอกให้ทำร้ายคนอื่น ในขณะที่คนอื่นไม่ได้ยิน (.....) มี (.....) ไม่มี 19.2 คุณได้ยินเสียงคนพูด เสียงหวีดร้องหรือเสียงอื้ออึง ในขณะที่คนอื่นไม่ได้ยิน (.....) มี (.....) ไม่มี 19.3 คุณมองเห็นผี สัตว์ดุร้าย หรือ คน จะมาทำร้ายในขณะที่คนอื่นไม่เห็น (.....) มี (.....) ไม่มี (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่)	1
20	คุณรู้สึกตื่นเต้น กระวนกระวาย อยู่นิ่งไม่ได้	.78
21	คุณรู้สึกว่าคนรอบข้างไว้ใจไม่ได้ คอยหาโอกาสทำร้ายหรือกลั่นแกล้งคุณอยู่	.89
22	คุณรู้สึกโกรธ หรือ ขุ่นเคืองคนรอบข้าง และต้องการทำร้ายคนเหล่านั้น	.78
23	คุณรู้สึกว่าคุณสบายดีไม่ได้เจ็บป่วยใดๆ	.89
24	คุณรู้สึกร้อนรน รำคาญใจ ต้องเดินไปเดินมา พูดมาก หรือ ไม่นอน	.78
25	คุณรู้สึกเศร้า ไร้ค่า หดหู่ สิ้นหวัง ไม่มีแรงทำกิจกรรมใดๆ และบางครั้งมีความคิดไม่อยากมีชีวิตอยู่หรือพยายามทำร้ายตัวเอง	.89
26	คุณคิดว่ามีผู้อื่นคอยกำกับควบคุม คุกคามหรือนำความคิดเข้ามาใส่ในสมองของคุณ	.89
27	คุณไม่ชอบทำตามคำสั่งหรือคำขอร้องของผู้อื่น	.78
28	คุณรับประทานยาจิตเวชไม่ต่อเนื่อง บางครั้งลืมและหยุดรับประทานยาเมื่ออาการทางจิตดีขึ้น หรือ มีผลข้างเคียง	.78
29	ปัจจุบันคุณดื่มสุราหรือใช้สารเสพติดจนเกิดเหตุการณ์ดังต่อไปนี้ (ตอบว่าเคยอย่างหนึ่งอย่างใด ก็ถือว่าใช่) 29.1 ดื่มสุราจนมีปัญหาสุขภาพ ครอบครัว หรือ ในที่ทำงาน (.....) มี (.....) ไม่มี 29.2 ใช้สารเสพติดจนเกิดปัญหากับเพื่อน ครอบครัว หรือ มีปัญหาสุขภาพ (.....) มี (.....) ไม่มี	.89

APPENDIX F

27-ITEM STATEMENTS OF THE SECOND DRAFT TVRS

ศูนย์วิทยทรัพยากร

จุฬาลงกรณ์มหาวิทยาลัย

27-ITEM STATEMENTS OF THE SECOND DRAFT TVRS

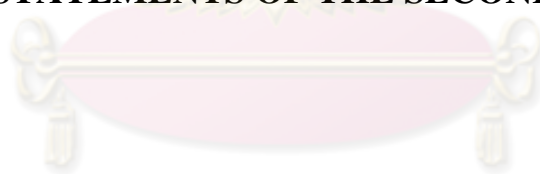| ข้อที่	คำถาม	ใช่	ไม่ใช่
	ด้านสภาพการณ์ต่างๆ		
1	ในครอบครัวของคุณมีเหตุการณ์ดังต่อไปนี้เกิดขึ้น (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่ = 3 คะแนน)		
	1.1 สมาชิกในครอบครัวไม่ดูแล สนับสนุนกันและกัน (…..) มี (…..) ไม่มี		
	1.2 สมาชิกในครอบครัวมีความขัดแย้ง ไม่ลงรอยกัน (…..) มี (…..) ไม่มี		
	1.3 ไม่ได้รับการเลี้ยงดูเอาใจใส่จากสมาชิกในครอบครัว (…..) มี (…..) ไม่มี		
	1.4 ไม่มีผู้ใดในครอบครัวรับฟังความทุกข์ของคุณ (…..) มี (…..) ไม่มี		
	1.5 อาศัยอยู่ในบ้านที่มีกฎระเบียบเคร่งครัด (…..) มี (…..) ไม่มี		
2	สมาชิกในครอบครัวของคุณมีการแสดงอารมณ์ต่อไปนี้ (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่ = 3 คะแนน)		
	2.1 มุ่งร้ายต่อกัน (…..) มี (…..) ไม่มี		
	2.2 วิพากษ์วิจารณ์อย่างรุนแรงต่อกัน (…..) มี (…..) ไม่มี		
	2.3 กล่าวโทษว่าความเจ็บป่วยของคุณเป็นต้นเหตุของปัญหาในครอบครัว (…..) มี (…..) ไม่มี		
3	คุณมักถูกเพื่อนหรือคนอื่นๆดูถูก หยอกล้อ กลั่นแกล้ง คุกคาม หรือ รังแก (ตอบใช่ = 2 คะแนน)		
	ด้านคุณลักษณะต่างๆ		
4	ปัจจุบันคุณมีอายุ…………..ปี (ถ้ามีอายุ 40 ปี หรือ น้อยกว่า) (ตอบใช่ = 2 คะแนน)		
5	ตามบัตรประชาชนระบุเพศของคุณ คือ เพศชาย (ตอบใช่ = 3 คะแนน)		
6	คุณมักจะมีพฤติกรรม ความคิด หรือความรู้สึกดังต่อไปนี้ (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่ = 3 คะแนน)		
	6.1 แสดงพฤติกรรมตอบโต้รุนแรงทันทีทันใด เมื่อสิ่งที่เกิดขึ้นไม่เป็นไปอย่างที่ต้องการ (…..) มี (…..) ไม่มี		
	6.2 กระทำการใดๆเพื่อให้ได้รับผลประโยชน์มากกว่าคนอื่นเสมอ (…..) มี (…..) ไม่มี		
	6.3 รู้สึกไม่พอใจอย่างมากในทันที เมื่อสิ่งที่เกิดขึ้นไม่เป็นไปอย่างที่ต้องการ (…..) มี (…..) ไม่มี		
	6.4 โกรธหรือหงุดหงิดง่าย เมื่อเจอกับเหตุการณ์ที่ไม่ชอบ (…..) มี (…..) ไม่มี		
	6.5 มักจะทำงานไม่สำเร็จตามที่ได้รับมอบหมาย (…..) มี (…..) ไม่มี		
	6.6 ปล่อยให้การกระทำผิดของตัวเองผ่านไป โดยไม่คิดถึงอีกเลย (…..) มี (…..) ไม่มี		
7	ปัจจุบันคุณอาศัยอยู่ตามลำพัง (ตอบใช่ = 2 คะแนน)		
8	คุณเข้าโรงพยาบาลเพื่อรักษาโรคจิตเภทครั้งแรกตอนอายุ 30 ปี หรือ น้อยกว่า (ตอบใช่ = 2 คะแนน)		

ข้อที่	คำถาม	ใช่	ไม่ใช่
9	คุณเคยดื่มสุราหรือใช้สารเสพติดจนเกิดเหตุการณ์ดังต่อไปนี้ (ตอบว่าเคยอย่างหนึ่งอย่างใด ก็ถือว่าใช่ = 3 คะแนน) 9.1 ดื่มสุราจนมีปัญหาสุขภาพ ครอบครัว หรือ ในที่ทำงาน (…..) เคย (…..) ไม่เคย 9.2 ใช้สารเสพติดจนเกิดปัญหากับเพื่อน ครอบครัว หรือ มีปัญหาสุขภาพ (…..) เคย (…..) ไม่เคย		
10	ขณะนี้คุณไม่มีงานที่มีรายได้ตอบแทนทำ (ตอบใช่ = 1 คะแนน)		
11	ในระหว่าง 6 เดือนที่ผ่านมา คุณเคยใช้กำลังหรือใช้อาวุธ ข่มขู่ คุกคาม หรือทำร้าย ผู้อื่นจนเกิดการ บาดเจ็บ หรือ เสียชีวิต (ตอบใช่ = 3 คะแนน)		
12	คุณเคยถูกทำร้ายร่างกาย (ตอบใช่ = 3 คะแนน)		
13	คุณพกพาอาวุธไว้กับตัว หรือ สามารถหยิบใช้อาวุธได้ง่าย (ตอบใช่ = 3 คะแนน)		
14	เมื่อคุณไม่พอใจหรือโกรธ คุณจะทำร้ายผู้อื่น ทำลายสิ่งของ หรือ ทำร้ายตนเอง (ตอบใช่ = 3 คะแนน)		
	ในระหว่าง 1 สัปดาห์ที่ผ่านมา คุณมีพฤติกรรม อาการ การรับรู้ ความคิด หรือความรู้สึกดังต่อไปนี้		
15	วันนี้ วันที่……..เดือน…….. ปี พ.ศ………… ที่นี่เรียกว่า……………………………. (ชี้ไปที่บุคคลที่คุ้นเคย) บุคคลผู้นี้คือ……………………… (หากผู้ป่วยตอบไม่ได้หรือไม่ถูกข้อใดข้อหนึ่ง ก็ถือว่าใช่ = 1 คะแนน)		

16	16.1 คุณคิดว่าคุณกำลังถูกปองร้าย หรือ ถูกกลั่นแกล้ง
	          (…..) มี (…..) ไม่มี
	16.2 คุณคิดว่าคุณมีความสามารถพิเศษ เป็นใหญ่เป็นโต หรือ มีอำนาจมาก
	          (…..) มี (…..) ไม่มี
	16.3 คุณคิดว่าความคิดหรือการกระทำของคุณถูกควบคุมด้วยอิทธิพลหรืออำนาจบางอย่าง
	          (…..) มี (…..) ไม่มี
	16.4 คุณคิดว่าคนอื่นกำลังพูดถึงหรือนินทาว่าร้ายคุณ
	          (…..) มี (…..) ไม่มี
	16.5 คุณคิดว่าคู่ครองหรือแฟนของคุณไปมีความสัมพันธ์กับคนอื่น
	          (…..) มี (…..) ไม่มี
	(ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่ = 3 คะแนน)		

17	17.1 คุณได้ยินเสียงบอกให้ทำร้ายคนอื่น ในขณะที่คนอื่นไม่ได้ยิน (…..) มี (…..) ไม่มี 17.2 คุณได้ยินเสียงคนพูด เสียงหวีดร้องหรือเสียงอื้ออึง ในขณะที่คนอื่นไม่ได้ยิน (…..) มี (…..) ไม่มี 17.3 คุณมองเห็นผี สัตว์ดุร้าย หรือ คน จะมาทำร้ายในขณะที่คนอื่นไม่เห็น (…..) มี (…..) ไม่มี (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่ = 3 คะแนน)		
18	คุณรู้สึกตื่นเต้น กระวนกระวาย อยู่นิ่งไม่ได้ (ตอบใช่ = 3 คะแนน)		
19	คุณรู้สึกว่าคนรอบข้างไว้ใจไม่ได้ คอยหาโอกาสทำร้ายหรือกลั่นแกล้งคุณอยู่ (ตอบใช่ = 3 คะแนน)		
20	คุณรู้สึกโกรธ หรือ ขุ่นเคืองคนรอบข้าง และต้องการทำร้ายคนเหล่านั้น (ตอบใช่ = 3 คะแนน)		
21	คุณรู้สึกว่าคุณสบายดีไม่ได้เจ็บป่วยใดๆ (ตอบใช่ = 2 คะแนน)		
22	คุณรู้สึกร้อนรน รำคาญใจ ต้องเดินไปเดินมา พูดมาก หรือ ไม่นอน (ตอบใช่ = 3 คะแนน)		

ข้อที่	คำถาม	ใช่	ไม่ใช่
23	คุณรู้สึกเศร้า ไร้ค่า หดหู่ สิ้นหวัง ไม่มีแรงทำกิจกรรมใดๆ และบางครั้งมีความคิดไม่อยากมีชีวิตอยู่หรือ พยายามทำร้ายตัวเอง (ตอบใช่ = 1 คะแนน)		
24	คุณคิดว่ามีผู้อื่นคอยกำกับควบคุม คุกคามหรือนำความคิดเข้ามาใส่ในสมองของคุณ (ตอบใช่ = 3 คะแนน)		
25	คุณไม่ชอบทำตามคำสั่งหรือคำขอร้องของผู้อื่น (ตอบใช่ = 2 คะแนน)		
26	คุณรับประทานยาจิตเวชไม่ต่อเนื่อง บางครั้งลืมและหยุดรับประทานยาเมื่ออาการทางจิตดีขึ้น หรือ มี ผลข้างเคียง (ตอบใช่ = 3 คะแนน)		
27	ปัจจุบันคุณดื่มสุราหรือใช้สารเสพติดจนเกิดเหตุการณ์ดังต่อไปนี้ (ตอบว่าเคยอย่างหนึ่งอย่างใด ก็ถือว่า ใช่ = 3 คะแนน) 27.1 ดื่มสุราจนมีปัญหาสุขภาพ ครอบครัว หรือ ในที่ทำงาน　　　　　(.....) มี　(.....) ไม่มี 27.2 ใช้สารเสพติดจนเกิดปัญหากับเพื่อน ครอบครัว หรือ มีปัญหาสุขภาพ (.....) มี　(.....) ไม่มี		

APPENDIX G

SOCIODEMOGRAPHIC DATA SHEET

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

SOCIODEMOGRAPHIC DATA SHEET FOR ITEM ANALYSIS AND EFA

แบบสอบถามข้อมูลส่วนบุคคล
คำชี้แจง: ให้ผู้ประเมินทำการสัมภาษณ์ผู้ป่วยจิตเภทตามข้อคำถามที่กำหนดไว้ โดยทำเครื่องหมาย ✔ ลงใน ช่อง ที่ตรงกับคำตอบของผู้ป่วยจิตเภท ดังต่อไปนี้
1. อายุ...............ปี
2. เพศ   ( ) ชาย   ( ) หญิง
3. ศาสนา ( ) พุทธ   ( ) คริสต์   ( ) อิสลาม   ( ) อื่น ๆ ระบุ.................
4. รายได้...............บาท/เดือน
5. สถานภาพสมรส ( ) โสด   ( ) คู่   ( ) หม้าย   ( ) หย่า/แยกกันอยู่
6. ระดับการศึกษาขั้นสูงสุด ( ) ไม่ได้เรียน   ( ) ประถมศึกษา   ( ) มัธยมศึกษาตอนต้น   ( ) มัธยมศึกษาตอนปลาย/ปวช ( ) อนุปริญญา/ปวส   ( ) ปริญญาตรี   ( ) ปริญญาโท   ( ) อื่น ๆ ระบุ......
7. อาชีพ ( ) ว่างงาน   ( ) นักเรียน/นักศึกษา   ( ) รับราชการ   ( ) รับจ้างทั่วไป ( ) รัฐวิสาหกิจ   ( ) ค้าขาย   ( ) พนักงานบริษัท/เอกชน   ( ) เกษตรกรรม ( ) อื่น ๆ ระบุ.................
8. คุณได้รับการวินิจฉัยจากแพทย์ว่าป่วยทางจิตเวชตั้งแต่อายุ...............ปี
9. คุณมีอาการป่วยทางจิตเวชมาเป็นเวลา............เดือน/ปี
10. คุณเคยเข้ารับการรักษาอาการทางจิตแบบผู้ป่วยใน ( ) ไม่เคย   ( ) เคย จำนวน............ครั้ง   ครั้งแรกตอนอายุ......ปี
11. ตั้งแต่ป่วยทางจิตเวช คุณเคยใช้กำลังหรือใช้อาวุธ ข่มขู่ คุกคาม หรือทำร้าย ผู้อื่นจนเกิดการบาดเจ็บ ( ) ไม่เคย   ( ) เคย จำนวน............ครั้ง
12. ก่อนกระทำพฤติกรรมรุนแรง คุณหยุดรับประทานยาจิตเวชหรือไม่ ( ) ไม่หยุด   ( ) หยุด ระยะเวลาที่ขาดยาครั้งสุดท้าย...............วัน/เดือน/ปี
13. ก่อนกระทำพฤติกรรมรุนแรง คุณใช้สารเสพติดหรือไม่ ( ) ไม่ใช้   ( ) ใช้ ได้แก่ (ตอบได้มากกว่า 1 ข้อ) ( ) แอลกอฮอล์   ( ) ยาม้า   ( ) กัญชา   ( ) สารระเหย ( ) โคเคน   ( ) กระท่อม   ( )เฮโรอีน   ( ) อื่นๆ ระบุ................

SOCIODEMOGRAPHIC DATA SHEET FOR CFA, PREDICTIVE

VALIDITY, AND RELIABILITY

แบบสอบถามข้อมูลส่วนบุคคล
คำชี้แจง: ให้ผู้ประเมินทำการสัมภาษณ์ผู้ป่วยจิตเภทตามข้อคำถามที่กำหนดไว้ โดยทำเครื่องหมาย ✔ ลงใน ช่อง ที่ตรงกับคำตอบของผู้ป่วยจิตเภท ดังต่อไปนี้
1. อายุ................ปี
2. เพศ   ( ) ชาย   ( ) หญิง
3. ศาสนา ( ) พุทธ   ( ) คริสต์   ( ) อิสลาม   ( ) อื่น ๆ ระบุ..............
4. รายได้..............บาท/เดือน
5. สถานภาพสมรส ( ) โสด   ( ) คู่   ( ) หม้าย   ( ) หย่า/แยกกันอยู่
6. ระดับการศึกษาขั้นสูงสุด ( ) ไม่ได้เรียน   ( ) ประถมศึกษา   ( ) มัธยมศึกษาตอนต้น   ( ) มัธยมศึกษาตอนปลาย/ปวช ( ) อนุปริญญา/ปวส   ( ) ปริญญาตรี   ( ) ปริญญาโท   ( ) อื่น ๆ ระบุ......
7. อาชีพ ( ) ว่างงาน   ( ) นักเรียน/นักศึกษา   ( ) รับราชการ   ( ) รับจ้างทั่วไป ( ) รัฐวิสาหกิจ   ( ) ค้าขาย   ( ) พนักงานบริษัท/เอกชน   ( ) เกษตรกรรม ( ) อื่น ๆ ระบุ..............
8. คุณได้รับการวินิจฉัยจากแพทย์ว่าป่วยทางจิตเวชตั้งแต่อายุ................ปี
9. คุณมีอาการป่วยทางจิตเวชมาเป็นเวลา............เดือน/ปี
10. คุณเคยเข้ารับการรักษาอาการทางจิตแบบผู้ป่วยใน ( ) ไม่เคย   ( ) เคย จำนวน.............ครั้ง   ครั้งแรกตอนอายุ......ปี
11. ตั้งแต่ป่วยทางจิตเวช คุณเคยใช้กำลังหรือใช้อาวุธ ข่มขู่ คุกคาม หรือทำร้าย ผู้อื่นจนเกิดการบาดเจ็บ ( ) ไม่เคย   ( ) เคย จำนวน.............ครั้ง
12. คุณเคยหยุดรับประทานยาจิตเวชหรือไม่ ( ) ไม่เคย   ( ) เคย ระยะเวลาที่ขาดยาครั้งสุดท้าย...................วัน/เดือน/ปี
13. ในอดีต คุณเคยใช้สารเสพติดหรือไม่   ( ) ไม่เคย   ( ) เคย ได้แก่ (ตอบได้มากกว่า 1 ข้อ) ( ) แอลกอฮอล์   ( ) ยาม้า   ( ) กัญชา   ( ) สารระเหย ( ) โคเคน   ( ) กระท่อม   ( ) เฮโรอีน   ( ) อื่นๆ ระบุ..............
14. ปัจจุบัน คุณใช้สารเสพติดหรือไม่   ( ) ไม่เคย   ( ) เคย ได้แก่ (ตอบได้มากกว่า 1 ข้อ) ( ) แอลกอฮอล์   ( ) ยาม้า   ( ) กัญชา   ( ) สารระเหย ( ) โคเคน   ( ) กระท่อม   ( ) เฮโรอีน   ( ) อื่นๆ ระบุ....................

APPENDIX H

THE SECOND DRAFT TVRS (27 ITEMS)

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

THE SECOND DRAFT TVRS (27 ITEMS)

แบบประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภท (ฉบับทดสอบ)

คำอธิบาย:

1. เครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทฉบับนี้จัดทำขึ้น เพื่อใช้ ประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทที่อาศัยอยู่ในชุมชน โดยมีเป้าหมายเพื่อป้องกันการ เกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทที่อาศัยอยู่ในชุมชน อันจะนำมาซึ่งความปลอดภัยทั้งต่อตัวผู้ป่วย บุคคลใน ครอบครัวและชุมชน ให้ดำเนินชีวิตอยู่สังคมได้อย่างสงบสุข ปราศจากความรุนแรงตลอดไป

2. เครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทประกอบด้วยข้อคำถาม จำนวน 27 ข้อ

3. รวบรวมข้อมูลโดยการสัมภาษณ์จากผู้ป่วยจิตเภทโดยตรง (Face to face interview)

4. ผู้ประเมินคือพยาบาลวิชาชีพที่มีประสบการณ์ในการดูแลผู้ป่วยจิตเภทอย่างน้อย 3 ปี

คำชี้แจง:

ให้ผู้ประเมินทำการสัมภาษณ์ผู้ป่วยจิตเภทตามข้อคำถามที่กำหนดไว้ทั้งหมดจำนวน 27 ข้อ โดยทำ เครื่องหมาย ✓ ลงในช่องที่ตรงกับคำตอบของผู้ป่วยจิตเภทตามความเป็นจริง ดังนี้

ใช่ = 1, 2, หรือ 3   คะแนน หมายถึง ผู้ป่วยจิตเภทมีคุณลักษณะหรือสภาพการณ์ดังกล่าว

ไม่ใช่ = 0   คะแนน หมายถึง ผู้ป่วยจิตเภทไม่มีคุณลักษณะหรือสภาพการณ์ดังกล่าว

ข้อที่	คำถาม	ใช่	ไม่ใช่
1	ปัจจุบันคุณมีอายุ...............ปี (ถ้ามีอายุ 40 ปี หรือ น้อยกว่าถือว่าใช่ = 2 คะแนน)		
2	ตามบัตรประชาชนระบุเพศของคุณ คือ เพศชาย (ตอบใช่ = 3 คะแนน)		
	. . . .		
26	ปัจจุบันคุณดื่มสุราหรือใช้สารเสพติดจนเกิดเหตุการณ์ดังต่อไปนี้ (ตอบว่าเคยอย่างหนึ่งอย่างใด ก็ถือว่าใช่ = 3 คะแนน) 26.1 ดื่มสุราจนมีปัญหาสุขภาพ ครอบครัว หรือ ในที่ทำงาน (.....) มี (.....) ไม่มี 26.2 ใช้สารเสพติดจนเกิดปัญหากับเพื่อน ครอบครัว หรือ มีปัญหาสุขภาพ (.....) มี (.....) ไม่มี		
27	คุณมักถูกเพื่อนหรือคนอื่นๆดูถูก หยอกล้อ กลั่นแกล้ง คุกคาม หรือ รังแก (ตอบใช่ = 2 คะแนน)		

APPENDIX I

THE THAI VIOLENCE RISK SCALE (17 ITEMS)

ศูนย์วิทยทรัพยากร

จุฬาลงกรณ์มหาวิทยาลัย

THE THAI VIOLENCE RISK SCALE (17 ITEMS)

แบบประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภท

คำอธิบาย:

1. เครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทฉบับนี้จัดทำขึ้น เพื่อใช้ประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทที่อาศัยอยู่ในชุมชน โดยมีเป้าหมายเพื่อป้องกันการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทที่อาศัยอยู่ในชุมชน อันจะนำมาซึ่งความปลอดภัยทั้งต่อตัวผู้ป่วย บุคคลในครอบครัวและชุมชน ให้ดำเนินชีวิตอยู่สังคมได้อย่างสงบสุข ปราศจากความรุนแรงตลอดไป

2. เครื่องมือประเมินความเสี่ยงต่อการเกิดพฤติกรรมรุนแรงในผู้ป่วยจิตเภทประกอบด้วยข้อคำถามจำนวน 17 ข้อ

3. รวบรวมข้อมูลโดยการสัมภาษณ์จากผู้ป่วยจิตเภทโดยตรง (Face to face interview)

4. ผู้ประเมินคือพยาบาลวิชาชีพที่มีประสบการณ์ในการดูแลผู้ป่วยจิตเภทอย่างน้อย 3 ปี

คำชี้แจง:

ให้ผู้ประเมินทำการสัมภาษณ์ผู้ป่วยจิตเภทตามข้อคำถามที่กำหนดไว้ทั้งหมดจำนวน 17 ข้อ โดยทำเครื่องหมาย ✓ ลงในช่องที่ตรงกับคำตอบของผู้ป่วยจิตเภทตามความเป็นจริง ดังนี้

ใช่ = 2 หรือ 3 คะแนน หมายถึง ผู้ป่วยจิตเภทมีคุณลักษณะหรือสภาพการณ์ดังกล่าว
ไม่ใช่ = 0 คะแนน หมายถึง ผู้ป่วยจิตเภทไม่มีคุณลักษณะหรือสภาพการณ์ดังกล่าว

ข้อที่	คำถาม	ใช่	ไม่ใช่
1	ตามบัตรประชาชนระบุเพศของคุณ คือ เพศชาย (ตอบใช่ = 3 คะแนน)		
2	คุณมักจะมีพฤติกรรม ความคิด หรือความรู้สึกดังต่อไปนี้ (ตอบว่ามีอย่างหนึ่งอย่างใด ก็ถือว่าใช่ = 3 คะแนน)		
	2.1 แสดงพฤติกรรมตอบโต้รุนแรงทันทีทันใด เมื่อสิ่งที่เกิดขึ้นไม่เป็นไปอย่างที่ต้องการ (.....) มี (.....) ไม่มี		
	2.2 กระทำการใดๆเพื่อให้ได้รับผลประโยชน์มากกว่าคนอื่นเสมอ (.....) มี (.....) ไม่มี		
	2.3 รู้สึกไม่พอใจอย่างมากในทันที เมื่อสิ่งที่เกิดขึ้นไม่เป็นไปอย่างที่ต้องการ (.....) มี (.....) ไม่มี		
	2.4 โกรธหรือหงุดหงิดง่าย เมื่อเจอกับเหตุการณ์ที่ไม่ชอบ (.....) มี (.....) ไม่มี		
	2.5 มักจะทำงานไม่สำเร็จตามที่ได้รับมอบหมาย (.....) มี (.....) ไม่มี		
	2.6 ปล่อยให้การกระทำผิดของตัวเองผ่านไป โดยไม่คิดถึงอีกเลย (.....) มี (.....) ไม่มี		
	. .		
16	คุณรับประทานยาจิตเวชไม่ต่อเนื่อง บางครั้งลืมและหยุดรับประทานยาเมื่ออาการทางจิตดีขึ้น หรือ มีผลข้างเคียง (ตอบใช่ = 3 คะแนน)		
17	ปัจจุบันคุณดื่มสุราหรือใช้สารเสพติดจนเกิดเหตุการณ์ดังต่อไปนี้ (ตอบว่ามีอย่างหนึ่งอย่างใดก็ถือว่าใช่=3คะแนน)		
	17.1 ดื่มสุราจนมีปัญหาสุขภาพ ครอบครัว หรือ ในที่ทำงาน (.....) มี (.....) ไม่มี		
	17.2 ใช้สารเสพติดจนเกิดปัญหากับเพื่อน ครอบครัว หรือ มีปัญหาสุขภาพ (.....) มี (.....) ไม่มี		
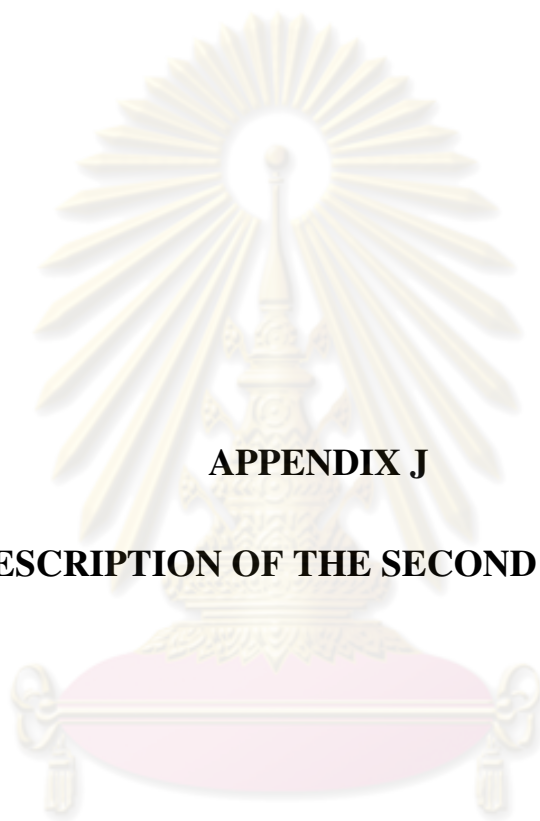
APPENDIX J

ITEM DESCRIPTION OF THE SECOND DRAFT TVRS

ITEM DESCRIPTION OF THE SECOND DRAFT TVRS

Item No.	CVI	Mean	SD	Skewness	Kurtosis	Corrected Item-Total Correlation	Chronbach's Alpha if Item Deleted	No. of samples answer "Yes" (%)
1	.89	1.5933	.80630	-1.482	.196	.203	.897	239 (79.70)
2	.89	2.5400	1.08273	-1.934	1.752	.426	.894	254 (84.70)
3	.78	1.8900	1.45083	-.541	-1.719	.713	.887	189 (63.00)
4	.78	1.6400	1.49595	-.188	-1.978	.329	.897	164 (54.70)
5	.89	1.1100	1.45083	.541	-1.719	.294	.897	111 (37.00)
6	1	.0733	.37651	4.955	22.707	.090	.898	11 (3.70)
7	.78	5600	.49722	-.243	-1.954	.085	.898	168 (56.00)
8	1	2.0100	1.41300	-.202	-1.482	.719	.887	201 (67.00)
9	.89	1.3200	1.49165	.243	-1.954	.436	.894	132 (44.00)
10	1	1.9800	1.42350	-.679	-1.549	.376	.895	198 (66.00)
11	.89	1.8900	1.45083	-.541	-1.719	.715	.887	189 (63.00)
12	.78	1.0900	1.44529	.571	-1.685	.249	.898	109 (36.30)
13	.78	1.3267	.94672	-.695	-1.528	.198	.898	199 (66.30)
14	.89	.5467	.49865	-.188	-1.978	.118	.898	164 (54.70)

Item No.	CVI	Mean	SD	Skewness	Kurtosis	Corrected Item-Total Correlation	Chronbach's Alpha if Item Deleted	No. of samples answer "Yes" (%)
15	1	1.9100	1.44529	-.571	-1.685	.725	.887	191 (63.7)
16	1	1.9400	1.43641	-.617	-1.631	.713	.887	194 (64.70)
17	.78	2.0300	1.40559	-.759	-1.433	.705	.887	203 (67.70)
18	.89	2.1000	1.37707	-.877	-1.239	.691	.888	210 (70.00)
19	.78	2.0900	1.38140	-.860	-1.269	.691	.888	209 (69.70)
20	.89	1.4133	.91210	-.912	-1.175	.726	.889	212 (70.70)
21	.78	1.9300	1.43945	-.601	-1.649	.702	.887	193 (64.30)
22	**.89**	**.1867**	**.39029**	**1.616**	**.617**	**.236**	**.897**	**56 (18.70)**
23	**.89**	**.7200**	**1.28339**	**1.224**	**-.506**	**.194**	**.899**	**72 (24.00)**
24	**.78**	**.5267**	**.88236**	**1.080**	**-.839**	**.164**	**.898**	**79 (26.30)**
25	.78	2.0000	1.41658	-.711	-1.505	.536	.891	200 (66.70)
26	.89	2.0900	1.38140	-.860	-1.269	.708	.887	209 (69.70)
27	**.78**	**.5933**	**.91510**	**.895**	**-1.208**	**.285**	**.896**	**89 (29.70)**

APPENDIX K

ITEM DESCRIPTION OF THE FINAL DRAFT TVRS
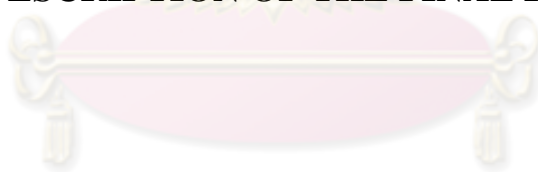
ITEM DESCRIPTION OF THE FINAL DRAFT TVRS

Item No.	CVI	Mean	SD	Skewness	Kurtosis	Corrected Item-Total Correlation	Chronbach's Alpha if Item Deleted	No. of samples answer "Yes" (%)
1	.89	2.5400	1.08273	-1.934	1.752	.426	.894	254 (84.70)
2	.78	1.8900	1.45083	-.541	-1.719	.713	.887	189 (63.00)
3	.78	1.6400	1.49595	-.188	-1.978	.329	.897	164 (54.70)
4	.89	1.1100	1.45083	.541	-1.719	.294	.897	111 (37.00)
5	1	2.0100	1.41300	-.202	-1.482	.719	.887	201 (67.00)
6	.89	1.3200	1.49165	.243	-1.954	.436	.894	132 (44.00)
7	1	1.9800	1.42350	-.679	-1.549	.376	.895	198 (66.00)
8	.89	1.8900	1.45083	-.541	-1.719	.715	.887	189 (63.00)
9	1	1.9100	1.44529	-.571	-1.685	.725	.887	191 (63.70)
10	1	1.9400	1.43641	-.617	-1.631	.713	.887	194 (64.70)
11	.78	2.0300	1.40559	-.759	-1.433	.705	.887	203 (67.70)
12	.89	2.1000	1.37707	-.877	-1.239	.691	.888	210 (70.00)
13	.78	2.0900	1.38140	-.860	-1.269	.691	.888	209 (69.70)
14	.89	1.4133	.91210	-.912	-1.175	.726	.889	212 (70.70)
15	.78	1.9300	1.43945	-.601	-1.649	.702	.887	193 (64.30)
16	.78	2.0000	1.41658	-.711	-1.505	.536	.891	200 (66.70)
17	.89	2.0900	1.38140	-.860	-1.269	.708	.887	209 (69.70)

APPENDIX L

**LISREL PRINTOUT FOR MODEL TESTING OF THE SECOND
ORDER CONFIRMATORY FACTOR ANALYSIS**

LISREL PRINTOUT FOR MODEL TESTING OF THE SECOND ORDER
CONFIRMATORY FACTOR ANALYSIS

DATE: 3/19/2011

TIME: 11:41

L I S R E L 8.52

BY

Karl G. J"reskog & Dag S"rbom

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The following lines were read from file D:\Data analysis LISREL\FIX PS 1 1 WITH CHA 15 CIR 2\PS 1 1 WITH CHA 15 CIR 2.LS8:

TI

SECOND ORDER CFA

DA NI=17 NO=604 NG=1 MA=CM

KM

1.000

.448 1.000

.040 -.030 1.000

.265 .186 .038 1.000

.074 .098 .428 .225 1.000

.143 .180 .218 .091 .180 1.000

.291 .173 .123 .285 .171 .389 1.000

.288 .240 .176 .393 .292 .398 .467 1.000

.299 .257 .125 .404 .281 .383 .513 .589 1.000

.299 .217 .142 .323 .270 .396 .514 .547 .683 1.000

.293 .262 .138 .344 .278 .370 .534 .539 .616 .602 1.000

.308 .206 .192 .296 .231 .318 .413 .456 .581 .608 .643 1.000

.311 .272 .176 .269 .302 .321 .391 .480 .544 .545 .633 .709 1.000

.192 .097 .068 .256 .195 .106 .286 .260 .301 .233 .328 .320 .343 1.000

.241 .222 .102 .325 .326 .284 .358 .429 .534 .507 .623 .566 .611 .264 1.000

.150 .071 .228 .161 .273 .292 .266 .329 .371 .303 .408 .344 .360 .245 .317 1.000

.100 .101 .370 .162 .674 .190 .180 .252 .300 .297 .280 .241 .238 .171 .261 .279 1.000

LA

Item1 Item2 Item3 Item4 Item5 Item6 Item7 Item8 Item9 Item10 Item11 Item12 Item13 Item14 Item15 Item16 Item17

MO NY=17 NK=1 NE=2 LY=FU,FI BE=FU,FI GA=FU,FI PH=SY,FR PS=FI TE=SY

LE

Cir Cha

LK

V_Risk

FR LY(1,1) LY(2,1) LY(3,2) LY(4,2) LY(5,2) LY(6,2) LY(7,2) LY(8,2) LY(9,2) LY(10,2)

FR LY(11,2) LY(12,2) LY(13,2) LY(14,2) LY(15,2) LY(16,2) LY(17,2) GA(1,1) GA(2,1) PS 1 1

FR TE 17 5 TE 13 12 TE 5 3 TE 17 3 TE 15 3 TE 10 9 TE 15 13 TE 9 8 TE 7 6 TE 10 8 TE 6 3 TE 11 8 TE 8 4 TE 9 4

FR TE 8 6 TE 13 8 TE 8 7 TE 12 8 TE 15 8 TE 16 8 TE 14 8 TE 8 1 TE 8 2 TE 6 4 TE 8 5 TE 8 3 TE 15 7 TE 5 4

FR TE 13 5 TE 15 5 TE 14 10 TE 3 2 TE 4 1 TE 12 10 TE 13 7 TE 12 7 TE 10 6 TE 16 6 TE 6 2 TE 9 6 TE 16 3 TE 12 3

FR TE 13 3 TE 12 2 TE 16 2 TE 16 7 TE 14 4 TE 14 6

PD

OU ME=ML MI SS TV RS FS SC EF ND=3 ad=OFF

TI

       Number of Input Variables 17

       Number of Y - Variables   17

       Number of X - Variables   0

       Number of ETA - Variables 2

       Number of KSI - Variables 1

       Number of Observations   604

TI

Covariance Matrix

	Item1	Item2	Item3	Item4	Item5	Item6
Item1	1.000					
Item2	0.448	1.000				
Item3	0.040	-0.030	1.000			
Item4	0.265	0.186	0.038	1.000		
Item5	0.074	0.098	0.428	0.225	1.000	
Item6	0.143	0.180	0.218	0.091	0.180	1.000
Item7	0.291	0.173	0.123	0.285	0.171	0.389
Item8	0.288	0.240	0.176	0.393	0.292	0.398
Item9	0.299	0.257	0.125	0.404	0.281	0.383
Item10	0.299	0.217	0.142	0.323	0.270	0.396
Item11	0.293	0.262	0.138	0.344	0.278	0.370
Item12	0.308	0.206	0.192	0.296	0.231	0.318

Item13	0.311	0.272	0.176	0.269	0.302	0.321
Item14	0.192	0.097	0.068	0.256	0.195	0.106
Item15	0.241	0.222	0.102	0.325	0.326	0.284
Item16	0.150	0.071	0.228	0.161	0.273	0.292
Item17	0.100	0.101	0.370	0.162	0.674	0.190

Covariance Matrix

	Item7	Item8	Item9	Item10	Item11	Item12
Item7	1.000					
Item8	0.467	1.000				
Item9	0.513	0.589	1.000			
Item10	0.514	0.547	0.683	1.000		
Item11	0.534	0.539	0.616	0.602	1.000	
Item12	0.413	0.456	0.581	0.608	0.643	1.000
Item13	0.391	0.480	0.544	0.545	0.633	0.709
Item14	0.286	0.260	0.301	0.233	0.328	0.320
Item15	0.358	0.429	0.534	0.507	0.623	0.566
Item16	0.266	0.329	0.371	0.303	0.408	0.344
Item17	0.180	0.252	0.300	0.297	0.280	0.241

Covariance Matrix

	Item13	Item14	Item15	Item16	Item17
Item13	1.000				
Item14	0.343	1.000			
Item15	0.611	0.264	1.000		
Item16	0.360	0.245	0.317	1.000	
Item17	0.238	0.171	0.261	0.279	1.000

TI

Parameter Specifications

LAMBDA-Y

	Cir	Cha
Item1	0	0
Item2	1	0
Item3	0	0

Item4	0	2
Item5	0	3
Item6	0	4
Item7	0	5
Item8	0	6
Item9	0	7
Item10	0	8
Item11	0	9
Item12	0	10
Item13	0	11
Item14	0	12
Item15	0	13
Item16	0	14
Item17	0	15

GAMMA

V_Risk

Cir	16
Cha	17

PSI

Cir	Cha
--------	--------
18	0

THETA-EPS

	Item1	Item2	Item3	Item4	Item5	Item6
	--------	--------	--------	--------	--------	--------
Item1	19					
Item2	0	20				
Item3	0	21	22			
Item4	23	0	0	24		
Item5	0	0	25	26	27	
Item6	0	28	29	30	0	31
Item7	0	0	0	0	0	32
Item8	34	35	36	37	38	39
Item9	0	0	0	42	0	43
Item10	0	0	0	0	0	46
Item11	0	0	0	0	0	0
Item12	0	52	53	0	0	0

Item13	0	0	58	0	59	0
Item14	0	0	0	64	0	65
Item15	0	0	69	0	70	0
Item16	0	75	76	0	0	77
Item17	0	0	81	0	82	0

THETA-EPS

	Item7	Item8	Item9	Item10	Item11	Item12
Item7	33					
Item8	40	41				
Item9	0	44	45			
Item10	0	47	48	49		
Item11	0	50	0	0	51	
Item12	54	55	0	56	0	57
Item13	60	61	0	0	0	62
Item14	0	66	0	67	0	0
Item15	71	72	0	0	0	0
Item16	78	79	0	0	0	0
Item17	0	0	0	0	0	0

THETA-EPS

	Item13	Item14	Item15	Item16	Item17
Item13	63				
Item14	0	68			
Item15	73	0	74		
Item16	0	0	0	80	
Item17	0	0	0	0	83

TI

Number of Iterations = 39

LISREL Estimates (Maximum Likelihood)

LAMBDA-Y

	Cir	Cha

Item1   0.738   - -

Item2   0.600   - -
        (0.079)
        7.562

Item3   - -   0.166

Item4   - -   0.415
               (0.115)
               3.614

Item5   - -   0.335
               (0.081)
               4.147

Item6   - -   0.427
               (0.113)
               3.764

Item7   - -   0.664
               (0.176)
               3.766

Item8   - -   0.672
               (0.195)
               3.448

Item9   - -   0.752
               (0.198)
               3.801

Item10   - -   0.731
               (0.193)
               3.794

Item11   - -   0.829
               (0.217)
               3.817

Item12   - -   0.773
               (0.200)
               3.872

Item13   - -   0.754
         (0.196)
          3.852

Item14   - -   0.414
         (0.114)
          3.612

Item15   - -   0.722
         (0.191)
          3.776

Item16   - -   0.475
         (0.125)
          3.786

Item17   - -   0.347
         (0.086)
          4.021

    GAMMA

      V_Risk

Cir   0.524
       (0.055)
        9.488

Cha   1.000
       (0.262)
        3.817

    Covariance Matrix of ETA and KSI

         Cir   Cha   V_Risk
       -------- -------- --------
 Cir   1.000
 Cha   0.524   1.000
V_Risk 0.524   1.000   1.000

    PHI

V_Risk

1.000

PSI

Note: This matrix is diagonal.

	Cir	Cha
	--------	--------
	0.725	- -
	(0.129)	
	5.600	

Squared Multiple Correlations for Structural Equations

	Cir	Cha
	--------	--------
	0.275	1.000

Squared Multiple Correlations for Reduced Form

	Cir	Cha
	--------	--------
	0.275	1.000

THETA-EPS

	Item1	Item2	Item3	Item4	Item5	Item6
	--------	--------	--------	--------	--------	--------
Item1	0.452					
	(0.072)					
	6.260					
Item2	- -	0.641				
		(0.058)				
		11.017				
Item3	- -	-0.080	0.967			
		(0.032)	(0.055)			
		-2.489	17.472			
Item4	0.086	- -	- -	0.826		

	(0.031)		(0.049)			
	2.768		17.026			
Item5	- -	- -	0.368	0.079	0.891	
			(0.040)	(0.025)	(0.051)	
			9.284	3.135	17.431	
Item6	- -	0.063	0.120	-0.086	- -	0.817
		(0.032)	(0.032)	(0.032)		(0.049)
		1.978	3.737	-2.664		16.801
Item7	- -	- -	- -	- -	- -	0.092
						(0.031)
						3.010
Item8	0.027	0.021	0.061	0.113	0.054	0.106
	(0.042)	(0.038)	(0.029)	(0.044)	(0.024)	(0.046)
	0.646	0.551	2.127	2.551	2.238	2.312
Item9	- -	- -	- -	0.086	- -	0.058
				(0.025)		(0.026)
				3.502		2.205
Item10	- -	- -	- -	- -	- -	0.089
						(0.027)
						3.346
Item11	- -	- -	- -	- -	- -	- -
Item12	- -	-0.053	0.087	- -	- -	- -
		(0.023)	(0.026)			
		-2.328	3.361			
Item13	- -	- -	0.067	- -	0.068	- -
			(0.027)		(0.020)	
			2.455		3.459	
Item14	- -	- -	- -	0.077	- -	-0.068
				(0.034)		(0.033)
				2.290		-2.069
Item15	- -	- -	-0.013	- -	0.070	- -
			(0.028)		(0.022)	
			-0.453		3.119	

```
Item16      - -    -0.075    0.099     - -      - -     0.092
                   (0.032)  (0.033)                   (0.033)
                   -2.323    3.021                     2.767


Item17      - -      - -     0.306     - -    0.560     - -
                            (0.039)          (0.042)
                             7.882           13.177


     THETA-EPS


        Item7    Item8    Item9    Item10   Item11   Item12
       -------- -------- -------- -------- -------- --------
Item7    0.558
        (0.038)
        14.835


Item8    0.014    0.546
        (0.058)  (0.113)
         0.238    4.841


Item9     - -     0.081    0.433
                 (0.065)  (0.029)
                  1.256   15.040


Item10    - -     0.051    0.129    0.465
                 (0.063)  (0.022)  (0.031)
                  0.818    5.878   15.011


Item11    - -    -0.017    - -      - -     0.312
                 (0.069)                   (0.023)
                 -0.241                    13.345


Item12  -0.106   -0.057    - -     0.042    - -     0.405
        (0.023)  (0.065)          (0.018)          (0.029)
        -4.513   -0.868            2.291           13.783


Item13  -0.107   -0.016    - -      - -      - -    0.128
        (0.024)  (0.064)                           (0.022)
        -4.450   -0.248                             5.806


Item14    - -    -0.024    - -    -0.067     - -      - -
                 (0.043)          (0.025)
                 -0.555           -2.694
```

```
Item15    -0.114   -0.052    - -     - -     - -     - -
          (0.025)  (0.062)
          -4.603   -0.840


Item16    -0.067   0.009     - -     - -     - -     - -
          (0.030)  (0.047)
          -2.272   0.182


Item17     - -      - -      - -     - -     - -     - -
```

THETA-EPS

```
          Item13   Item14   Item15   Item16   Item17
         --------  -------- --------  -------- --------
Item13    0.431
          (0.031)
          14.034


Item14     - -     0.829
                   (0.049)
                   17.011


Item15    0.063     - -     0.478
          (0.021)           (0.032)
          2.974             14.823


Item16     - -      - -      - -     0.777
                                     (0.046)
                                     16.726


Item17     - -      - -      - -      - -     0.880
                                             (0.051)
                                             17.141
```

Squared Multiple Correlations for Y - Variables

```
          Item1    Item2    Item3    Item4    Item5    Item6
         -------- -------- -------- -------- -------- --------
          0.547    0.360    0.028    0.173    0.112    0.182
```

Squared Multiple Correlations for Y - Variables

```
          Item7    Item8    Item9    Item10   Item11   Item12
         -------- -------- -------- -------- -------- --------
```

0.441   0.453   0.567   0.534   0.688   0.596

Squared Multiple Correlations for Y - Variables

Item13   Item14   Item15   Item16   Item17

-------- -------- -------- -------- --------

0.569   0.171   0.521   0.225   0.120

Goodness of Fit Statistics

Degrees of Freedom = 70

Minimum Fit Function Chi-Square = 88.526 (P = 0.0667)

Normal Theory Weighted Least Squares Chi-Square = 87.080 (P = 0.0814)

Estimated Non-centrality Parameter (NCP) = 17.080

90 Percent Confidence Interval for NCP = (0.0 ; 44.971)

Minimum Fit Function Value = 0.147

Population Discrepancy Function Value (F0) = 0.0283

90 Percent Confidence Interval for F0 = (0.0 ; 0.0746)

Root Mean Square Error of Approximation (RMSEA) = 0.0201

90 Percent Confidence Interval for RMSEA = (0.0 ; 0.0326)

P-Value for Test of Close Fit (RMSEA < 0.05) = 1.00

Expected Cross-Validation Index (ECVI) = 0.420

90 Percent Confidence Interval for ECVI = (0.391 ; 0.466)

ECVI for Saturated Model = 0.507

ECVI for Independence Model = 16.481

Chi-Square for Independence Model with 136 Degrees of Freedom = 9904.177

Independence AIC = 9938.177

Model AIC = 253.080

Saturated AIC = 306.000

Independence CAIC = 10030.038

Model CAIC = 701.577

Saturated CAIC = 1132.747

Normed Fit Index (NFI) = 0.991

Non-Normed Fit Index (NNFI) = 0.996

Parsimony Normed Fit Index (PNFI) = 0.510

Comparative Fit Index (CFI) = 0.998

Incremental Fit Index (IFI) = 0.998

Relative Fit Index (RFI) = 0.983

Critical N (CN) = 685.057

Root Mean Square Residual (RMR) = 0.0244

Standardized RMR = 0.0244

Goodness of Fit Index (GFI) = 0.983

Adjusted Goodness of Fit Index (AGFI) = 0.963

Parsimony Goodness of Fit Index (PGFI) = 0.450

TI

Fitted Covariance Matrix

	Item1	Item2	Item3	Item4	Item5	Item6
Item1	0.996					
Item2	0.443	1.001				
Item3	0.064	-0.028	0.995			
Item4	0.247	0.131	0.069	0.999		
Item5	0.130	0.106	0.424	0.218	1.003	
Item6	0.165	0.197	0.191	0.091	0.143	0.999
Item7	0.257	0.209	0.110	0.276	0.223	0.376
Item8	0.287	0.232	0.172	0.392	0.279	0.393
Item9	0.291	0.237	0.125	0.398	0.252	0.379
Item10	0.283	0.230	0.121	0.303	0.245	0.401
Item11	0.321	0.261	0.138	0.344	0.278	0.354
Item12	0.299	0.190	0.215	0.321	0.259	0.330
Item13	0.292	0.237	0.192	0.313	0.321	0.322
Item14	0.160	0.130	0.069	0.248	0.139	0.108
Item15	0.279	0.227	0.107	0.300	0.312	0.308
Item16	0.184	0.074	0.178	0.197	0.159	0.294
Item17	0.134	0.109	0.364	0.144	0.676	0.148

Fitted Covariance Matrix

	Item7	Item8	Item9	Item10	Item11	Item12
Item7	0.998					
Item8	0.460	0.997				
Item9	0.499	0.587	0.999			
Item10	0.485	0.542	0.679	0.999		
Item11	0.551	0.541	0.624	0.606	1.000	
Item12	0.407	0.463	0.582	0.607	0.641	1.003
Item13	0.394	0.491	0.567	0.551	0.625	0.711
Item14	0.275	0.254	0.311	0.235	0.343	0.320
Item15	0.365	0.433	0.543	0.527	0.598	0.558
Item16	0.248	0.327	0.357	0.347	0.394	0.367

Item17   0.230   0.233   0.261   0.253   0.288   0.268

Fitted Covariance Matrix

	Item13	Item14	Item15	Item16	Item17
	--------	--------	--------	--------	--------
Item13	1.000				
Item14	0.312	1.001			
Item15	0.607	0.298	0.998		
Item16	0.358	0.196	0.342	1.002	
Item17	0.262	0.143	0.250	0.165	1.000

Fitted Residuals

	Item1	Item2	Item3	Item4	Item5	Item6
	--------	--------	--------	--------	--------	--------
Item1	0.004					
Item2	0.005	-0.001				
Item3	-0.024	-0.002	0.005			
Item4	0.018	0.055	-0.031	0.001		
Item5	-0.056	-0.008	0.004	0.007	-0.003	
Item6	-0.022	-0.017	0.027	0.000	0.037	0.001
Item7	0.034	-0.036	0.013	0.009	-0.052	0.013
Item8	0.001	0.008	0.004	0.001	0.013	0.005
Item9	0.008	0.020	0.000	0.006	0.029	0.004
Item10	0.016	-0.013	0.021	0.020	0.025	-0.005
Item11	-0.028	0.001	0.000	0.000	0.000	0.016
Item12	0.009	0.016	-0.023	-0.025	-0.028	-0.012
Item13	0.019	0.035	-0.016	-0.044	-0.019	-0.001
Item14	0.032	-0.033	-0.001	0.008	0.056	-0.002
Item15	-0.038	-0.005	-0.005	0.025	0.014	-0.024
Item16	-0.034	-0.003	0.050	-0.036	0.114	-0.002
Item17	-0.034	-0.008	0.006	0.018	-0.002	0.042

Fitted Residuals

	Item7	Item8	Item9	Item10	Item11	Item12
	--------	--------	--------	--------	--------	--------
Item7	0.002					
Item8	0.007	0.003				
Item9	0.014	0.002	0.001			
Item10	0.029	0.005	0.004	0.001		
Item11	-0.017	-0.002	-0.008	-0.004	0.000	
Item12	0.006	-0.007	-0.001	0.001	0.002	-0.003

Item13	-0.003	-0.011	-0.023	-0.006	0.008	-0.002
Item14	0.011	0.006	-0.010	-0.002	-0.015	0.000
Item15	-0.007	-0.004	-0.009	-0.020	0.025	0.008
Item16	0.018	0.002	0.014	-0.044	0.014	-0.023
Item17	-0.050	0.019	0.039	0.044	-0.008	-0.027

Fitted Residuals

	Item13	Item14	Item15	Item16	Item17
	--------	--------	--------	--------	--------
Item13	0.000				
Item14	0.031	-0.001			
Item15	0.004	-0.034	0.002		
Item16	0.002	0.049	-0.025	-0.002	
Item17	-0.024	0.028	0.011	0.114	0.000

Summary Statistics for Fitted Residuals

Smallest Fitted Residual = -0.056

Median Fitted Residual = 0.001

Largest Fitted Residual = 0.114

Stemleaf Plot

- 5|620
- 4|44
- 3|86644431
- 2|8875544433320
- 1|977653210
- 0|98888776555443333222222221111000000000
  0|111111112222223444444555566666778888899
  1|11333444466688899
  2|0015557899
  3|124579
  4|249
  5|056
  6|
  7|
  8|
  9|
 10|
 11|44
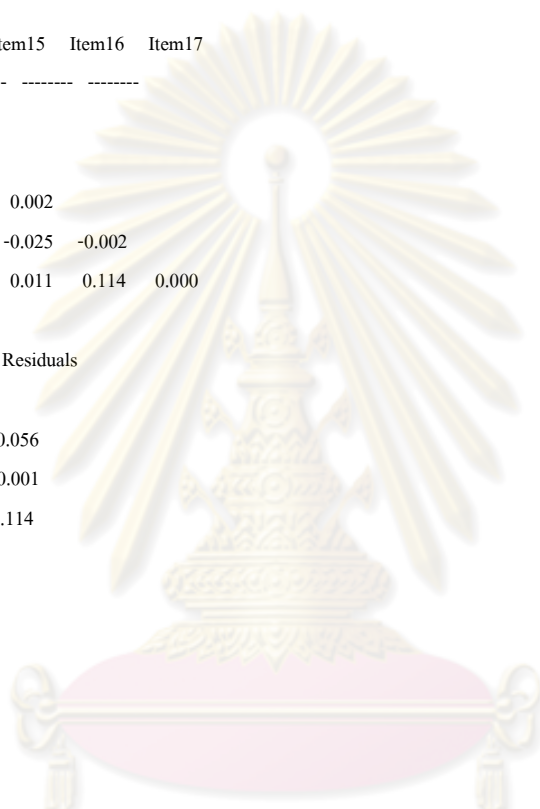
Standardized Residuals

	Item1	Item2	Item3	Item4	Item5	Item6
	--------	--------	--------	--------	--------	--------
Item1	1.368					
Item2	0.715	-0.136				
Item3	-0.670	-0.091	0.720			
Item4	1.256	1.604	-0.867	0.517		
Item5	-1.604	-0.208	0.420	0.280	-0.431	
Item6	-0.671	-1.149	1.644	0.003	1.090	0.317
Item7	1.291	-1.317	0.459	0.366	-1.909	1.470
Item8	0.108	0.919	0.514	0.171	1.519	1.085
Item9	0.341	0.870	0.001	0.761	1.242	0.744
Item10	0.682	-0.528	0.843	0.849	1.034	-0.762
Item11	-1.541	0.056	0.013	-0.017	-0.007	1.033
Item12	0.399	1.303	-2.004	-1.178	-1.284	-0.600
Item13	0.846	1.500	-1.554	-1.993	-1.173	-0.032
Item14	0.953	-0.957	-0.020	0.947	1.639	-0.284
Item15	-1.588	-0.203	-0.452	1.078	0.867	-1.059
Item16	-1.048	-0.225	3.279	-1.137	3.447	-0.339
Item17	-0.990	-0.227	0.715	0.529	-0.327	1.247

Standardized Residuals

	Item7	Item8	Item9	Item10	Item11	Item12
	--------	--------	--------	--------	--------	--------
Item7	0.609					
Item8	1.304	0.993				
Item9	0.831	0.683	0.783			
Item10	1.697	1.042	1.149	0.751		
Item11	-1.374	-0.372	-0.759	-0.364	- -	
Item12	1.001	-1.314	-0.059	0.121	0.164	-1.364
Item13	-0.554	-2.249	-1.676	-0.409	0.736	-0.596
Item14	0.441	0.857	-0.455	-0.311	-0.842	0.009
Item15	-1.156	-0.675	-0.581	-1.264	2.125	0.590
Item16	2.309	0.204	0.660	-1.984	0.870	-1.158
Item17	-1.857	2.063	1.680	1.796	-0.409	-1.223

Standardized Residuals

	Item13	Item14	Item15	Item16	Item17
	--------	--------	--------	--------	--------
Item13	0.148				
Item14	1.401	-0.783			

```
Item15    0.955   -1.448    1.368
Item16    0.102    1.534   -1.139   -2.069
Item17   -1.017    0.806    0.436    3.479    - -
```

Summary Statistics for Standardized Residuals

Smallest Standardized Residual = -2.249

 Median Standardized Residual =   0.121

 Largest Standardized Residual =   3.479

Stemleaf Plot

```
- 2|21000
- 1|9976665
- 1|444333332222211110000
- 0|988887776666555
- 0|444443333222211100000000000
 0|1111122233344444
 0|5555667777777788888888999999
 1|00000001111223333444
 1|5555666778
 2|113
 2|
 3|34
 3|5
```

Largest Positive Standardized Residuals

Residual for   Item16 and   Item3 3.279

Residual for   Item16 and   Item5 3.447

Residual for   Item17 and   Item16 3.479

TI

                  Qplot of Standardized Residuals

 3.5..

```
                  .                              ..
                  .                              ..
                  .                             .  .
                  .                            .  .
                  .                           .  .
                  .                          .    x
                  .                         .   x.
                  .                        .    x .
                  .                      .  x    .
                  .                      .  x    .
                  .                     xx  x    .
                  .                     .  x     .
                  .                     .*x      .
  N  .                               .xx*        .
  o  .                              .x*x         .
  r  .                             .*x           .
  m  .                            . xx           .
  a  .                           . xx            .
  l  .                           .x*             .
     .                          . *x*            .
  Q  .                         .x*xx             .
  u  .                         .xx               .
  a  .                        *x*                .
  n  .                        xxx                .
  t  .                        ***                .
  i  .                       *xx                 .
  l  .                       *x*                 .
  e  .                       **.                 .
  s  .                     x*x                   .
     .                     xxx                   .
     .                     x.                    .
     .                   * x                     .
     .                  x.                       .
     .                  x                        .
     .                . x                        .
     .               . x                         .
     .               . x                         .
     .              .                            .
     .             .                             .
     .            .                              .
     .           . .                             .
     .           ..                              .
  -3.5.........................................................
```

-3.5   3.5
                    Standardized Residuals

TI

Modification Indices and Expected Change

Modification Indices for LAMBDA-Y

            Cir   Cha

          -------- --------

Item1   - -   - -

Item2   - -   - -

Item3   0.001   - -

Item4   1.872   - -

Item5   1.204   - -

Item6   0.528   - -

Item7   0.382   - -

Item8   - -   - -

Item9   0.245   - -

Item10   0.011   - -

Item11   1.376   - -

Item12   0.048   - -

Item13   2.951   - -

Item14   0.024   - -

Item15   1.737   - -

Item16   0.423   - -

Item17   0.004   - -

            Expected Change for LAMBDA-Y

            Cir   Cha

          -------- --------

Item1   - -   - -

Item2   - -   - -

Item3   0.002   - -

Item4   0.109   - -

Item5   -0.049   - -

Item6   -0.045   - -

Item7   0.032   - -

Item8   - -   - -

Item9   0.021   - -

Item10   0.005   - -

Item11   -0.048   - -

```
Item12    0.010    - -
Item13    0.072    - -
Item14    0.009    - -
Item15   -0.061    - -
Item16   -0.041    - -
Item17    0.003    - -
```

Standardized Expected Change for LAMBDA-Y

```
           Cir      Cha
         -------- --------
Item1      - -      - -
Item2      - -      - -
Item3     0.002     - -
Item4     0.109     - -
Item5    -0.049     - -
Item6    -0.045     - -
Item7     0.032     - -
Item8      - -      - -
Item9     0.021     - -
Item10    0.005     - -
Item11   -0.048     - -
Item12    0.010     - -
Item13    0.072     - -
Item14    0.009     - -
Item15   -0.061     - -
Item16   -0.041     - -
Item17    0.003     - -
```

Completely Standardized Expected Change for LAMBDA-Y

```
           Cir      Cha
         -------- --------
Item1      - -      - -
Item2      - -      - -
Item3     0.002     - -
Item4     0.109     - -
Item5    -0.049     - -
Item6    -0.045     - -
Item7     0.032     - -
Item8      - -      - -
Item9     0.021     - -
Item10    0.005     - -
Item11   -0.048     - -
```

Item12	0.010	- -
Item13	0.072	- -
Item14	0.009	- -
Item15	-0.061	- -
Item16	-0.040	- -
Item17	0.003	- -

No Non-Zero Modification Indices for BETA

No Non-Zero Modification Indices for GAMMA

No Non-Zero Modification Indices for PHI

No Non-Zero Modification Indices for PSI

Modification Indices for THETA-EPS

	Item1	Item2	Item3	Item4	Item5	Item6
Item1	- -					
Item2	- -	- -				
Item3	0.001	- -	- -			
Item4	- -	1.872	0.127	- -		
Item5	1.554	0.033	- -	- -	- -	
Item6	0.528	- -	- -	- -	0.205	- -
Item7	3.705	2.789	1.432	0.010	1.589	- -
Item8	- -	- -	- -	- -	- -	- -
Item9	0.087	0.995	0.501	- -	0.303	- -
Item10	1.253	1.738	0.198	0.613	0.025	- -
Item11	2.884	0.461	0.000	0.189	0.001	1.106
Item12	0.048	- -	- -	0.201	0.614	0.456
Item13	1.331	0.615	- -	3.308	- -	0.019
Item14	2.148	2.725	1.230	- -	2.933	- -
Item15	1.652	0.002	- -	2.449	- -	0.534
Item16	0.423	- -	- -	1.941	2.971	- -
Item17	0.000	0.007	- -	0.350	- -	0.173

Modification Indices for THETA-EPS

	Item7	Item8	Item9	Item10	Item11	Item12
Item7	- -					
Item8	- -	- -				
Item9	0.087	- -	- -			

```
Item10   1.589    - -     - -     - -
Item11   1.231    - -    0.510   0.120    - -
Item12    - -     - -    0.829    - -    0.000    - -
Item13    - -     - -    1.608   0.306   0.046    - -
Item14   0.441    - -    0.216    - -    0.699   0.126
Item15    - -     - -    0.024   0.918   3.527   0.773
Item16    - -     - -    2.592   4.137   0.536   0.568
Item17   1.476    - -    0.324   1.227   0.113   0.443
```

Modification Indices for THETA-EPS

```
          Item13   Item14   Item15   Item16   Item17
         -------- -------- -------- -------- --------
Item13    - -
Item14   3.286    - -
Item15    - -    4.592    - -
Item16   0.136   2.239   1.605    - -
Item17   0.915   0.003   0.007   1.703    - -
```

Expected Change for THETA-EPS

```
          Item1    Item2    Item3    Item4    Item5    Item6
         -------- -------- -------- -------- -------- --------
Item1     - -
Item2     - -     - -
Item3    0.001    - -     - -
Item4     - -    0.047   -0.012    - -
Item5   -0.030   0.005    - -     - -     - -
Item6   -0.024    - -     - -     - -    0.012    - -
Item7    0.054  -0.048   0.035  -0.003  -0.029    - -
Item8     - -     - -     - -     - -     - -     - -
Item9   -0.007   0.023  -0.017    - -    0.010    - -
Item10   0.026  -0.032   0.011   0.021  -0.003    - -
Item11  -0.037   0.016   0.000   0.010   0.000   0.027
Item12   0.005    - -     - -   -0.010  -0.016  -0.016
Item13   0.026   0.020    - -   -0.042    - -    0.003
Item14   0.047  -0.054  -0.037    - -    0.044    - -
Item15  -0.032  -0.001    - -    0.041    - -   -0.019
Item16  -0.022    - -     - -   -0.045   0.045    - -
Item17   0.000   0.002    - -    0.019    - -    0.011
```

Expected Change for THETA-EPS

```
          Item7    Item8    Item9    Item10   Item11   Item12
```

```
          --------  --------  --------  -------  --------  --------
 Item7     - -
 Item8     - -       - -
 Item9     0.007     - -       - -
 Item10    0.031     - -       - -       - -
 Item11   -0.030     - -      -0.013    -0.007    - -
 Item12    - -       - -       0.018     - -      0.000     - -
 Item13    - -       - -      -0.022     0.011    0.004     - -
 Item14    0.021     - -      -0.012     - -     -0.020    -0.009
 Item15    - -       - -      -0.003    -0.019    0.040     0.020
 Item16    - -       - -       0.038    -0.050    0.018    -0.017
 Item17   -0.028     - -       0.011     0.022   -0.006    -0.013
```

Expected Change for THETA-EPS

```
           Item13    Item14    Item15    Item16    Item17
          --------  --------  --------  --------  --------
 Item13    - -
 Item14    0.043     - -
 Item15    - -      -0.058     - -
 Item16    0.009     0.050    -0.033     - -
 Item17   -0.024    -0.001     0.002     0.034     - -
```

Completely Standardized Expected Change for THETA-EPS

```
           Item1     Item2     Item3     Item4     Item5     Item6
          --------  --------  --------  --------  --------  --------
 Item1     - -
 Item2     - -       - -
 Item3     0.001     - -       - -
 Item4     - -       0.047    -0.012     - -
 Item5    -0.030     0.005     - -       - -       - -
 Item6    -0.024     - -       - -       - -       0.012     - -
 Item7     0.054    -0.049     0.035    -0.003    -0.029     - -
 Item8     - -       - -       - -       - -       - -       - -
 Item9    -0.007     0.023    -0.017     - -       0.010     - -
 Item10    0.026    -0.032     0.011     0.021    -0.003     - -
 Item11   -0.037     0.016     0.000     0.010     0.000     0.027
 Item12    0.005     - -       - -      -0.010    -0.016    -0.016
 Item13    0.026     0.020     - -      -0.042     - -       0.003
 Item14    0.047    -0.054    -0.037     - -       0.044     - -
 Item15   -0.032    -0.001     - -       0.042     - -      -0.019
 Item16   -0.022     - -       - -      -0.045     0.044     - -
 Item17    0.000     0.002     - -       0.019     - -       0.011
```

Completely Standardized Expected Change for THETA-EPS

	Item7	Item8	Item9	Item10	Item11	Item12
Item7	- -					
Item8	- -	- -				
Item9	0.007	- -	- -			
Item10	0.031	- -	- -	- -		
Item11	-0.030	- -	-0.013	-0.007	- -	
Item12	- -	- -	0.018	- -	0.000	- -
Item13	- -	- -	-0.022	0.011	0.004	- -
Item14	0.021	- -	-0.012	- -	-0.020	-0.009
Item15	- -	- -	-0.003	-0.019	0.040	0.020
Item16	- -	- -	0.038	-0.050	0.018	-0.017
Item17	-0.028	- -	0.011	0.022	-0.006	-0.013

Completely Standardized Expected Change for THETA-EPS

	Item13	Item14	Item15	Item16	Item17
Item13	- -				
Item14	0.043	- -			
Item15	- -	-0.058	- -		
Item16	0.009	0.050	-0.033	- -	
Item17	-0.024	-0.001	0.002	0.034	- -

Maximum Modification Index is 4.59 for Element (15,14) of THETA-EPS

TI

Factor Scores Regressions

ETA

	Item1	Item2	Item3	Item4	Item5	Item6
Cir	0.526	0.314	0.022	-0.056	-0.002	-0.041
Cha	0.018	0.032	-0.028	0.008	-0.024	-0.013

ETA

	Item7	Item8	Item9	Item10	Item11	Item12

Cir   0.057   0.004   0.040   0.017   0.044   0.078

Cha   0.189   0.119   0.089   0.076   0.212   0.179

ETA

	Item13	Item14	Item15	Item16	Item17
Cir	0.011	0.012	0.038	0.047	0.000
Cha	0.118	0.046	0.162	0.071	0.055

TI

Standardized Solution

LAMBDA-Y

	Cir	Cha
Item1	0.738	- -
Item2	0.600	- -
Item3	- -	0.166
Item4	- -	0.415
Item5	- -	0.335
Item6	- -	0.427
Item7	- -	0.664
Item8	- -	0.672
Item9	- -	0.752
Item10	- -	0.731
Item11	- -	0.829
Item12	- -	0.773
Item13	- -	0.754
Item14	- -	0.414
Item15	- -	0.722
Item16	- -	0.475
Item17	- -	0.347

GAMMA

	V_Risk
Cir	0.524
Cha	1.000

Correlation Matrix of ETA and KSI

```
          Cir      Cha    V_Risk

        --------  -------- --------

   Cir   1.000

   Cha   0.524    1.000

 V_Risk  0.524    1.000    1.000
```

PSI

Note: This matrix is diagonal.

```
          Cir      Cha

        --------  --------

         0.725     - -
```

TI

Completely Standardized Solution

LAMBDA-Y

```
          Cir      Cha

        --------  --------

 Item1   0.739     - -

 Item2   0.600     - -

 Item3    - -     0.167

 Item4    - -     0.415

 Item5    - -     0.335

 Item6    - -     0.427

 Item7    - -     0.664

 Item8    - -     0.673

 Item9    - -     0.753

 Item10   - -     0.731

 Item11   - -     0.829

 Item12   - -     0.772

 Item13   - -     0.754

 Item14   - -     0.413

 Item15   - -     0.722

 Item16   - -     0.474

 Item17   - -     0.347
```

GAMMA

```
         V_Risk

        --------
```

Cir   0.524

Cha   1.000

Correlation Matrix of ETA and KSI

          Cir   Cha   V_Risk

       -------- -------- --------

  Cir   1.000

  Cha   0.524   1.000

V_Risk   0.524   1.000   1.000

    PSI

    Note: This matrix is diagonal.

          Cir   Cha

       -------- --------

          0.725   - -

    THETA-EPS

          Item1   Item2   Item3   Item4   Item5   Item6

       -------- -------- -------- -------- -------- --------

Item1   0.453

Item2   - -   0.640

Item3   - -   -0.081   0.972

Item4   0.087   - -   - -   0.827

Item5   - -   - -   0.369   0.079   0.888

Item6   - -   0.063   0.120   -0.086   - -   0.818

Item7   - -   - -   - -   - -   - -   0.092

Item8   0.027   0.021   0.061   0.113   0.054   0.107

Item9   - -   - -   - -   0.086   - -   0.058

Item10   - -   - -   - -   - -   - -   0.089

Item11   - -   - -   - -   - -   - -   - -

Item12   - -   -0.053   0.087   - -   - -   - -

Item13   - -   - -   0.067   - -   0.068   - -

Item14   - -   - -   - -   0.077   - -   -0.068

Item15   - -   - -   -0.013   - -   0.070   - -

Item16   - -   -0.075   0.100   - -   - -   0.092

Item17   - -   - -   0.307   - -   0.559   - -

    THETA-EPS

          Item7   Item8   Item9   Item10   Item11   Item12

       -------- -------- -------- -------- -------- --------

```
Item7    0.559
Item8    0.014    0.547
Item9     - -     0.081    0.433
Item10    - -     0.052    0.129    0.466
Item11    - -    -0.017     - -      - -     0.312
Item12  -0.106   -0.057     - -     0.042     - -     0.404
Item13  -0.107   -0.016     - -      - -      - -     0.128
Item14    - -    -0.024     - -    -0.067     - -      - -
Item15  -0.114   -0.052     - -      - -      - -      - -
Item16  -0.067    0.009     - -      - -      - -      - -
Item17    - -      - -      - -      - -      - -      - -
```

THETA-EPS

```
          Item13   Item14   Item15   Item16   Item17
         -------- -------- -------- -------- --------
Item13    0.431
Item14     - -     0.829
Item15    0.063     - -     0.479
Item16     - -      - -      - -     0.775
Item17     - -      - -      - -      - -     0.880
```

TI

Total and Indirect Effects

Total Effects of X on ETA

```
          V_Risk
         --------
Cir       0.524
         (0.055)
          9.488

Cha       1.000
         (0.262)
          3.817
```

BETA*BETA' is not Pos. Def., Stability Index cannot be Computed

Total Effects of ETA on Y

```
          Cir      Cha
```

```
        -------- --------
Item1    0.738    - -

Item2    0.600    - -
        (0.079)
         7.562

Item3    - -     0.166

Item4    - -     0.415
                (0.115)
                 3.614

Item5    - -     0.335
                (0.081)
                 4.147

Item6    - -     0.427
                (0.113)
                 3.764

Item7    - -     0.664
                (0.176)
                 3.766

Item8    - -     0.672
                (0.195)
                 3.448

Item9    - -     0.752
                (0.198)
                 3.801

Item10   - -     0.731
                (0.193)
                 3.794

Item11   - -     0.829
                (0.217)
                 3.817

Item12   - -     0.773
                (0.200)
                 3.872
```

Item13   - -   0.754
          (0.196)
           3.852

Item14   - -   0.414
          (0.114)
           3.612

Item15   - -   0.722
          (0.191)
           3.776

Item16   - -   0.475
          (0.125)
           3.786

Item17   - -   0.347
          (0.086)
           4.021

    Total Effects of X on Y

    V_Risk

Item1   0.387
        (0.041)
         9.488

Item2   0.315
        (0.042)
         7.527

Item3   0.166
        (0.044)
         3.817

Item4   0.415
        (0.041)
        10.191

Item5   0.335
        (0.042)

8.044

Item6   0.427
          (0.042)
          10.214

Item7   0.664
          (0.039)
          17.107

Item8   0.672
          (0.088)
          7.619

Item9   0.752
          (0.036)
          21.018

Item10   0.731
          (0.036)
          20.023

Item11   0.829
          (0.034)
          24.256

Item12   0.773
          (0.036)
          21.422

Item13   0.754
          (0.037)
          20.620

Item14   0.414
          (0.041)
          10.159

Item15   0.722
          (0.037)
          19.575

Item16   0.475
          (0.041)

11.697

Item17   0.347
          (0.041)
           8.415

TI

Standardized Total and Indirect Effects

   Standardized Total Effects of X on ETA

        V_Risk

   Cir   0.524
   Cha   1.000

   Standardized Total Effects of ETA on Y

          Cir   Cha
        -------- --------
   Item1   0.738   - -
   Item2   0.600   - -
   Item3   - -   0.166
   Item4   - -   0.415
   Item5   - -   0.335
   Item6   - -   0.427
   Item7   - -   0.664
   Item8   - -   0.672
   Item9   - -   0.752
   Item10   - -   0.731
   Item11   - -   0.829
   Item12   - -   0.773
   Item13   - -   0.754
   Item14   - -   0.414
   Item15   - -   0.722
   Item16   - -   0.475
   Item17   - -   0.347

   Completely Standardized Total Effects of ETA on Y

          Cir   Cha
        -------- --------

Item		
Item1	0.739	- -
Item2	0.600	- -
Item3	- -	0.167
Item4	- -	0.415
Item5	- -	0.335
Item6	- -	0.427
Item7	- -	0.664
Item8	- -	0.673
Item9	- -	0.753
Item10	- -	0.731
Item11	- -	0.829
Item12	- -	0.772
Item13	- -	0.754
Item14	- -	0.413
Item15	- -	0.722
Item16	- -	0.474
Item17	- -	0.347

Standardized Total Effects of X on Y

V_Risk

Item	V_Risk
Item1	0.387
Item2	0.315
Item3	0.166
Item4	0.415
Item5	0.335
Item6	0.427
Item7	0.664
Item8	0.672
Item9	0.752
Item10	0.731
Item11	0.829
Item12	0.773
Item13	0.754
Item14	0.414
Item15	0.722
Item16	0.475
Item17	0.347

Completely Standardized Total Effects of X on Y

V_Risk

Item1   0.388
Item2   0.315
Item3   0.167
Item4   0.415
Item5   0.335
Item6   0.427
Item7   0.664
Item8   0.673
Item9   0.753
Item10   0.731
Item11   0.829
Item12   0.772
Item13   0.754
Item14   0.413
Item15   0.722
Item16   0.474
Item17   0.347

Time used: 0.125 Seconds

BIOGRAPHY

Miss Utaya Nakcharoen was born in 1971. She received a Bachelor of Nursing Science from Bangkok College of Nursing in 1995. She got a Master of Nursing Science (Psychiatric and Mental Health Nursing), faculty of nursing, Chiang Mai University in 2001. Utaya had sixteen years clinical experience in Galya Rajanagarindra Institute, Department of Mental Health, Ministry of Publish Health. She attend study Philosophy Program in Nursing Science, Faculty of Nursing, Chulalongkorn University since 2006-2010.