

**VALIDATION OF THE MALAY VERSION OF
THE INVENTORY OF CALLOUS-UNEMOTIONAL
TRAITS (ICU) AMONG ADOLESCENTS IN
PAHANG**

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Dissertation Submitted in Partial Fulfilment of the Requirements
for
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**PENGESAHAN SKALA INVENTORI SIFAT KURANG BERSIMPATI DAN
KURANG PERASAAN BELAS KASIHAN VERSI BAHASA MELAYU (M-ICU)
DALAM KALANGAN REMAJA DI PAHANG**

ABSTRAK

Pengenalan: Salah satu komponen terpenting dalam penilaian remaja-remaja yang terlibat dengan masalah tingkah laku antisosial adalah sifat kurang bersimpati (*Callousness*) dan kurang perasaan belas kasihan (*Unemotional*). Antara skala terbaik yang dapat digunakan untuk menilai sifat-sifat ini adalah Inventory of Callous-Unemotional Traits (ICU). Walaubagaimanapun, terdapat kekurangan bukti mengenai ciri-ciri psikometrik skala ini dalam konteks tempatan. Justeru, ada keperluan untuk mengesahkan versi Bahasa Melayu skala ini supaya penyelidikan lanjut dapat dijalankan berkenaan sifat-sifat kurang bersimpati dan kurang perasaan belas kasihan dalam kalangan remaja di Malaysia dan faktor-faktor yang berkaitan.

Objektif: Kajian ini bertujuan untuk mengesahkan Inventori sifat kurang bersimpati dan kurang belas kasihan versi Bahasa Melayu (M-ICU)

Metodologi: Satu kajian keratan rentas yang melibatkan 409 pelajar sekolah menengah yang berumur antara 13 hingga 18 tahun telah dijalankan antara bulan Ogos sehingga Oktober 2020 di enam buah sekolah menengah sekitar Kuantan. Peserta-peserta dipilih melalui kaedah pensampelan rawak berbilang tahap. M-ICU telah diterjemah ke Bahasa Melayu secara terjemahan hadapan dan ke belakang oleh sekumpulan panel pakar. Versi terakhir M-ICU telah diselaraskan dan pra-ujian dijalankan ke atas 10 peserta. Para pelajar yang dipilih dan bersetuju menyertai kajian serta mendapat persetujuan ibu bapa untuk menyertai kajian telah mengisi soal-selidik kertas maklumat sosio-demografi pelajar dan Inventori sifat kurang bersimpati dan kurang belas kasihan versi Bahasa Melayu (M-ICU). Analisa data merangkumi penilaian pengesahan konstruk dengan

menggunakan analisa faktor penerokaan dan pengesahan serta kebolehpercayaan gagasan.

Dapatan: Analisa faktor penerokaan (EFA) awal mendapati terdapat tiga faktor dengan dua item dipotong. EFA kemudian diulang dengan dua faktor dan hasilnya semua item dalam faktor kurang perasaan belas kasihan (*Unemotional*) dipotong. Nilai Cronbach alpha bagi keseluruhan skala meningkat dari 0.70 kepada 0.74 manakala nilai alpha bagi faktor tidak mengambil peduli (*Uncaring*) dan faktor kurang bersimpati (*Callousness*) adalah masing-masing 0.790 dan 0.674. Selepas analisa faktor pengesahan (CFA) dijalankan, model terakhir M-ICU yang paling bersesuaian dengan data terdiri daripada dua faktor utama dengan 17 soalan, berbanding versi asal dalam Bahasa Inggeris yang terdiri daripada tiga faktor dan 24 soalan. Dapatan menunjukkan kesesuaian indeks yang memuaskan (RMSEA=0.057, CFI=0.941, TLI=0.932, WRMR= 0.968).

Kesimpulan: Kajian menunjukkan skala M-ICU dengan model dua faktor utama dan 17 soalan memiliki ciri-ciri psikometrik yang memuaskan. Skala ini adalah sah dan mempunyai kebolehpercayaan untuk digunakan bagi menilai sifat-sifat kurang bersimpati dan kurang perasaan belas kasihan dalam kalangan remaja di Malaysia.

Kata Kunci: analisis faktor, kurang bersimpati, kurang perasaan belas kasihan, tingkah laku antisosial, pengesahan

**VALIDATION OF THE MALAY VERSION OF THE INVENTORY OF
CALLOUS-UNEMOTIONAL TRAITS AMONG ADOLESCENTS IN
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ABSTRACT**

Background: One of the key components in the study of antisocial behavior among adolescents is the presence of callous-unemotional (CU) traits. Among the most established tools available to measure CU traits is the Inventory of Callous-Unemotional traits (ICU). To date, information regarding the psychometric properties of this scale when used in the local context is still lacking. Therefore, there is a need to validate the Malay version of the ICU so that research can be conducted to explore on CU traits among adolescents in Malaysia and their associated factors.

Objectives: The aim of the study is to validate the Malay version of the Inventory of Callous-Unemotional Traits (M-ICU)

Methodology: A cross-sectional study involving 409 adolescents aged between 13 to 18 years old was conducted from August 2020 until October 2020 in six secondary schools in the district of Kuantan, selected via multistage random sampling method. M-ICU was initially translated into Malay using forward and backward translation procedure by a group of experts. The final version of the M-ICU was harmonized and pre-tested on 10 participants. Study participants who assented for the study and obtained parental consent then completed the final version of the M-ICU questionnaire and a socio-demographic questionnaire. Data was analysed using SPSS version 26 and MPlus software for construct validity by performing exploratory factor analysis, confirmatory factor analysis and construct reliability.

Results: In this study, initial EFA revealed three factors with two items deleted. EFA

was then repeated with two factors resulting in the deletion of items from the Unemotional factor. Cronbach alpha for overall scale improved from 0.70 to 0.74 while alpha for Uncaring and Callousness factor was 0.790 and 0.674 respectively. After CFA, the final model of the M-ICU that provided best fit to the data comprised of two factors with 17 items, compared to the original English version that has three factors with 24 items. The findings revealed acceptable fit indices (RMSEA=0.057, CFI=0.941, TLI=0.932, WRMR= 0.968).

Conclusion: The study revealed that a two-factor model with 17 items of the Malay Version of M-ICU has good psychometric properties. The scale is valid and reliable to measure callous and unemotional traits among adolescents in Malaysia.

Keywords: *Factor Analysis, callous-unemotional traits, antisocial behaviour, Validity*

CHAPTER 1 INTRODUCTION

1.1 Introduction

Conduct Disorder (CD) is a highly heterogeneous disorder with a wide variation of severity, course, and aetiology (1), with its incidence being associated with criminal involvement and social exclusion as a result as well as an accompanying range of other costs to affected individuals and the society at large. These hidden costs include physical and mental health burden to affected adolescents as adults and the cost to society for providing sustenance and financial provisions for afflicted individuals (2,3). The variability of CD manifestations has led to the difficulties in its diagnosis and management. Previous research has shown strong evidence that the affective component of psychopathy, also called callous-unemotional (CU) traits, defines an important subgroup of children and adolescents with severe conduct problems (4). CU traits are illustrated by a lack of concern about performance, absence of guilt and empathy, and a shallow and deficient affect (5). These traits are believed to be the precursor to the development of adult psychopathy (5,6). Extensive empirical research implicates callous-unemotional (CU) traits in the development of severe and persistent antisocial behaviours (7) and having poorer responses to standard interventions for antisocial behaviour (8).

Latest research has recognised the importance of CU traits as a personality trait existing separately from other facets of psychopathy. Various other research also suggests that these traits are useful for designating a subgroup of youth with serious conduct problems who differ from other antisocial youth on important biological, emotional, cognitive, and social characteristics (9). In addition, the temperamental

features related to CU traits are risk factors for impairments in conscience development in young children.

The Inventory of Callous-Unemotional Traits (ICU) was initially developed as a single scale, but is now most commonly considered as having a three-factor structure, consisting of one overall CU dimension and three subfactors which are the callous, uncaring, and unemotional subscales (9,10). These domains are used widely as research tools in studies investigating the development of psychopathic traits and antisocial behaviors (11).

Thus, it is crucial to have a specific scale that is valid and reliable for the local population to be available for screening such CU traits among our local adolescent population especially those at higher risk for aggressive or other delinquent behaviour. To the best of the researcher's knowledge, there is no published data regarding any tool validated for use in measuring CU traits among the adolescent population in Malaysia.

1.2. Justification of Study

Research on CU traits as a risk factor for the future development of antisocial behaviour and psychopathy has been increasing worldwide, thus there is a need to include this important variable in studies on young people in Malaysia. Therefore, there is an urgent need for a validated scale to measure CU traits among the local adolescent population. Findings from this study will provide a base for the development and further understanding of the factors associated with aggression among adolescents. This study may contribute to the development of early interventions for at-risk adolescents displaying CU traits to help prevent the future development of psychopathy and antisocial behaviour which would help reduce the prevalence of personality traits linked to criminality and law-breaking in the long term.

1.3 Study Objectives

1.3.1 General Objective

To determine the validity and reliability of the Malay version of the Inventory of Callous-unemotional Traits (ICU) on the school-going adolescents in Pahang.

1.3.2 Specific Objectives

1. To translate the ICU to the Malay version of Inventory of Callous-unemotional Traits (M-ICU).
2. To determine the construct validity of the M-ICU using exploratory factor analysis (EFA) among the school-going adolescents in Pahang.
3. To determine the reliability of the M-ICU using Cronbach's alpha among the school-going adolescents in Pahang.
4. To determine the construct validity of the M-ICU using confirmatory factor analysis (CFA) among the school-going adolescents in Pahang.

1.4 Methodology

The original English version of the ICU scale was translated into the Malay language by two language experts and reconciled into a single version. The translated Malay version was then back translated to English version by another language expert who had not viewed the original English version. The translated Malay version was harmonised and pre-tested on 10 respondents who consisted of children of USM lecturers and staff to produce a finalised version for the study.

The study was conducted using cross-sectional study design. The total duration of the study took approximately 18 months. The sampling frame for this study was adolescent students aged from 13 to 18 years old in schools registered under Kuantan District Education office.

1.4.1 Sample size determination

All objectives are considered for sample size determination.

- For Exploratory Factor Analysis (10)
 - Given no of items = 24 with 3 domains
 - Rule of thumb, $24 \times 5 = 120$
- For Internal consistency Hypothesis testing (11)
 - Cronbach alpha (H_0): 0.6 (lowest acceptable Cronbach alpha value)
 - Cronbach alpha (H_1): 0.8 (expected Cronbach alpha value from study)
 - Significance level (α)= 0.05, Power ($1-\beta$): 0.8
 - Number of items (k)= 24
 - Sample size= 37
 - Sample size (with drop-out)= 47
- For Confirmatory Factory Analysis (12)
 - Given no of items = 24 with 3 domains <7 constructs,
 - modest commuality, 0.5 : minimum $n=150$
- Total sample size = 270×1.5 (cluster effect) = 405
- With estimated of 20 % of non-response rate

So, total sample size needed for this study is 507 ($405/0.8$).

1.4.2 Sampling method- Multistage random sampling

After receiving prior approval from the USM Ethics committee and from the Educational policy research division of the Ministry of Education as well as Pahang state education department, the data collection process was commenced. This study was conducted using a cross-sectional method involving 409 students from the age of 13 to 18 years old who were selected from six secondary schools in Kuantan district. The six schools were randomly selected via random number generator from a list of all Government secondary schools in Kuantan. In each selected school, two to three classes were randomly selected from a list comprising all classes from Form 1 to Form 6, and all the students of the class were invited to participate in the study.

The students were provided information sheets regarding the study and those who agreed to participate were required to sign an assent form which is a combined document with a consent form that needs to be signed by one of their parents or guardian. Students with both parental consent and signed assent forms were then required to answer a proforma consisting of a socio-demographic questionnaire and the Malay version of ICU questionnaire. Data entry and analysis was done with SPSS version 26.0 and MPlus software for exploratory factor analysis, confirmatory factor analysis and construct reliability.

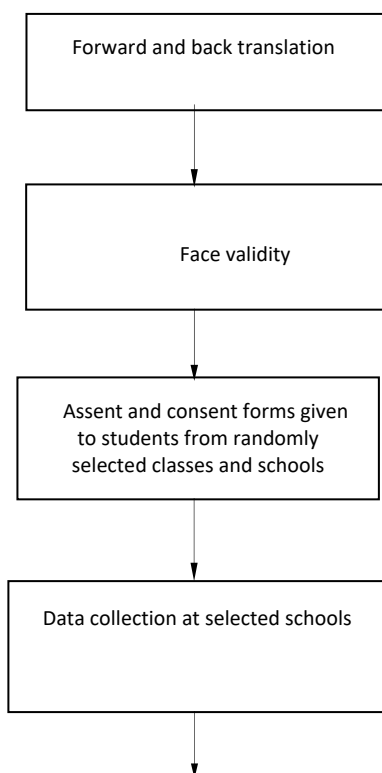
1.4.3 Inclusion Criteria

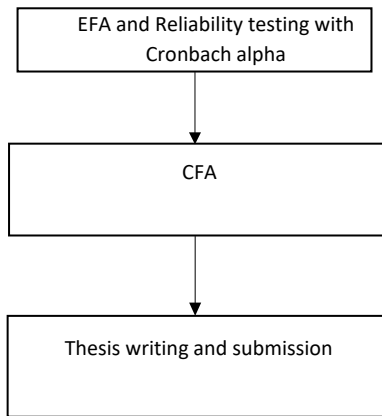
1. Students between the age of 13 to 18 years old
2. Able to read and communicate in Malay
3. Currently studying in secondary schools which are under the administration of Kuantan District Education Office (PPD)

1.4.4 Exclusion Criteria

1. Chinese national type secondary schools because of the potential difficulty in fully understanding a Malay language instrument.
2. Students with visual, hearing or other physical impairment such as limb dismemberment which would impede reading and writing since questionnaires are self-rated

1.4.5 Flow Chart Methodology





1.5 Dissertation organisation

This dissertation is arranged according to Format B Manuscript Ready based on the guidelines by Postgraduate Office, School of Medical Sciences (2016). In Chapter 2, the study protocol that was submitted for ethical approval is presented. Chapter 3 is the manuscript of Validation of Inventory of Callous-Unemotional Traits among Adolescents in Pahang that is being prepared for submission to Plos One journal. The appendices contain the validated questionnaires. The raw data is included in the attached CD.

CHAPTER 2 RESEARCH PROPOSAL

2.1 Study Protocol Submitted for Ethical Approval

INTRODUCTION AND STUDY BACKGROUND

Aggressive behaviour among adolescents is a global phenomenon but it is more prevalent in developing countries (10). Unfortunately, as an advanced developing country, Malaysia has a prevalence of 28% for aggressive behaviour among adolescents which include but not limited to bullying and physical fights (11) as compared to only 13.3% of an equivalent Dutch sample (12). This means there is an urgent need for the Malaysian government to investigate the potential factors leading to this rampant aggressive behaviour and one of the important factors that should be considered are callous-unemotional (CU) traits (7). This is also in line with the Government's recent move to shift the approach of dealing with problematic and violent students in schools from a purely punitive approach to a more rehabilitative and supportive approach via interventional programmes and community service.

An effective method to measure CU traits would go a long way towards contributing early interventions for potentially aggressive behaviour in at-risk adolescents. It has been shown that antisocial behaviour and CU traits have an asymmetrical relationship in both children and adults whereby high levels of antisocial behaviour usually occur in the absence of CU traits while paradoxically it has been shown that high levels of CU traits often occur in the presence of antisocial behaviour (13). However, several other longitudinal studies have showed that CU traits can also occur in the absence of clinical levels of antisocial behaviour (13–15). These studies conducted on large community samples of adolescents showed 'CU traits only' were

significantly associated with subclinical levels of antisocial behaviour or the potential to later develop into antisocial behaviour once reaching adulthood (16).

Furthermore, individuals with ‘CU traits only’ commonly showed increased levels of other types of impairment including poor peer relationships, low pro-sociality and increased hyperactivity. CU traits could potentially also be utilised as a useful clinical marker for psychiatric vulnerability and psychosocial maladjustment, in addition to their potential use in subtyping children with conduct disorder (16).

To date, there are no available assessment tools validated for use in the Malaysian population and the need of valid and reliable self-rated questionnaires, like the Inventory of Callousness-Unemotional Traits (ICU) (17,18) are highly needed. The common practice of performing cross-sectional semi- or unstructured clinical assessment of students involved in aggressive behaviour or bullying may be the only option at many mental health clinics whereby constraints on time, logistics and manpower impede alternative assessment avenues like conducting home and school visits to explore other possible contributing factors. Added values of a measurement tool specifically designed for measuring CU traits would be to enable objective scoring across different respondents as well as a quick screening tool, hence avoiding unwarranted reliance on clinical evaluation.

2. LITERATURE REVIEW

Extensive empirical research implicates callous-unemotional (CU) traits in the development of severe and persistent antisocial behaviour (7) and having poorer responses to standard interventions for antisocial behaviour (8). ICU was initially developed as a single scale, but is now commonly considered as having a three-factor structure, consisting of one overall CU dimension and three subfactors (19): the callous,

uncaring, and unemotional subscales. These subscales are used widely as research tools in studies investigating the development of psychopathic traits and antisocial behaviour (20).

Latest research has recognised the importance of CU traits as a personality trait existing separately from other facets of psychopathy. Various other research also suggests that these traits are useful for designating a subgroup of youth with serious conduct problems who differ from other antisocial youth on important biological, emotional, cognitive, and social characteristics (9). In addition, the temperamental features related to CU traits are risk factors for impairments in conscience development in young children. Thus, studying CU traits could further enhance the current theoretical models that explain the development of severe antisocial behavior and also psychopathy.

CU traits are also important clinically as they designate a severe and impaired subgroup of antisocial youth, being significant enough as to be included in the *DSM-5* specifier criteria for Conduct disorder as ‘*with limited prosocial emotions*’ specifier (21,22). Ever since its inclusion in the diagnostic classification, there has been an increased focus on the best avenue to assess CU traits (9). Youths with high scores of CU traits have typical characteristics such as lacking remorse or guilt, having a shallow affect, and a callous disregard for others which predisposes them to a tendency to commit crime or violate the law (4). The increased use of CU traits, separately from other domains of psychopathy, makes it important to ascertain how these traits relate to other personality constructs.

Research on the development of aggression in children has gained much attention and focus in the past decade in view of the strong association with future violent and

non-violent offending as adults (23). Various studies have shown aggressive behavior can be subdivided based on the function or purpose of the aggressive actions (24–26). They can be broadly categorised into two types of aggression, namely:

- proactive aggression: unprovoked behavior that is motivated to gain a specific external reinforcement
- reactive aggression: done in retaliation to real or perceived provocation or threat

Callous and unemotional response styles for instance a lack of guilt and empathy are found to be more related to proactive aggression (15). Other studies show these CU traits are also related to low levels of fearfulness and reduced sensitivity to punishment cues, especially when reinforced with a reward-oriented response style (15,27,28).

Prior validation studies of the ICU scale mostly conducted in Western samples for both adolescents and adults have demonstrated differential factorial structures ranging from two- to five-factors. These studies have also showed robust reliability within their respective studies with Cronbach's alpha values for the total ICU scale score ranging from 0.71 to 0.81 (17,29–31). Generally, previous exploratory factor analyses done predominantly in Western populations has shown a three-factor bifactor model, in which all the items load onto a general factor (reflected by the total ICU score) as well as onto three separately identified subfactors namely the Uncaring, Callousness, and Unemotional domains, has received the most support in the assessment for the adolescents group (19,29,31). However, this notion has been challenged with more recent studies in Asian settings such as in China, Hong Kong and Japan which favour a shorter version of the ICU scale with only two main domains which are the Uncaring and Callousness factors (18,32–34).

3. JUSTIFICATION OF STUDY

As research on CU traits as a risk factor for the future development of antisocial behaviour and psychopathy has been increasing in Western countries, there is a need to include this important variable in studies on young people in Malaysia. Thus, there is an urgent need for a validated scale to measure CU traits among the local adolescent population. Findings from this study will provide a base for the development and further understanding of the factors associated with aggression among adolescents. This study may contribute to the development of early interventions for at-risk adolescents displaying CU traits to help prevent the future development of psychopathy and antisocial behaviour which could go a long way towards helping to nurture a future generation with less prevalence of personality traits linked to criminality and law-breaking.

4. RESEARCH QUESTIONS

1. Is the Malay version of the Inventory of Callous-unemotional Traits (M-ICU) a valid measurement tool for CU traits among school-going adolescents' in Malaysia?
2. Is the M-ICU a reliable measurement tool for CU traits among school-going adolescents' in Malaysia?

5. OBJECTIVES

5.1 GENERAL OBJECTIVE

To study the validity and reliability of the Malay version of the Inventory of Callous-unemotional Traits (ICU) in the adolescent population in secondary schools of Kuantan district.

5.2 SPECIFIC OBJECTIVES

1. To translate the Inventory of Callous-unemotional Traits (ICU) to Malay language (M-ICU) to be tested among the adolescent population in Pahang.
2. To determine the construct validity of the M-ICU using exploratory factor analysis (EFA) among the adolescent population in Pahang.
3. To determine the reliability of the M-ICU using Cronbach's alpha among the adolescent population in Pahang.
4. To determine the construct validity of the M-ICU using confirmatory factor analysis (CFA) among the adolescent population in Pahang.

6. RESEARCH HYPOTHESIS

1. The Malay version of the Inventory of Callous-unemotional Traits (M-ICU) is a valid and reliable tool to measure CU traits among school-going adolescents in Malaysia.

7. THEORETICAL FRAMEWORK

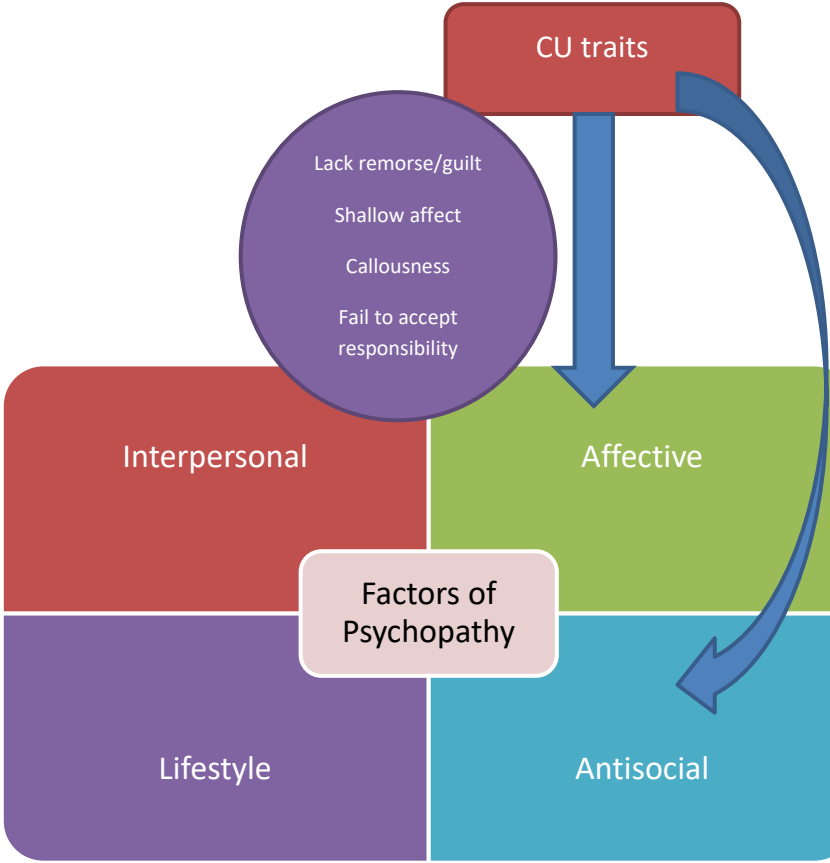


Figure 1. Theoretical framework summarising CU traits in children as the affective dimension of psychopathy later in adulthood

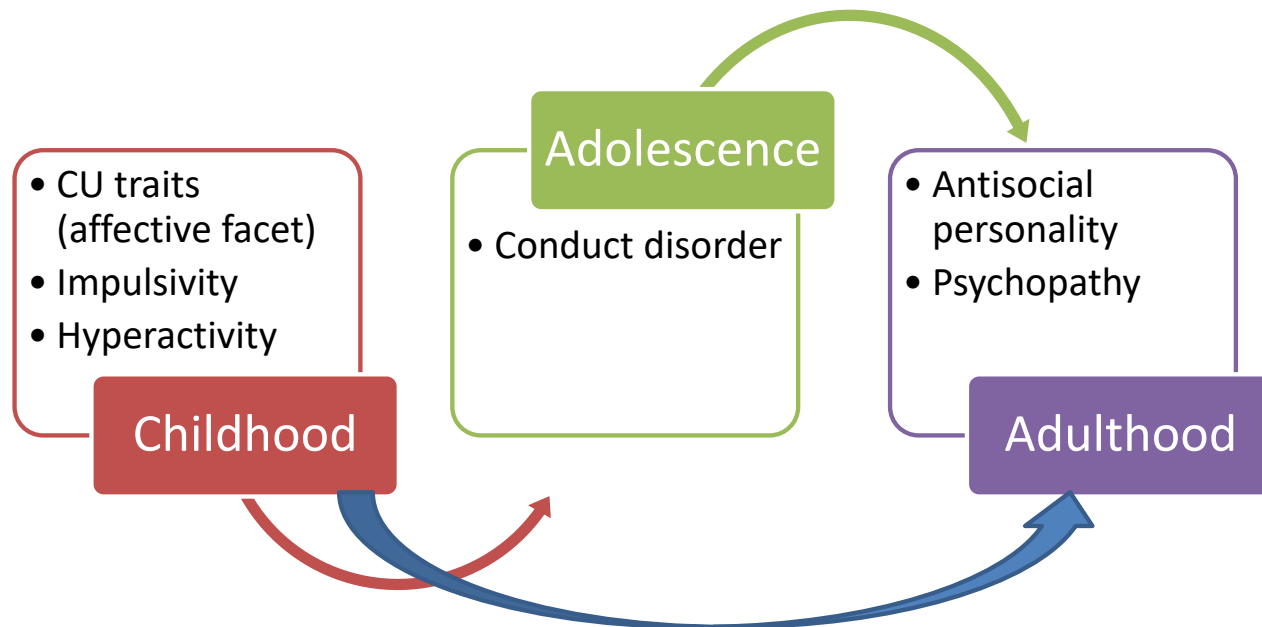


Figure 2. Theoretical framework summarising existing evidence on CU traits influencing antisocial personality traits and psychopathy later in adulthood

9. METHODOLOGY

Validation of the Malay version of the Inventory of Callous-unemotional Traits (M-ICU)

9.1 Translation Process

The method for translation is based on The Translation and Cultural Adaptation-Principles of Good Practice guideline (35).

1. **Preparation:** contact original developer for permission to use instrument, done by project supervisor and also to develop explanation of concepts in instrument to avoid any ambiguities

2. **Forward Translation:** Questionnaire will be translated by one psychiatrist and one linguist who are bilingual in both languages and blinded to the study. Translations can then be compared to enable detection of errors and any divergent interpretation of ambiguous items in the original, thus reducing the potential bias of each forward translator

Development of at least two independent forward translations by native speakers of the target language (Malay) especially those with prior experience in the translation of PRO (patient reported outcome) measures

3. **Reconciliation:** Reconciliation of the forward translations into one single forward translation that will help resolve discrepancies between the original independent translations to arrive to a final consensus translation

4. **Back Translation:** Back translation of the reconciled ICU Malay translation back into the source language (English) by a psychiatry trainee and linguist who have not viewed the original English version of the ICU questionnaire

5. Back Translation Review: Review of the back translation from Malay against the source language to ensure the conceptual equivalence of the translation

6. Harmonisation: Harmonisation of all new translations with each other and the source version. However, there are no other different Malay translated versions produced for this study

7. Cognitive Debriefing: newly translated ICU scale will be **tested for cognitive equivalence on 8 to 10 respondents** in HUSM to ensure that the translation is comprehensible to the general or patient population it's intended. These respondents consisted mostly of children of USM lecturers and staff who assented to participate and who had parental consent for the pre-test

8. Review of Cognitive Debriefing Results and Finalisation: results from cognitive debriefing are reviewed and translation modifications necessary for improvement are identified. Items and response options may be reworded based on respondents' feedback that justify making changes. There were no major words that were replaced or modified at this stage. The pre-test results showed all questions to be easily comprehensible to the intended population.

9. Proofreading: finalised translation is proofread checking for minor errors which may have been missed during the entire translation process

10. Final Report: a final report is written which will include a full description of the methodology used, plus an item-by-item representation of all translation decisions undertaken throughout the process

10.0 Study design

The present study will be conducted using cross-sectional study design.

10.1 Study duration

This study will take approximately 18 months. This entire duration will cover the timeline for the research project initiation up until the final draft submission. The tentative research timeline will be presented using Gantt chart below.

10.2 Study population and area

10.2.1 Reference population

The reference population for this research will be adolescent students aged from 13 to 18 years old in Malaysia

10.2.2 Source population

The source population for this study will be adolescent students aged from 13 to 18 years old in Kuantan. This location is chosen due to proximity to principal investigator's workplace and home.

10.2.3 Sampling frame

The sampling frame for this study will be adolescent students aged from 13 to 18 years old in schools registered under Kuantan District Education office.

10.3 Sampling method – Multistage random sampling

The list of all Government operated secondary schools in Kuantan district will be attained from the District education office (PPD). A series of random numbers will be computed, and used to select the schools to approach. Six schools will be selected.

At each particular school selected, any class from a list comprising all Form 1 to Form 6 classes will be randomly selected, and all students in the selected classes will be invited to participate in the study. A total of two to three classes would be selected from each randomly selected school. The assent of the students who are still considered minors will be obtained whereby all the students in the selected classes will be given information about the study, its objectives and possible benefits to society as well as the subsequent process if they agree. The students will be given opportunity to enquire if they have any further questions and would be given the opportunity to consider the option of joining the study or not. Once the students have understood the information provided and voluntarily agree to participate, assent and consent forms will be given to all the participants who agree in each class. The students have to sign the assent form which is a combined document with the consent form which needs to be signed by parents who consent for the participation of their children in the study. Only students with both parental consent and signed assent forms by the students will be included in the study.

Around two to three classes will be selected from each school to participate depending on the number of students who consent to participate in each class and who obtain parental consent. The researcher would target a minimum amount of 60 students irrespective of age but meeting the inclusion criteria from each school. Once this figure has been achieved, the researcher would proceed to the next school randomly selected for data collection. This is in view of the limited number of students that would be available in each school due to the social distancing rules enforced after the re-opening of schools after the Movement Control Order (MCO) period.

10.4 Sample size determination

Validation of the Malay version of ICU

All objectives are considered for sample size determination.

- For Exploratory Factor Analysis (36)
 - Given no of items = 24 with 3 domains
 - Rule of thumb, $24 \times 5 = 120$
- For Internal consistency Hypothesis testing (37)
 - Cronbach alpha (H_0): 0.6 (lowest acceptable Cronbach alpha value)
 - Cronbach alpha (H_1): 0.8 (expected Cronbach alpha value from study)
 - Significance level (α)= 0.05, Power ($1-\beta$): 0.8
 - Number of items (k)= 24
 - Sample size= 37
 - Sample size (with drop-out)= 47
- For Confirmatory Factory Analysis (38)
 - Given no of items = 24 with 3 domains <7 constructs,
 - modest communalities, 0.5 : minimum $n=150$
- Total sample size = 270×1.5 (cluster effect) = 405
- With estimated of 20 % of non-response rate
So, total sample size needed for this study is 507 ($405/0.8$).

10.5 Inclusion Criteria

1. Students between the age of 13 to 18 years old
2. Able to read and communicate in Malay

3. Currently studying in secondary schools which are under the administration of Kuantan District Education Office (PPD)

10.6 Exclusion Criteria

1. Chinese national type secondary schools because of the potential difficulty in fully understanding a Malay language instrument.
2. Students with visual, hearing or other physical impairment such as limb dismemberment which would impede reading and writing since questionnaires are self-rated
3. Students and parents who did not consent to their participation in the study.

11. Research Tools

11.1 Inventory of Callousness and Unemotional traits (ICU)

The ICU was created by expanding the CU subscale of the Antisocial Process Screening Device (APSD) into a specific measure of CU traits, consisting of 24 items. It was initially developed to tackle concerns on the poor internal reliability of CU subscale scores of other measures of psychopathy adapted for youths, for example, the Hare Psychopathy Checklist: Youth Version (39) and the Antisocial Process Screening Device (40,41).

The current ICU scale has both self-report and observer-report versions (one version for parents and one for teachers) that have been used to assess CU traits in a wide range of samples, including both males and females (31,42). The observer-report versions are suitable to assess children as young as the age of 4 years old by either parents or teachers (43,44). It has also proved useful in other distinct populations including detained children, clinically evaluated children, and children recruited from the community (19,31,42,45,46). The self-administered questionnaire consists of 24

items encompassing three main domains which are; callous (reduced empathic responding) subscale (11 items), uncaring (lack of concern about performance and relationships) subscale (8 items), and unemotional (impoverished emotional experience and expression) subscale (5 items).

All the 24 items are measured on a Likert scale ranging from 0 to 3 whereby a rating of 0 signifies 'not at all true', 1 is 'somewhat true', 2 is 'very true' and 3 means 'definitely true.' A previous meta-analysis conducted by Cardinale and Marsh in 2017 which analysed the cumulative results of 75 studies regarding the ICU has reported good internal consistency of the ICU scale with Cronbach's alpha for the total ICU, $\alpha = 0.83$, as well as the uncaring, $\alpha = 0.80$, callous, $\alpha = 0.75$, and unemotional subscales, $\alpha = 0.71$. There was also good convergent validity noted with medium to large effect sizes for the associations between measures of psychopathy and the total ICU score, $r = 0.47$, callous subscale, $r = 0.43$ and uncaring subscale, $r = 0.40$. However, the association with the unemotional subscale, $r = 0.16$, was small (20). For the purpose of this validation study, only the self-report version of the ICU scale will be used to assess CU traits among the participants in this study.

11.2 Socio-demographic Profiling Questionnaire

The Socio-demographic Profiling Questionnaire form would be utilised to collect standard demographic data of each students' individual characteristics, school variables, and background information about their parents or legal guardians.

11.3 Data Collection Method

The randomly selected students from each school will be given copies of the Subject Information and Consent Forms to be given to their parents, or legal guardians. They are given a period of one week to complete the forms, and are then required to return these forms to teacher representatives appointed in each school.

All students in the class selected to participate will be grouped together in their classrooms or hall provided in each school. They will each be given a copy of the Malay version of the Inventory of Callous-unemotional Traits (ICU), and be given a duration of 30 minutes to complete the questionnaire. A trained clinical research data coordinator who is a house officer working in a general hospital in Kuantan will assist the principal investigator in giving a simple briefing to the students during each data collection session. The participants will then have to complete the self-rated ICU scale. They will be required to answer all 24 questions on the scale and to only tick a single best answer for each question. Any wrongly ticked answers are to be crossed off and the desired answer ticked instead. The clinical research data coordinators would be available throughout the process of the students completing the questionnaire if they have any clarification or any uncertainties regarding the questions on the scale. The questionnaire should take about 20 to 30 minutes to be completed.

11.4 Data analysis

Data analysis will be conducted using SPSS and MPlus software. For objective 2, EFA will be used to explore the validity of the Malay version of the ICU. For objective 3, internal consistency will be conducted to determine the reliability of Malay version of the ICU based on Cronbach's alpha. For objective 4, CFA will be used to confirm the measurement model of ICU derived from the EFA results.

12.0 ETHICAL CONSIDERATION

12.1 Vulnerability of the study subjects

As this study hopes to enrol subjects who are in their adolescence, the following vulnerabilities need to be recognised and addressed:

1. Suggestibility

Defined as the act of incorporating suggestions, or the beliefs of others, into one's own report, due to interactions with others (47). The young adolescent may provide answers which are based on his / her perception of what would please the adult-counterparts. To counter the possibility of this vulnerability, care must be taken to avoid suggestive interviewing techniques (e.g., asking leading questions, or appearing to favour specific statements). For this study, the participants are encouraged to answer as honestly and truthfully as possible, and they are assured of the anonymity of their answers in the questionnaires.

2. Legal authority

The Laws of Malaysia Act 21: Age of Maturity Act 1971 states that the age of a minor is below 18 years old, and so they do not have the capacity to give valid consent. In accordance to the Law Reform (Marriage and Divorce) Act 1976, each parent has full responsibility for his or her children who is under the age of 18, and therefore the consent of either parent is a requisite for participation in any study (48).

3. Stigmatisation

As highlighted earlier in the 'Possible Risks of Participation in Study' segment, all the participants recruited for the study would not be subject to any separate interview or follow-up session. However, there might still be a lingering possibility of stigmatisation by fellow students and their respective parents of students who have aggressive or bullying tendencies or other features of Conduct disorder, and they might be the subject of scorn and be unfairly