

DEDICATION

*To my dear late mother,
my father,
My beloved brother and my sisters*

and

Professor, Dr Mohmad Jafar Modabernia

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirements for the degree of Doctor of Philosophy

**DEVELOPMENT OF ANXIETY AND DEPRESSION INVENTORY
FOR SECONDRY SCHOOL STUDENTS IN IRAN**

By

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The purpose of the study was: (1) To determine the validity of A&D Inventory to measure anxiety and depression in secondary schools; (2) To determine the reliability of A&D Inventory in measuring anxiety and depression in secondary schools. The participants constituted of 579 students from the secondary school, whom were selected from teenagers who live in north of Iran in 2011-2012. Item pool generation was guided by the operational definition of the construct measured by the two theories: First, the Tripartite Model, and the second theory is the cognitive content specificity.

The instrument has been devised and validated through a scientific method to ensure its reliability and validity. The results provide evidence that the developed instrument achieved sound psychometric properties. The overall reliability value of Cranach's

Alpha was .87. Also by Using EFA, the Anxiety & Depression inventory (A&D inventory) construct produced two significant factors. The hypothesized two-factor model identified via EFA in the Study consisted of 32 items, with 16 items belonging to anxiety and 16 items to depression.

The CFA results showed that the goodness-of-fit indices for the revised model were as follows: $\chi^2 = 2111.222$, $DF=403$, $CMIN/DF= 3.785$, $GFI=.920$, $CFI=.937$, $NFI=.912$, $TLI=.908$ and $RMSEA =.047$; each of the indices was the threshold values.

To assess the convergent, construct reliability (CR), average variance extracted (AVE) method and discriminant validity were obtained. The construct reliability of all latent variables in this study was 0.95 in anxiety and 0.97 in depression. The average variance extracted values of latent variables in this table were between 0.78 in anxiety and 0.81 in depression and the last, AVE was greater than the squared correlation that demonstrated satisfactory discriminant validity.

Evidence for the convergent validity of the A&D Inventory demonstrated through its significant high correlation between anxiety items of A&D Inventory with BAI items were .80 and high correlation depression items of the A&D Inventory with BDI (.89).

Divergent validity of the A&D Inventory was demonstrated through its significant low correlation anxiety items of the A&D Inventory with BDI (.45) and low correlation depression items of the A&D Inventory with the BAI (.41).

The overall test-retest reliability value of Cronbach's Alpha was .90.

The A&D Inventory is simple, brief, and easy to administer. Indeed, the entire 32-item A&D Inventory takes no longer to complete than other symptom measures. Overall,

therefore, the A&D Inventory can provide differentiated symptoms between anxiety and depression in a very quick and efficient manner for Iranian secondary schools.

The measurement invariance of the Model across samples was done to test the factorial validity of the instrument. There is no significant difference between male and female in this study. The results of this study suggest that the items do not measure differences between male and female respondents. Overall, therefore, the A&D Inventory can provide differentiated symptom assessment in a very quick and efficient manner for Iranian secondary schools.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**PEMBANGUNAN INVENTORI KEBIMBANGAN DAN INVENTORI
KEMURUNGAN UNTUK PELAJAR SEKOLAH MENENGAH DI IRAN**

Oleh

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Tujuan kajian ini adalah untuk: (1) menentukan kesahihan daftar barangan A&D bagi mengukur tahap kebimbangan dan kemurungan di kalangan remaja; (2) menentukan kebolehpercayaan daftar barangan A&D bagi mengukur tahap kebimbangan dan kemurungan di peringkat sekolah menengah. Subjek bagi kajian ini adalah seramai 579 pelajar dari sekolah menengah dan mereka dipilih dari kalangan remaja yang tinggal di utara Iran pada tahun 2011-2012. *Item pool generation* telah dijadikan panduan berdasarkan definasi operasi yang diukur menggunakan dua teori berkaitan: Model Tripartite dan teori kandungan ketepatan kognitif.

Alatan yang digunakan untuk kajian ini telah dicipta dan disahkan melalui kaedah saintifik untuk memastikan kesahihan dan keboleh-percayaannya. Hasilnya, alat yang dicipta telah mencapai ciri-ciri psikometrik yang sesuai. Nilai keseluruhan tahap keboleh

percayaan Alpha Cranach mencatatkan .87. Malahan, dengan menggunakan EFA, daftar barangan Kebimbangan dan Kemurungan (A&D inventory) menghasilkan dua faktor yang signifikan. Hipotesis dua-faktor model yang dikenal pasti melalui EFA mempunyai 32 item, dengan 16 item mewakili kebimbangan dan 16 item lagi mewakili kemurungan.

Keputusan CFA menunjukkan bahawa indeks kebaikan-patut bagi model yang telah dikaji semula adalah seperti berikut: $\chi^2 = 2111.222$, $DF=403$, $CMIN/DF= 3.785$, $GFI=.920$, $CFI=.937$, $NFI=.912$, $TLI=.908$ and $RMSEA =.047$; di mana setiap satu indeks adalah ambang nilai.

Bagi menguji pertembungan pembentukan keboleh percayaan (CR), kaedah cabutan purata berlawanan (AVE) dan kesahihan pembezaan telah diperolehi. Pembentukan keboleh percayaan (CR) bagi semua pemboleh ubah tersembunyi dalam kajian ini adalah 0.95 bagi kebimbangan dan 0.97 bagi kemurungan. Nilai AVE bagi pemboleh ubah tersembunyi di dalam jadual ini adalah di antara 0.78 bagi kebimbangan dan 0.81 bagi kemurungan. Pada dasarnya, AVE sepatutnya lebih besar nilainya berbanding dengan korelasi kuasa dua bagi menunjukkan kesahihan pembezaan yang memuaskan. Nilai AVE adalah 0.5 lebih besar berbanding dengan 0.5 penentuan pertembungan yang mencukupi.

Bukti bagi kesahihan pertembungan untuk daftar barangan A & D telah ditunjukkan melalui hubung kait yang tinggi antara perkara kebimbangan daripada daftar barangan A & D dengan perkara BAI adalah sebanyak 0.80 dan hubung kait yang tinggi juga bagi perkara kemurungan daripada daftar barangan A & D BDI sebanyak (.89).

Selain daripada itu, bukti bagi kesahihan pembezaan daripada daftar barangan A & D telah ditunjukkan melalui hubung kaitnya yang rendah terhadap perkara kebimbangan daripada daftar barangan A & D dengan catatan BDI (.45) dan hubung kait yang sedikit terhadap perkara kemurungan daripada daftar barangan A & D BAI dengan catatan hanya (41).

Ujian dan ujian semula keboleh percayaan yang telah digunakan dalam selang masa 2 minggu melaporkan bahawa $r = .703$ bagi kebimbangan, $r = .841$ bagi kemurungan dan $r = .725$ bagi keseluruhan perkara. Secara amnya, keputusan yang diperolehi telah mempamerkan tahap keboleh percayaan yang sederhana.

Daftar barangan A & D adalah suatu alat yang mudah, ringkas dan senang untuk diuruskan. Malah, kesemua 32 perkara daftar barangan A & D mengambil masa yang singkat untuk digunakan berbanding alat-alat pengukur yang lain. Secara keseluruhannya, daftar barangan A & D boleh memberi perbezaan gejala antara kebimbangan dan kemurungan dalam suatu cara yang cekap dan pantas bagi remaja di Iran.

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I certify that a Thesis Examination Committee has met on 30/10/2012 to conduct the final examination of Mahnaz Fallahi Khesht Masjedi on her thesis entitled "**Development of anxiety inventory and depression inventory for secondary school students in Iran**" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U. (A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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DECLARATION

I declare that the thesis is my original work except for quotations and citations, which have been duly acknowledged. I also declare that it has not been previously and is not concurrently submitted for any other degree at Universiti Malaysia Putra or at any other institutions.

MAHNAZ FALLAHI KHESHT MASJEDI

Date: 30 October 2012

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LIST OF ABBREVIATION

AGFI	Adjusts the Goodness-of-Fit statistic
ANOVA	Analysis of Variance
AVE	Average variance extracted
BAI	Beck Anxiety Inventory
BDI	Beck depression inventory
CCS	Cognitive content-specificity
CDI	Children's Depression Inventory
CES-D	Center for Epidemiological studies Depression scale
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CTT	Classical test theory
Dass42	Depression Anxiety Stress Scale 42
DMS	American Psychiatric Association
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders IV
DSM-IV-TR	The Diagnostic and Statistical Manual of Mental Disorders, 4th edition text revision
EFA	Exploratory factor analysis
EPDS	Edinburgh Postnatal Depression Scale
FA	Factor analysis
GAD	Generalized Anxiety Disorder
GFI	Goodness-of-Fit statistic
IDEA	Individuals with Disabilities Education Act
IDS	Inventory of Depression Symptomatology

KADS	Kutcher Adolescent Depression Scale
MASC	Multidimensional Anxiety Scale for Children
NA	Negative affect
OCD	Obsessive-compulsive disorder
PA	Positive affect
PAF	Principle Axis Factoring
PC	Principal Components
PCLOSE	P-values
PH	Physiological hyperarousal
RCMAS	Revised Children's Manifest Anxiety Scale
RMSEA	Root mean square error of approximation
SCAS	Spence Children's Anxiety Scale
SCL-90-R	Symptom Checklist-90-Revised
SEM	Structural equation modeling
STAI	State-Trait Anxiety Inventory
STAIC	State-Trait Anxiety Inventory for Children
W.H.O	World Health Organization
Zung SDS	Zung Self-Rating Depression Scale
χ^2	Model Chi-Square