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PSYCHOMETRIC EVALUATION OF URDU VERSION OF COGNITIVE HARDINESS SCALE IN PAKISTANI CONTEXT



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CERTIFICATE OF APPROVAL

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Psychometric Evaluation of Urdu Version of Cognitive Hardiness Scale in Pakistani
Context

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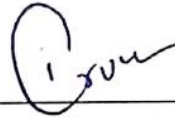
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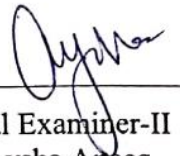
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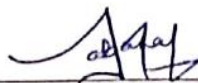
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**Arooba Arshad****BSP193045****July, 2023**

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ABSTRACT

Cognitive hardiness influences both personal and professional life requires to be measured through an accurate and valid scale. Despite availability of standardized psychological scales available in English language for cognitive hardiness, there is a dearth of validated psychological scales available in the Urdu language. Thus, cross-sectional study evaluated the psychometric properties of the Cognitive Hardiness Scale (Nowack, 1990) in the Pakistani context. The sample consisted of 414 university students of age 18 years and above from Rawalpindi and Islamabad. Construct validity of the scale was examined using confirmatory factor analysis (CFA). Based on poor fit of the model obtained for single factor structure (CFI=.55, RMSEA =.06 (CI=.05-.06) in Pakistani context, indicating possible influence of culture, EFA followed by CFA using MLR was performed. For that purpose data was divided into equal halves. one was utilized in EFA and the other in CFA. The final 3 factor structure showed good fit indices (CFI=.92, RMSEA=.03 (CI=.01-.04)). The study also explored the convergent validity and reliability of the scale. In addition, the study explored the extent of hardiness among Pakistani population with respect to gender, age and socioeconomic status. The results of the CFA showed that best fitting model reflected three factor structure with 23 indicators, as seven items that performed poorly were eliminated from the final scale. The modified scale showed satisfactory internal consistency reliability of commitment (.68) and challenge (.71) subscales. The control subscale, however, has weak reliability (.58). The convergent validity is also evident by statistically significant moderate negative correlation of the commitment ($r=-.417$, $p<0.01$) and challenge ($r=-.404$, $p<0.01$) subscale with anxiety subscale of HADS, and with depression subscale commitment ($r=-.505$, $p<0.01$) and challenge ($r=-.294$, $p<0.01$) subscale also has

significant negative correlation. Unexpectedly, control subscale showed insignificant relation with anxiety and depression.

Overall, 23 item cognitive hardiness scale (CHS) was found to be statistically sound as depicted by low to moderate internal consistency reliabilites of subscales and evidence for convergent validity. Moreover, the results of Mann whitney and Kruskal Wallis test indicated that there was no significant gender ($U=37711$, $p>0.05$), and socioeconomic difference ($H(2) = .23$, $P>0.05$), indicating that maybe other factors like culture social norms and individual differences to have more influence on hardiness. However, there is significant positive association between age and hardiness ($r=.202$, $p<0.01$) indicating that with increase in age the hardiness increases.

Based on study results it is concluded that three factors of hardiness are identifiable in modified CHS scale in Pakistani context. Therefore, the three dimensions of hardiness must be considered when assessing extent of hardiness. The low to moderate internal consistency reliabilites of subscales and evidence for convergent validity indicating that scale has reasonable psychometric properties. Future studies should further test new 3 factor structure of CHS in larger population to corroborate the results of the present study.

Key words: Cognitive hardiness, Validation, Urdu language, Pakistani population, Factor analysis, Psychometric properties

TABLE OF CONTENTS

ACKNOWLEDGMENTS	v
ABSTRACT	vi
LIST OF FIGURES	x
LIST OF TABLES	xi
LIST OF APPENDICES	xii
LIST OF ABBREVIATIONS	xiii
LIST OF SYMBOLS	xiv
Chapter 1	1
Introduction	1
Components of Hardiness	2
Literature Review	3
<i>Importance of Hardiness</i>	4
<i>Gender and Hardiness</i>	6
<i>Age and Hardiness</i>	6
<i>Socioeconomic and Hardiness</i>	7
<i>Hardiness in Pakistan</i>	8
<i>Hardiness Scales</i>	9
Dispositional Resilience Scale	11
Personal Views Survey	12
Psychological Hardiness	12
Health-Related Hardiness	13
Family Hardiness Index	13
Occupational Hardiness Scale	14
Cognitive Hardiness Scale	14
Theoretical Framework	15
Rationale	16
Research Objectives	19
Hypotheses	19
Chapter 2	20
Methodology	20
Study Design	20
Phases of study	20
<i>Phase 1</i>	20
<i>Phase 2</i>	20
<i>Phase 3</i>	20
Locale	20
Ethical Consideration	21
Translation of the Cognitive Hardiness Scale	22
<i>Forward Translation</i>	22
<i>Back-Translation</i>	23
<i>Judgement of Equivalence</i>	23
Cognitive Interviews	24
Population and Sample	25
<i>Inclusion Criteria</i>	26
<i>Exclusion Criteria</i>	26
Instruments	26

<i>Demographic sheet</i>	26
<i>Cognitive Hardiness Scale (CHS)</i>	26
<i>Hospital Anxiety and Depression Scale</i>	28
Main Study Procedure	30
Data Analyses	30
Chapter 3	32
Results	32
Sample Characteristics	32
Descriptive Statistics of Cognitive Hardiness Scale and Hospital Anxiety and Depression Scale	39
Reliabilities of the Scales	43
Factor analysis of CHS	44
<i>Results of Hypothesized Model</i>	46
<i>EFA analysis with 207 sample</i>	46
1-Factor model	47
2-Factor model	47
3-Factor model	48
<i>CFA analysis with 207 sample</i>	50
Cronbach Alpha Reliability of the Final CHS Version	54
Convergent Validity Analysis of CHS	55
<i>There is a significant difference in cognitive hardiness of male and female.</i>	57
<i>There is a significant association between cognitive hardiness and age.</i>	58
<i>There is a significant difference between cognitive hardiness and perceived socioeconomic status</i>	58
Chapter 4	60
Discussion	60
Demographic characteristics	60
Factor Analysis	67
Reliability Analysis	70
Validity Analysis	70
Gender, Age and perceived Socioeconomic Difference in Hardiness	71
Conclusion	73
Limitations	74
Implications/Recommendations	75
References	76
Appendices	96
Appendix A	96
Appendix B	97
Appendix C	99
Appendix D	100
Appendix E	102
Appendix F	106
Appendix G	110
Appendix H	111
Appendix I	116
Appendix J	118

LIST OF FIGURES

Figure 1 Distribution of Age in years ($n=414$)..	35
Figure 2 Distribution of scores on Cognitive Hardiness Scale (CHS) ($n=414$).....	40
Figure 3 Distribution of scores on HADS anxiety subscale ($n=414$).	41
Figure 4 Distribution of scores on HADS depression subscale ($n=414$).....	42
Figure 5 Hypothesized factor structure diagram of CHS.....	45
Figure 6 Final CHS model($n=207$).	52

LIST OF TABLES

Table 1 Sociodemographic characteristics of sample ($n=414$).	32
Table 2 Descriptive statistics of scales used in the study ($n=414$).	39
Table 3 Cronbach's alpha reliability with mean and standard deviations of the Cognitive Hardiness Scale and Hospital Anxiety and Depression Scale ($n=414$).	43
Table 4 The indexes for the estimated models with 1-factor, 2-factor and 3-factor model ($n=207$).	47
Table 5 Results from factor analysis of the Cognitive Hardiness Scale ($n=207$).	48
Table 6 Variance accounted for (R^2) by CHS items ($n=207$).	53
Table 7 Cronbach alpha reliability of the final CHS version along with mean, standard deviation, skewness and kurtosis value ($n=207$).	54
Table 8 Correlation of the original CHS version with HADS subscales ($n=414$).	55
Table 9 Correlation of the scales after modification of CHS ($n=207$).	55
Table 10 Gender differences in hardiness ($n=207$)	57
Table 11 Association between Age and Cognitive Hardiness ($n=207$).	58
Table 12 Perceived socioeconomic difference in hardiness ($n=207$).	58

LIST OF APPENDICES

Appendix A Approval from the Author of Cognitive Hardiness Scale	96
Appendix B Information Sheet	97
Appendix C Consent Form	99
Appendix D Information Sheet	100
Appendix E Cognitive Hardiness Scale-Urdu Version	102
Appendix F Cognitive Hardiness Scale-English Version	106
Appendix G Hospital Anxiety and Depression Scale	110
Appendix H Expert Opinion	111
Appendix I List of Changes	116
Appendix J Approval Letter	118

LIST OF ABBREVIATIONS

3Cs	Commitment , Control and Challenge
AHS	Academic Hardiness Scale
APA	American Psychological Association
BDI	Beck Depression Inventory
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CHS	Cognitive Hardiness Scale
CUST	Capital University of Science and Technology
DASS	Depression, Anxiety And Stress Scale
DRS	Dispositional Resilience Scale
EFA	Exploratory Factor Analysis
FHI	Family Hardiness Index
GHQ-28	The General Health Questionnaire
HADS	Hospital Anxiety and Depression Scale
HADS-A	Hospital Anxiety and Depression Scale – Anxiety Subscale
HADS-D	Hospital Anxiety and Depression Scale- Depression Subscale
HRHS	Health-Related Hardiness Scale
HSC	Hardiness Scale for Children
KDRS-15	Korean Dispositional Resilience Scale-15
KPK	Khyber PakhtunKhwa
K-S test	Kolmogorov- Smirnov Test
MLR	Robust Maximum Likelihood Estimation
OHQ	Occupational Hardiness Questionnaire
PVS-II	Personal View Survey- II
PVS-III	Personal View Survey- III
PVS-III-r	Personal View Survey- III- Revised
RAHS	Revised Academic Hardiness Scale
RMSEA	Root Mean Square Error of Approximation
SAT-score	Sum of Two Sections Score
SCL-90	Symptom Checklist-90
SPSS-21	Statistical Package for the Social Sciences - 21
STAI	State Trait Anxiety Inventory

LIST OF SYMBOLS

χ^2	Chi square value
n	Total number
M	Mean
MD	Median
SD	Standard deviation
p	Significance value
r	Spearman correlation coefficient / effect size
a	Cronbach alpha value
U	Mann Whitney U statistics
z	Z score in Mann Whitney U test
H	Kruskal Wallis H statistic

Chapter 1

Introduction

Hardiness is considered a personality characteristic comprising of attitude and beliefs supportive for positive outcomes of negative life circumstances and events (Nowack, 2021). Hardiness construct is a blend of commitment, control and challenge (3Cs) that motivates a person to remain steadfast and strategic in times of life difficulties and stressful situations (Maddi, 2002). The phenomenon of hardiness has been derived from the existentialist belief that people are open-minded, flexible, and capable of a variety of experiences. They look for meaning and purpose in life (Lambert & Lambert, 1987). Based on existential theory, Kobasa and colleagues (1979) stated that if individual experience a negative events and receive support and approval from others for exercising cognitive abilities, and being independent and determined in those experiences, they develop a hardy personality. As these life experiences develop a belief in people that it is worthwhile to be engaged in life activities, have an influence on one's environment, and grow with change.

Kobasa and colleagues (1979) postulated that these beliefs are the foundation of a hardiness personality which acts as a powerful stress-illness buffer. The study reported that some people remain determined in stressful conditions while others are affected adversely in the face of difficulty (Kobasa et al., 1979). The results led to the formation of another personality trait named hardiness to define the difference between these people. Hardiness is defined as an amalgam of 3Cs which includes Commitment, Control, and Challenge (Nowack, 1990; Maddi, 2009; Nowack, 2021). Together, these elements form a person's personality style which is a combination of beliefs, cognitive

appraisal, emotions, and actions that are aimed to have an enriched life through proactively engaging in everyday tasks, personal growth, and development.

Components of Hardiness

Among the 3Cs, the first component, commitment produces a strong sense of obligation, belonging, and connection towards society feelings of excitement, and motivation to remain engaged with friends, family, work, and the environment in a meaningful way during difficult times (Kobasa, 1982, Kobasa, 1985). People with high commitment level have deep involvement in life activities (Nowack, 2021). They have a strong sense of purpose in life which shields them from feeling alienated in times of stressful situations. These people easily identify with others around them hence, remain determined, and actively confront crises. They remain healthier under pressure than those who are dispirited (Kobasa, Maddi, & Puccetti, 1982)

The second component, control refers to a strong belief in personal control over experiences and events one encounters in life (Nowack, 2021). These people have a self-perceived belief that they can influence the outcomes of a stressful or difficult situation. Persons high in control see life circumstances and consequences within individual control. These people do not feel overwhelmed or helpless in times of stressors but rather positively appraise the situation and are determined that they possess the ability to change situations in their favor and modify the stressors (Carston & Gardner, 2009).

The third component, challenge refers to seeing difficult circumstances, life challenges, and changes as opportunities for growth and development (Nowack, 1990). The changes in life are accepted and viewed as opportunities to learn (Carston & Gardner, 2009). People who are high in the sense of challenge seek out change and new

interesting experiences in life. They thoroughly explore their environment and are motivated to respond to what new things life has to offer. To them, change is an opening to personal growth rather than a threat (Eid et al., 2008; Eschleman et al., 2010). They know how to access resources and use them in coping with stress (Kobasa, 1979).

To sum up, a person who possesses a hardy personality has sense of purpose and meaning in life, stays connected to others and life activities, perceives oneself as having control over life events, seeks opportunities, and considers change as a source of personal growth.

Based on Kobasa's findings, hardiness is a multidimensional concept that seems to be a desirable trait and thus should be measured in an accurate and reliable manner. Considering Pakistan, there is a dearth of studies that measured the psychometric properties of hardiness scales in Pakistan (Hosseini et al., 2022). Hence, the aim of the study is to assess the psychometric properties of the Urdu version of the Cognitive Hardiness Scale in the Pakistani context.

Keeping in view the goal of the study, the next section presents the narrative of the empirical literature present on hardiness.

Literature Review

Over time, researchers assessed hardiness in different contexts and communities with diverse populations and reported different definitions and dimensions of hardiness. For example, in 2005, Maddi proposed the 4th C of hardiness, connection, stating that communication with other members of society helps a person to gain strength and stay determined in the face of stressful circumstances. Whereas in 2017, Mund proposed the 5th C of hardiness, culture. According to Mund, hardiness should not be interpreted without cultural

consideration because the environment a person lives in influences a person's cognition and the way they deal with life stressors. But these findings were population and environment specific. However, to date, hardiness is assessed in terms of the 3Cs conceptualized by Kobasa in 1979 (Hosseini, 2022). Consequently, considering the multifaceted construct of hardiness it is acknowledged that various factors including culture, social norms and individual characteristics influence hardiness.

Other than that, there is always a debate whether hardiness remains stable overtime or can be increased through training (Maddi et al., 2006; Tugade et al., 2004). Various studies conducted in the past suggest that hardiness develops early in life as an attitudinal style or worldview and remains stable over time (Bartone, 2006; Maddi et al., 2006; Maddi & Kobasa, 1984). At the same time there are also studies available that suggest that hardiness can be taught to people to enhance their ability to deal with difficulties and stresses. This further stresses the importance of cognitive hardiness. Thus, hardiness has been assessed in association with various constructs such as performance, problem-solving, well-being, increased self-efficacy and lower psychological issues using different instruments (Hosseneni et al., 2022; Bartone et al., 2022, Yagan & Kaya, 2021; Anjum, 2022). The details of these studies are discussed in the later paragraphs.

Importance of Hardiness

A plethora of research on hardiness show that hardiness is significantly related to different constructs. In line with Kobasa's (1979) findings, Hystad & Johnsen (2019) also reported that hardiness function as a buffer between any stressor from the environment and its physical and psychological effects. The study also reported

hardiness aid in managing stress by positively appraising the stressor and showing a positive behavioral response.

Ward and colleagues (2018) in their study on the relationship between mental toughness and stress perceived by police officers reported that the hardiness trait is related to mental toughness construct. Janssens and colleagues (2021) found resilience to be related to hardiness. This again emphasizes the importance of hardiness.

Recently, a study conducted on the link between hardiness and psychological issues people faced during the days of Covid-19 pandemic found that hardiness moderated the effect of stress on depression and anxiety. The study reported that those with high hardiness showed less anxiety and depression (Bartone et al., 2022). Another study investigated the relationship between Spiritual health, hardiness, and burnout with 307 subjects from Tehran found that as the hardiness increases, spiritual health also increases. Furthermore, as the hardiness increases burnout and symptoms of illness decrease (Hosseini, Hesam, & Hosseini, 2022). Yagan & Kaya study (2021), recently, reported that individuals who have hardy personality possess cognitive flexibility hence, they are better at dealing with life issues.

Many studies on cognitive hardiness have also significantly associated hardiness with better performance, problem-solving, well-being, increased self-efficacy and self-esteem, happiness, and other health-related outcomes among different groups such as military personnel, college, university or school students, athletes, employees including managers as well as workers (Bartone & Bowles, 2020; Maddi et al., 2009; Nowack, 2007; Kobasa et al., 1892; Sharply & Yardley, 1999; Sharply et al., 2010; Nowack, 2021). Hence, on the basis of previous research, it can be deduced that

hardiness is demonstrated to have a positive influence on mental health (Hystad & Johnsen, 2019; Bartone & Bowles, 2020; Nowack, 2021).

Gender and Hardiness

Keeping into consideration the comprehensive research on hardiness, the existing literature shows variance in findings on gender differences in hardiness. Some studies suggest that there is no difference in the way men and women express and experience hardiness (Bartone et al., 2022) whereas there are also certain studies favoring men, suggesting that males are harder than females. (Kaur & Sood, 2010; Desai, 2017; Moradi, 2010; Veisi et al, 2001, Khorrami, 2007; Wang & Miao, 2007), whereas others favor females to have higher hardiness than their male counterpart (Sheard, 2009; Hannah & Morrisey, 1986).

Later studies have proposed that gender differences in hardiness may be related to various other factors such as difference in cognitive appraisal, life experiences, occupational demands, distinct personality traits, cultural influence, socialization, and gender roles. Therefore, when examining gender differences, these factors must be considered as these factors within gender may have more profound effect than gender in the average difference observed (Frank, Nixdorf & Beckers, 2014; Haktanir & Bakir, 2012; Gillham et al., 2012; Gillespie, Chaboyer & Wallis, 2009).

Age and Hardiness

In terms of age, literature highlights that individuals from differing age groups vary in their life experiences, perceptions and coping techniques they used to stay steadfast in the face of adversity (Bartone, 2007). These differences can influence the development of hardiness and its manifestation in individuals. Studies on intergenerational relationship and generational differences provide insight into impact

of age difference on hardiness, indicating that hardiness increase with age. Older people tend to exhibit higher level of hardiness (Martin et al., 2012; Ahadi, Bujang, & Juhari, 2016). While those who socialize with people of different age group may expose themselves to new challenges, thus, fostering hardiness (Bolldero & Gallagher, 2010; Langford et al., 2017). In addition, studies on life experiences suggest that life experiences have a potential influence on the development of hardiness. Hence, older individual are hardier than young generation as they draw on their wisdom and accumulated life experiences to deal with stressors life throw at them (Polenick et al., 2017).

Nevertheless, there are also certain studies present in the literature showing variance in findings. As studies by Harrisson and colleague (2002), and Shread (2009) suggested no difference in hardiness with respect to age difference, indicating that possibly individual characteristics like personality trait and life experiences have more profound influence on hardiness than age.

Socioeconomic and Hardiness

With regards to socioeconomic status, that encompasses various factors such as income, education and occupation basically reflect the social standing of the person. The research on difference in socioeconomic status and hardiness shows mixed findings. Several studies suggest that people from higher economic status exhibit higher level of hardiness. Studies highlight various reasons for such findings including greater access to resources, better opportunities, more facilities available for personal development and sense of control and resilience in life (Ahadi, Bujang, & Juhari, 2016; Beasley & Thompson, 2019). However, Conger and Donnellan (2007) highlighted different findings indicating that individuals from lower back ground possess more

hardiness, strength and adaptive coping mechanism to deal with challenges associated with socioeconomic circumstances. Adding to inconsistency in the findings with respect to SES several researches suggest no significant difference in hardiness among people from different income groups (Fergus, Zimmerman, & Weiner, 2011; Kim & Park, 2016; Hu, Zhang, & Wang, 2018). These studies highlight personal characteristics, social norms and individual experiences to influence hardiness of a person more regardless of their socioeconomic circumstances.

All in all, literature shows mixed findings regarding hardiness with respect to demographic characteristics that is gender, age and socioeconomic status.

Hardiness in Pakistan

The extant literature on hardiness in Pakistan also indicate importance of hardiness for Pakistani population. These findings are consistent with past researches signifying that hardiness has a stress-reducing effect (Kobasa et al, 1979; Hystad & Johnsen, 2019). For instance, more hardy individuals experience less level of stress (Jamal & Farooqi, 2015). Usually, the research conducted in Pakistan on hardiness focused on employees or students belonging to different domains (Jamal et al., 2017; Abid et al., 2019; Tara & Ahsan, 2020; Anjum, 2022). These studies also revealed that cognitive hardiness is significantly associated with psychological illness and significantly predicts health outcomes, performance, and stress.

In addition, empirical findings revealed that hardiness present among Pakistani population had a positive influence on the well-being and coping of an individual in stressful circumstances (Anjum, 2022; Khan & Chughtai, 2022). For instance, Jamal (2017) conducted research on rescue workers and investigated the relationship between hardiness and cognitive strategies as predictors of stress. The study reported that

hardiness could significantly reduce the adverse effects of stress (Jamal, 2017). Similarly, in 2022, Khan and Chughtai assessed the role of workaholism and psychological hardiness in affecting empowering leadership and occupational stress in Pakistani nurses. The study found that psychological hardiness plays a significant role as a moderator in the association between occupational burnout and workaholism. The study further demonstrated that nurses with high hardiness level coped well with stress caused by workload (Khan & Chughtai, 2022). Another study in 2022 investigated the moderating role of cognitive hardiness in the relationship between generalized workplace harassment and anger issues among working females (Tara & Ahsan, 2020). Tara and Ahsan (2020) reported that cognitive hardiness significantly moderated the relationship between the two indicating that females who had less cognitive hardiness become angrier when encountered generalized workplace harassment.

It is also argued that individuals with high hardiness have high academic success chances. For example, a study conducted on Pakistani university students showed a positive relationship between academic hardiness and academic success. Those students who appraise the stresses and challenges the educational life put on them as a source of growth have higher chances of academic success (Gul & Hyder, 2020).

Generally, studies on hardiness focused on the presence of hardiness among one gender. The few studies that examined hardiness in both males and females, however, reported no significant difference between the two with respect to extent of hardiness present among them (Shahid, 2015; Gul & Hyder, 2020).

Hardiness Scales

Taking into consideration the importance of the construct, it is necessary to have valid and reliable tools to measure it. Many scales have been developed over the

decades to assess hardiness among different groups, settings, and under various circumstances (Hosseini et al., 2022). All these scales have been formulated on the concept of personality hardiness conceptualized by Kobasa in 1979 (Hamid et al., 2022). Some scales measure negative aspects (Composite Hardiness Score (Kobasa et al., 1982) and Abridged Hardiness Scale (Allred & Smith, 1989)) whereas some measure positive aspects (Cognitive Hardiness Scale (CHS) (Nowack, 1990), Psychological Hardiness Scale (PHS) (Younkin, 1992), and Occupational Hardiness Scale (Moreno & Jimenez, 2014). In addition, various scales have also been developed and validated to measure hardiness among specific segments including military, children, students, managers, and patients (Adler & Dolan, 2006; Benishek & Lopez, 2001; Bartone et al., 2011; Hosseini et al., 2021; Pollock, 1986; Soheili, 2021).

Numerous studies have been conducted in the past to examine the psychometric properties of various hardiness scales among different populations, cultures, and settings (Hosseini et al., 2022). A systematic review conducted in 2022, provides a list of hardiness scales whose psychometric properties have been investigated in different studies (Hosseini et al., 2022). There is a dearth of studies that measured the psychometric properties of hardiness scales in Pakistan (Hosseini et al., 2022). Although, the literature suggests that the instrument must be translated in the national language of the country and the indigenization of any psychological instrument or content needs to be supported by its psychometric properties (Maneesriwongul et al., 2004; Khan & Batool, 2013). Therefore, in order to fill this research gap, the goal of the present study is to develop the psychometric properties of Urdu version of Cognitive Hardiness Scale (CHS) (Nowack, 1990) in Pakistani context. CHS is a 30-item scale comprised of items related to commitment, control, and challenge. High score on the scale indicates resilient outlook towards life stresses. The scale has been translated in

Urdu language using Brislin's back-translation method in 2015 (Haqqani & Zafar, 2015). Based on errors found in translation the scale was revised in the present study. However, its psychometric properties are not assessed yet.

As mentioned earlier, that various studies were conducted to establish the psychometric properties of these scales in different cultures and populations (Hosseini et al., 2022). Some of the prominent work in this domain include studies on the psychometric properties of Dispositional Resilience Scale, Personal View Survey, Health Related Hardiness Scale, Family Hardiness Index, Occupational Hardiness Scale, and Cognitive Hardiness Scale. The findings of these studies are discussed below.

Dispositional Resilience Scale

Bartone et al (1989) developed Dispositional Resilience Scale (DRS), a 45 item scale including positively and negatively stated items to measure the 3Cs. Most popularly used version is 15-item short version of DRS also called the short hardiness scale (Batool & Khan, 2020).

Studies on cross-cultural validation of DRS-15 revealed that the scale yielded internal consistency ranging from .61 to .87. The test-retest reliability ranged from .80 to .82. In addition, there was extensive data on validity of the scale in regards to its positive relation with psychological wellbeing, mental toughness and grit and negative relationship with anxiety and depression scales. (Hystad et al., 2010; Bartone et al., 2002; Hudek-knezevic & Kardum, 2008; Picardi et al., 2012; Sindik & Adzija, 2013; Solano & colleagues, 2016; Ko et al., 2018; Mohsenabadi & Fathi-Ashtiani, 2021). Further, various factor analytic studies supported three factor structure of the DRS

(Sinclair & Tetrick, 2000; Wong et al, 2014; Ko et al, 2018; Solano & colleagues; 2016).

Personal Views Survey

In the year 1985, Maddi and Kobasa developed another scale, a 50-item Personal Views Survey to measure the 3Cs of hardiness. The response was ranged from complete Disagreement (0) to complete agreement (4). The study found an alpha coefficient value of .88 for the scale. The validity of the scale was confirmed with the meaningful correlation of the scale with the Hopkins Symptom Checklist, Dependency Scale, and Ego Strength Scale.

Later, the 45-item Personal View Survey II (PVS-II) (Maddi, 1997) was introduced. The studies on factorial validity confirmed the presence of the 3 dimensions of the scale whereas reliability evidence of the PVS-II scale suggested .80 to .88 internal consistency for the total hardiness (Maddi, 1997; O'Neal, 1999).

Psychological Hardiness

Younkin and Betz, in 1996 developed another instrument called Psychological Hardiness. It had 40-items marked on a 5-point Likert scale. According to Younkin and Betz's study, the scale had .92 internal consistency. However, the validity evidence showed the scale correlated with CHS (.75). The study also correlated the scale with the Autonomy Scale (.43), Rosenberg's Self-Esteem Inventory (.56), and the Beck Depression Inventory (-.59). The criterion-related validity was also established in this study by examining the correlation of .64 with the Brief Symptom Inventory and .32 with the Life Stress Survey.

Health-Related Hardiness

In 1990, Pollack and Duffy developed a Health-Related Hardiness Scale (HRHS). The scale aimed to measure the impact of hardiness on people with actual health-related problems. The 34 items measure assessed participants on a Likert scale based on 6-points. The factor analytic studies conducted EFA and CFA and found a two-factor structure of the health-related hardiness construct (Commitment/Challenge and Control). The internal consistency ranged from .84-.91 for the total scale and for each subscale was .75-.87 (Pollock & Duffy, 1990; Dymecka et al., 2020), whereas Test-retest reliability coefficients ranged from .74 to .78 (Pollock & Duffy, 1990).

Family Hardiness Index

Families of individuals with chronic illnesses or other physical or psychological issues face significant stress. Therefore, to measure hardiness in such families, the Family Hardiness Index was introduced (McCubbin, Thompson, & McCubbin, 1987). The scale contained 20 items that were rated on 4-point Likert scale (False=0 to True=3). The studies that assessed psychometric properties of the scale indicated internal consistency of the scale to be between .79-.86. Several analytic studies provided support for three factor structure (3Cs) (Wiedebusch, McCubbin, & Muthny, 2007; Persson, Benzein, & Arestedt, 2016).

The validation studies estimated a good concurrent validity by showing a significant correlation with Self-Efficacy Scale (.38) and Resiliency Scale (.45). The criterion-related validity also yielded a significant correlation of FHI with the Quality-of-Life instrument (.50) (Wiedebusch, McCubbin, & Muthny, 2007).

Occupational Hardiness Scale

Occupational Hardiness Questionnaire (OHQ) consisted of a total of 15 items that measure occupation/work-related hardiness among people was developed by Moreno-Jimenez et al in 2014. It supported the three-factor structure of hardiness with Cronbach's alpha values for the challenge, commitment, and control dimensions as .78, .73, and .72, respectively, and for the entire scale .85 was reported. The test-retest correlations ranged from .43 (Commitment) to .54 (Control), indicating that OHQ dimensions were relatively stable. The study also established the validity evidence of the scale by correlating the hardiness dimensions and self-esteem thereby proving the scale to be valid (Moreno-Jimenez et al., 2014). The cross cultural validation studies also supported the three factor structure and good internal consistency of the scale (Balotanbegan et al, 2015; Caballero et al., 2016)

Cognitive Hardiness Scale

Last but not least, Nowack (1990) introduced another scale called Cognitive Hardiness Scale (CHS) comprising 30 items regarding work and life-related attitudes and beliefs embedded in three factors (3Cs) (Margret, 2001). It was rated on 5-point scale. The CHS was found to be a reliable scale with a good internal consistency of .84 (Nowack, 1990). The validity of the scale was established in various studies by its correlation with emotional exhaustion scale of job burnout (-.46), Health Habits Scale (-.47), Hassles scale (.33), psychological distress measure that was adapted from the Hopkins Symptom Checklist (-.46) (Derogatis et al., 1974), physical illness measure adapted from Greenberg (1981) (-.36) and Maslach Burnout inventory (-.50) (Nowack, 1990; Rowe, 1997). The reliability studies found CHS to be a reliable scale based on

internal consistency of .84 and test-retest reliability to be between .55-.95 (Schwartz et al., 1992; Nowack, 1990; Andrassy 1992; Green, Grant & Rynsaardt, 2007; Nowack & Greene, 2015).

To sum up, in order to assess the psychometric characteristics of the scale whether newly developed or translated the researchers relied on performing EFA, CFA, or both to assess the factor structure of the scale (Wang, 1999; Picardi et al., 2012; Moreno-Jimenez et al., 2014; Wong et al., 2014; Persson et al., 2016; Solano et al., 2016; Ko et al., 2018; Dymecka et al., 2020; Mohsenabadi & Fathi-Ashtiani, 2021).

In addition, most of the studies evaluated the internal consistency and test-retest reliability of the scale to assess its stability (Hosseini et al., 2022). Furthermore, to establish evidence for the validity of the scale many studies also assessed convergent and discriminant validity. There were also some studies that assessed the criterion-related validity (Picardi et al., 2012; Ko et al., 2018; Dymecka et al., 2020). This also demonstrate that establishing psychometric properties of a psychological instrument was always given prime importance (Hosseini, 2022).

Theoretical Framework

The theoretical framework of present study is based on Kobasa's theory of personality, also known as the "Hardiness Theory," was developed by Kobasa in 1979. The theory aims to explain individual differences in how people cope with stress and adversity, particularly in demanding and challenging situations. The core concept of Kobasa's theory is the construct of "hardiness," which refers to a set of personality traits and attitudes that influence an individual's ability to handle stress effectively (Kobasa, 1979). These traits include commitment, control and challenge. These dimensions are discussed in detail in the earlier paragraphs.

According to Kobasa's theory, individuals who possess high levels of hardiness are more resilient in the face of stressors. They are better equipped to cope with challenging circumstances, experience less negative psychological and physical effects of stress, and are more likely to adapt positively to adverse situations (Kobasa, 1979).

Over time researchers assessed hardiness in different contexts and communities with diverse populations and proposed various definitions and dimensions of hardiness (Hosseini et al., 2022). For example, in 2017, Mund proposed the another C of hardiness, culture. According to Mund, hardiness should not be interpreted without cultural consideration because the environment a person lives in influences a person's cognition and the way they deal with life stressors.

These findings are population and environment specific. To date, hardiness is mostly assessed in terms of the 3Cs conceptualized by Kobasa in 1979 (Hosseini, 2022). However, it is acknowledged that hardiness is multifaceted therefore, factors like culture can influence level of hardiness (Frank, Nixdorf & Beckers, 2014; Haktanir & Bakir, 2012; Gillham et al., 2012; Gillespie, Chaboyer & Wallis, 2009).

Rationale

Based on the existing literature and discussion of cultural context of Pakistan and current needs, this study is designed to evaluate the psychometric properties of a previously translated Cognitive Hardiness scale (Zafar & Haqqani, 2015) in Pakistan so that future studies can use a reliable and valid tool in the Urdu language to assess hardiness in Pakistani population.

Hardiness being a personality trait is also not only related to a person but to his/her environment (Chan, 2000; Benishek et al., 2005; Green et al., 2020). The reason lies under the prevailing social and cultural conditions that have the potential to affect

a person's perception and experience of difficult situations and stressors (Chan, 2000; Benishek et al., 2005; Green et al., 2020). Culture exhibits the way of life of a group of people, including their morals, traditions, custom, norms, habits, values, beliefs, and the emotional, intellectual, spiritual, and behavioral features of the society (Eshun & Gurung, 2009). People shape their culture in order to define and interpret the world around them. In return, culture also influences the strength of their personality (Markus, 2008; Matsumoto et al., 1996; Rohner, 1984). Hence, the local environment in which a person lives, learns, and grows shapes his/her cognition, view of the world, and personality through shared norms.

Similarly, social stressors are different across societies. Thereby, exposing a person to experience different stressful situations. These conditions significantly influence how they face the adverse situation, appraise stress, and cope with the stressors that come their way (Schweitzer & Ng, 2016).

Pakistan has different cultural conditions from other parts of the world. Pakistani people have their own unique culture embedded in their own historical experiences, socioeconomic structure, cultural, and societal stressors including economic burden, religious extremism, and political polarization (Munir et al., 2022). This meta environment shapes their personality and ways of dealing with stressors. Therefore, it is necessary to assess the extent of hardiness among Pakistani population. As, regardless of such circumstances, the literature suggests hardiness is still present among the Pakistani population (Abid et al., 2019; Jamal et al., 2017; Tara & Ahsan, 2020). Therefore, culturally valid tool is required to assess this construct in Pakistan.

In addition, Pakistan is home to 230 million people consisting 64% population under the age of 30 years (Pakistan Economic Survey, 2022). This young adult bulge

can be a dividend for the country since this young generation is the potential future workforce who can be employed in fully productive and rewarding activities and play a significant and active role in the nation's progress.

To be productive in life and excel, one should know how to deal with challenges and stressful life situations. As life comes with stresses which include both personal and professional stresses. These stresses, if not handled adequately can impose a negative effect on a person's performance, motivation, and health (Bonanno, 2004). Thereby, reducing the productivity of the person. Previous research suggests that hardiness could reduce the negative effect of stress (Monat et al., 2007; Polman & Nicholls, 2009; Rasouli, Hossenian & Dokanee, 2012; Jalali & Amarqan, 2015). Since hardy people translate stressful life events and work circumstances into opportunities for growth and development (Bartone, 2022). Therefore, it is vital to measure the extent of cognitive hardiness among the young generation who are the potential future workforce and capable of shaping tomorrow's status of the nation. In addition, as numerous studies suggest that level of hardiness differ among people with respect to age, gender and socioeconomic status. Therefore, exploring level of hardiness with regards to these factors in Pakistani context is also essential.

An accurate and valid scale in the national language of Pakistan is required with statistically robust psychometric properties to measure hardiness. (Maneesriwongul et al., 2004; Hosseni et al., 2022). Cognitive Hardiness Scale (CHS) has already been translated into Urdu language (Haqqani & Zafar, 2015). However, its psychometric properties are yet to be assessed. Thus, the aim of the current study is to evaluate the psychometric properties of this scale in Pakistani context.

Research Objectives

This study is aimed to;

1. confirm the factor structure of Cognitive Hardiness Scale in the Pakistani population
2. evaluate the reliability and convergent validity of the Cognitive Hardiness Scale
3. explore the variation in cognitive hardiness with reference to gender, age, and socioeconomic status.

Hypotheses

H-1: There is a negative relationship of Cognitive Hardiness Scale with Anxiety and Depression.

H-2: There is a significant difference in cognitive hardiness of male and female.

H-3: There is a significant association between cognitive hardiness and age.

H-4: There is a significant difference between cognitive hardiness and perceived socioeconomic status”

Chapter 2

Methodology

This section explains the research design, locale, ethical considerations, sample of the study, and instruments used in the study.

Study Design

A cross-sectional study was conducted to evaluate the psychometric properties of the “Cognitive Hardiness Scale” (Nowack, 1990) in Pakistan.

Phases of study

The study was conducted in 3 phases.

Phase 1

The first phase involved modification of urdu translation of Cognitive hardiness scale. The problems identified in urdu translation of various items were noted and the scale went through Brislin’s back translation method.

Phase 2

In the second phase cognitive interviews were conducted to assess the fesiability of the urdu translated version of Cognitive Hardiness Scale.

Phase 3

In the third phase of the study the scale was admistered on the target population and results were analyzed.

Locale

The current study’s data was obtained from university students of Rawalpindi and Islamabad.

Rawalpindi city is located in the north of Punjab province. It has an area of 1682 square kilometers. It is frequently known as Pindi to locals. Rawalpindi is the fourth largest city in Pakistan with a population of more than 3 million people (Macrotrends, 2022). Rawalpindi is present adjacent to the capital city, Islamabad. Both cities are often known as twin cities. A total of 96.8% of the population of the city is Muslim while the rest of the 3.2 % belong to other religions. The city constitutes 52.8% males and 47.2% females. The city's inhabitants speak various languages including Pushto, Urdu, and Punjabi.

According to the Pakistan Bureau of Statistics census (2017), the literacy rate of Rawalpindi is 82.45 percent of its total population. It is home to 17 public and private universities. The male literacy rate (88.02%) is higher than the female literacy rate (76.79%).

Islamabad is the capital city of Pakistan. The city covers a total area of 906.5 sq km. As of 2022, the population of Islamabad is more than 2 million with 53% male and 47% female (World Population Review, 2022). The population of the city includes 65% Punjabis, 14% Urdu speaking, 10% Pushtuns, and 11% others. Mostly the population of Islamabad is comprised of the 15-24 year age group which makes 57% of the population fall under the category of young adults. According to the World Population Review (2022), Islamabad has the country's highest literacy rate at 88%. The city has 16 recognized universities.

Ethical Consideration

Keeping in view the APA ethical guidelines, a written informed consent and information sheet was prepared (Appendix C). The information sheet was also given to the participants explaining the purpose of the study, the participant's role, and the risks

and benefits involved. The written informed consent was signed prior to participation in the study. The participants were notified that their participation was voluntary and they had the right to withdraw at any point. They were allowed to freely share their queries related to their participation in the study. The confidentiality of participants was assured by assigning codes to their names while analyzing the data.

Approval to conduct the study was taken from the Department of Psychology, Capital University of Science and Technology (CUST), Islamabad (Appendix J). Permission to use the scale was obtained from the concerned author of the scale before conducting the study (Appendix A).

Translation of the Cognitive Hardiness Scale

The Urdu-translated version of Cognitive Hardiness Scale (CHS) used in the study was translated using Brislin's back translation method (Zafar & Haqqani, 2015). However, while reexamining the scale in the present study some improvements were made in the Urdu translation of the statements (Appendix I). Thus, the scale went through all the stages of translation again as given in Brislin's back translation method. This method included the following steps;

Forward Translation

In order to modify the translation the scale two forward translations were conducted. Efforts were made to maintain the content and semantic equivalence of the items. In addition, the grammar rules of the Urdu language were followed. All the possible meanings of the difficult items were reviewed. Two Urdu-translated versions of the scale were generated and reviewed by the panel consisting of four members, two research assistants of department of Psychology, supervisor of the study, and researcher. The most accurate items from both translations were chosen and made part

of the final draft. Once all the changes were made, the draft was sent for back-translation.

Back-Translation

With an aim of back-translation, individuals with Master's degree were approached who were also fluent in both English and Urdu language. The finalized draft of Urdu translated version of the scale went through two back translations. Both translators were instructed not to use the dictionary for back-translation. In addition, no access to the original version of Cognitive Hardiness Scale was provided to the translators. Once both the individuals returned the back translated versions, they were reviewed and the most accurately translated items from both backward translations were selected.

However, the translation of three items did not match the intended meaning, for, (item9, item 24, item 19). Therefore, Urdu translation of these items were again reviewed but the translation seemed accurate which showed the possibility of subjective limitation at the end of back translators. Hence, Urdu translation of those three items were again sent for back translation to two other individuals who had proficiency in both English and Urdu languages. The most reliable translation of these items from both the back translations were retained.

Judgement of Equivalence

Once the final draft was formed, it was compared with the original version of the scale with an aim to keep only those items which maintain content and semantic equivalence. After ensuring the semantic and content equivalence of original and translated version, the scale entered cognitive interviewing phase.

Cognitive Interviews

In order to evaluate the understanding of the Urdu-translated version of Cognitive Hardiness Scale among the target population, Cognitive interviews were conducted with 10 University going students of age 18-26 years. All the respondents were selected through convenient sampling. The purpose of the cognitive interviews was to determine whether the sample understands the question in Urdu as the developer intended. In addition, an effort was made to identify the problematic questions and allow for questions to be modified and clarified. The respondents' feedback on the scale was also obtained regarding the difficulty faced by them while answering the questions.

Before the interview, respondents were briefed about the purpose of the interview and also provided with information sheet. A written consent was obtained from the respondents before beginning the interview. All items in the questionnaire were read aloud to respondents and they were asked to answer the questions and report if they find any statement or word hard to comprehend. Once the respondent provided an answer to a statement, they were asked to explain how they interpreted the statement to reach at a particular answer and restate the statement in their own words.

The items were read aloud to participants multiple times if they highlighted any difficulty in comprehending it. If they still were not able to understand it then, they were asked to state whatever they understood from the statement. It was observed that respondents were able to comprehend the meaning of the statements. Nevertheless, some respondents pointed out certain Urdu words as difficult to understand. The details of difficult words are given below;

1. Six of the respondent were unaware of the meaning of word 'muasar andaz (موثر انداز)

2. Eight respondents found the word ‘mansooba bandi’ (منصوبہ بندی) difficult to understand.

3. Five respondent stated that they were hearing the word ‘barah e rast’ (براہ راست) for the first time.

All those words identified as difficult were noted down and then, easy alternate words were searched for their replacement.

In the final version following changes were made; The word;

1. Muasar andaz (موثر انداز) was replaced with ‘waqai hi’ (واقعی ہی)
2. Mansooba bandi (منصوبہ بندی) was replaced with ‘plan’ (پلان)
3. Bara e rast (براہ راست) was replaced with ‘direct’ (ڈائریکٹ)

Once the refined version of the scale was formed and finalized it was used in the main study.

Population and Sample

The sample comprised of 414 young adults including both males and females. The sample size was chosen considering Krejcie and Morgan’s (1970) study which suggested that for a population of a million or greater a sample size of 384 or more was adequate. Similarly, Cochran (2006) also suggested using the same sample size for a population of a million or more. Both these studies utilized a statistical formula to provide sample sizes for various population sizes. For instance, $s = \frac{X^2NP(1-P)}{d^2(N-1)+X^2P(1-P)}$ (Krejcie & Morgan, 1970) and Cochran equation. The data was collected

from university students studying in Rawalpindi and Islamabad. For the purpose of selecting the participants, convenience sampling technique was used.

Inclusion Criteria

The following criteria was used for selecting the participants

- University students of age 18 years or above. .
- Students who gave written informed consent to participate in the study.

Exclusion Criteria

Those individuals who declined to participate were not included in the study.

Instruments

The data in the present study was obtained from young adults using the Urdu-translated versions of the Cognitive Hardiness Scale (Nowack, 1990) and Hospital Anxiety and Depression Scale by Zigmond & Snaith (1983). The demographic sheet was also formed to collect information about participants.

Demographic sheet

A demographic sheet was prepared for collecting data from the respondents. The sheet contained questions regarding their age, gender, education, program, number of siblings, birth order, mental or physical illness (current or past), socioeconomic status, city, religion, family structure, and marital status (Appendix D).

Cognitive Hardiness Scale (CHS)

Nowack's (1990) 30-item scale, a self reported measure, was used to measure cognitive hardiness among young adults. According to Nowack, this scale assessed attitudes and beliefs about work and life that were a reasonably stable part of everyday

life. The attitudes and beliefs included (1) Commitment, a sense of involvement toward everyday life events, family, hobbies, and activities which helped a person to seek belongingness with people and meaning in life. (2) Control referred to a belief of having control over life circumstances and that everything that happens in life were a result of one's own behavior rather than any external force. (3) Challenge referred to a belief that helped a person view everyday life changes as a source of personal growth rather than a threat.

A 5-point Likert scale is used to rate the items with 1= strongly agree and 5= strongly disagree. Items 1-6, 13-14, 16, 18-19, 22, 26, and 30 on the scale are reverse scored. The possible maximum score on the scale is 150 while the possible minimum score is 30. A higher score on the scale indicates that a person has a resilient outlook toward life circumstances. On the basis of the total score, cognitive hardiness is categorized into low (>89), moderate (89-124), and high (<124) (Nowack, 1990).

This scale is frequently used in previous research to measure hardiness among employees, health care professionals, retired individuals, alcoholics, students, and athletes, (Andrassy, 1992; Schwartz et al., 1992; Sharpley et al., 1995; Sharpley & Yardley, 1999; Noone, Dua, & Markham, 1999; Green, Grant & Rynsaardty, 2007; Carston & Gardner, 2009; Greene & Nowack, 2015; Nowack, 2021).

CHS has high internal consistency of .83 (Nowack,1990). Nowack (1990) also correlated the cognitive hardiness scale with the Health Habits Scale, stress measure of Hassles scale (Kanner et al.,1981), psychological distress measure adapted from the Hopkins symptom checklist (Derogatis et al., 1974), and physical illness measure adapted from Greenberg (1981). The analysis yielded a correlation of (.33), (-.46), (-.36), and (-.36) respectively (Nowack, 1990). Rowe (1997) also found a correlation

between the Cognitive Hardiness Scale and with Maslach Burnout Inventory to be .50. The test-retest reliability of the scale was found to be .95 (Schwartz, Nowack & Eichling, 1993).

CHS was effectively used in various previous studies yielding a reliability coefficient of .75 to .95 (Andarassay, 1992; Greene & Nowack, 1995; Green, Grant, & Rynsaardt, 2007 & Carston & Gardner, 2009). In the present study, the Urdu-translated version of CHS was used.

Hospital Anxiety and Depression Scale

Hospital Anxiety and Depression scale (HADS) (Zigmond & Snaith, 1983) assess depression and anxiety in both clinical and non-clinical populations. The scale contain 14 items. The seven questions measure depression while the other seven questions measure anxiety. All these questions related to anxiety and depression are spread within the scale. A 4-point Likert scale is used to rate each item (0= not at all and 3 = very often). Item 2,4,6,7, 12 and 14 on the scale are reverse-scored. The total score range from 0-21. On the basis of the total score range, a cut-off score is available for both anxiety and depression; a score of 8-10= mild, 11-14 = moderate and 15-21 = severe.

This scale yeilded good internal consistency of .70 for the total scale and .80 and .81 for both subscales (Zigmond & Snaith, 1983). The anxiety items had a specificity of .78 and a sensitivity of .9 whereas depression specificity and sensitivity were .79 and .83 respectively. In another study, Cronbach's value for the HADS anxiety subscale was .83 and for the HADS depression subscale was .77 (Lin & Pakpour, 2017).

This scale is translated into various languages including Iranian (Montazeri et al., 2003), Dutch (Spinhoven et al., 1997), and Chinese (Yang et al., 2014). The studies yielded a Cronbach's alpha value of .78, .75, and .79 for the HADS anxiety subscale respectively. For the HADS depression subscale Cronbach's alpha value of .86, .76, and .80 respectively.

The studies on validity showed a good correlation of HADS with GHQ-28, SCL-90, Spielberger's State-Trait Anxiety Inventory (STAI), and Beck's Depression Inventory (BDI) (Lisspers, Nygren, & Soderman, 1997; Chandarana, 1987; Watson et al., 1995). In the present study, the Urdu version of HADS by Mumford, Tareen, Bajwa, Bhatti, and Karim (1991) was used. This scale was used in previous studies generating Cronbach's alpha value of .68-.93 for the anxiety subscale and for the depression scale Cronbach's alpha value of .67-.90 (Bjelland, Dahl, Haug & Necklemann, 2002). Whereas another study yielded Cronbach's alpha values of .67 and .43 for the anxiety and depression subscale (Haqqani, 2017).

In the present study HADS (Mumford et al., 1991) was used in order to assess the correlation between CHS and HADS to develop evidence for the convergent validity of the Cognitive Hardiness Scale. Based on the theoretical relationship between hardiness and anxiety and depression (Bartone, 2021) which suggest that hardy individual are less likely to develop depression and anxiety, it was decided to use HADS to assess convergent validity of CHS. In addition, HADS is a widely used scale with sound psychometric properties as mentioned in the above paragraphs.

Main Study Procedure

The data was collected from university students of Islamabad and Rawalpindi city. A total of nine universities were approached including private and government universities. All the universities allowed to collect the data were thus included in the sample. Participation was voluntary. The data was gathered in group setting. The students were approached in their classrooms during university hours. Prior to participation in the study written informed consent was obtained from respondents. They were also informed about the purpose of the study. All the instructions were given in Urdu language (National language of Pakistan). Later, a set consisting of demographic sheet, CHS, and HADS was distributed. A total of 440 questionnaires were distributed out of which 26 contained 50% missing data. Thus, 414 questionnaire were made part of analyses.

Data Analyses

For the current study, data was entered, cleaned and analyzed using Software Package of Social Sciences-21 (SPSS-21). To begin with, scores on each scale were calculated for every participant. Subsequently, descriptive statistics including, maximum and minimum, mean, median, standard deviation, skewness, kurtosis, mode, frequency, and percentage were computed for scores and responses to the demographic sheet in order to assess the distribution and variance of the data. The normality of the data was also assessed using Kolmogorov-Smirnov (K-S).

The reliability evidence of the cognitive hardiness scale was established by computing Cronbach's alpha reliability. In order to assess the factor structure of the scale confirmatory factor analysis (CFA) was carried out.

The single-factor structure has been proposed in Cognitive Hardiness Scale (Nowack, 1990) based on Kobasa's theory of personality hardiness. This single-factor structure was assessed using fit indices such as value the root mean square error of approximation (RMSEA), and the comparative fit index (CFI). Based on results, later, EFA followed by CFA was conducted. Same fit indices were used to assess the model fitness of the factor structure obtained in EFA and later ratified in CFA.

The Root Mean Square Error of Approximation (RMSEA) (Steiger, 1990) value closer to zero indicates a better fit. The cut-off value of 0.01 shows an excellent fit, whereas 0.05 shows a good fit. If the value is closer or greater than 0.08, it indicates a poor fitting model (MacCallum, Browne, & Sugawara, 1996). The comparative Fit Index (CFI) (1990) ranges between 0 to 1 with a value closer to 1 denoting a good fit. CFI values equal to and above 0.9 indicates a good fit (Hu & Bentler, 1999).

Based on the results of EFA followed by CFA on 50% of the sample three new components of scale were formed. The validity of the scale with three new component was assessed. The validation process include the establishment of convergent validity evidence. To determine convergent validity, a correlation between the three components of Cognitive Hardiness Scale (CHS) and Hospital Anxiety and Depression Scale was computed. Bivariate Correlation was used to determine correlation. It was expected to have a negative correlation between them.

Lastly, in order to evaluate the characteristics of cognitive hardiness with respect to gender, age, and perceived socioeconomic status, Mann Whitney test, spearman rho and Krushkal Wallis test were also computed.

Chapter 3

Results

The present study was conducted with an aim to evaluate the psychometric properties of Urdu version of Cognitive Hardiness Scale in Pakistani context. The results of the study are presented in this chapter.

Sample Characteristics

In the current study, data was collected from 440 university students which include both males and females. However, 26 questionnaires were dropped due to having more than 50% missing values in it. A total data of 414 university students was made part of the final analysis. The table presented below provides the summary of demographic composition of the sample.

Table 1

Sociodemographic characteristics of sample (n=414).

Demographics	<i>n</i>	<i>%</i>
Age in years		
18-20	140	33.8
21-23	187	45.2
24-26	87	21
Gender		
Female	274	66.2
Male	140	33.8
Marital Status		
Single	320	77.3
In a relationship	22	5.3
Engaged	29	7
Married	43	10.4
Belong		
Punjab	375	90.6
Other	39	9.4
Religion		
Islam	413	99.8
Christianity	1	0.2

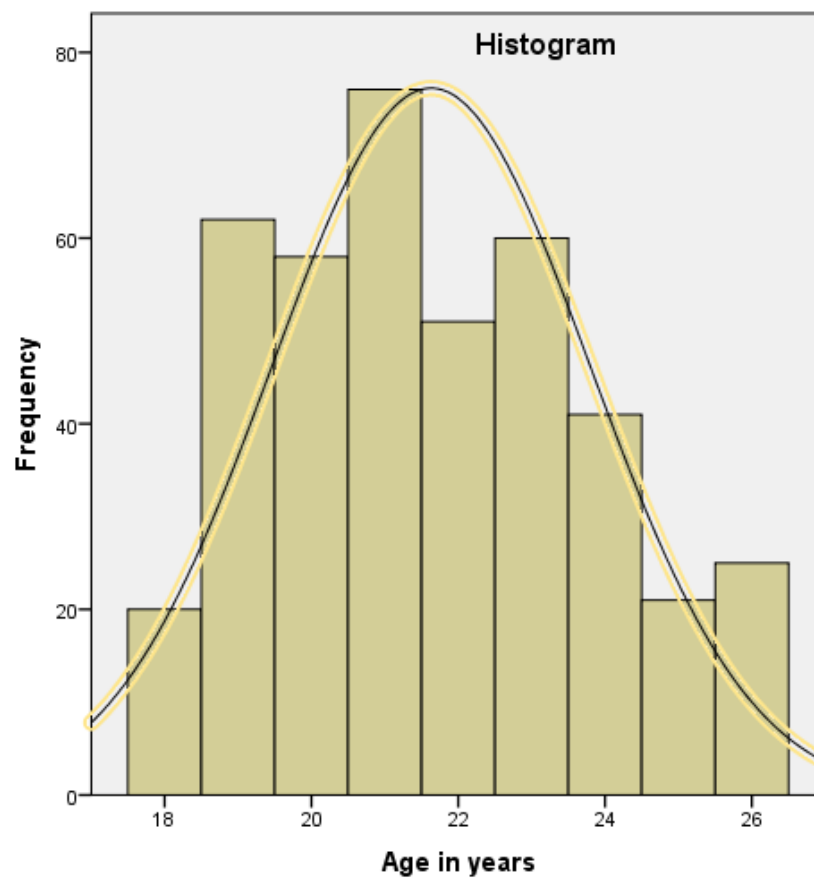
Education		
Bachelors'	262	63.3
Masters	76	18.4
MPhil	33	8
MBBS	44	10.6
Subject of Education		
Social sciences	22	5.3
Computer sciences	101	24.4
Economics	24	5.8
Medical	44	10.6
Business studies	223	53.9
Living with		
Parents and Siblings	341	82.4
Relatives	8	1.9
Others	65	15.7
Father/Guardian Work Status		
Self employed	125	30.2
Employee	230	55.6
Retired	45	10.9
Not working	14	3.4
Not applicable	7	1.7
Mother/Guardian Work Status		
House wife	341	82.4
Working women	73	17.6
Not applicable	28	6.8
Number of Siblings		
Only child	16	3.9
Two	69	16.7
Three	114	27.5
Four or more	215	51.9
Birth Order		
First born	138	33.3
Second born	70	16.9
Middle born	77	18.6
Last born	119	28.7
Only child	10	2.4
Everyday Need Fulfilment		
Pocket money	292	70.5
Part time job	111	26.8
Both	11	2.7
Income Group		
Lower	21	5.1
Middle	351	84.8
Higher	42	10.1
Head of the Family		
Father	336	81.2
Other	78	18.8

Head of the Family Education		
12 years of education or below	139	33.6
14 years of education	53	12.8
16 years of education or above	222	53.6
Head of the Family Work Status		
Self employed	124	30
Employee	238	57.5
Retired	34	8.2
Not working	18	4.3
Family Structure		
Joint	128	30.9
Nuclear	286	69.1
Diagnosed Health Issues		
No	322	77.8
Yes, previously diagnosed	72	17.4
Yes, recently diagnosed	20	4.8
Diagnosed Mental Health Issues		
No	387	93.5
Yes, previously diagnosed	22	5.3
Yes, recently diagnosed	5	1.2

Note: n=Total number, and % = percentages

The data ($n=414$) was obtained from both male and female participants. None of the participant marked on others option when choosing their gender. In terms of age, mostly participants were between the age range of 21-23 years ($n=187$, 45.2%). Among them ($n=129$, 68.9%) were females and ($n=58$, 31%) were males. The mean age was 21.6, median was 21 and mode was also 21 whereas standard deviation was .73. The variable of age was non normally distributed in the data set with .29 skewness and -.78 kurtosis ($K-S = .13$, $p < 0.05$). The distribution of age has been graphically represented below in the shape of following histogram.

Figure 1
Distribution of Age in years (n=414).



Mostly participants in the sample were single ($n=320, 77.3\%$). Out of which ($n=223, 69.6\%$) were females and ($n=89, 27.8\%$) were males. However, some participants reported to be in relationship ($n=22, 5.3\%$) which includes ($n=9, 40.9\%$) females and ($n=13, 59.1\%$) males. The engaged ($n=29, 7\%$) or married ($n=43, 10.4\%$) sample includes ($n=19, 65.5\%$) engaged females and ($n=10, 34.5\%$) engaged males and ($n=15, 34.8\%$) married females and ($n=28, 65.2\%$) married males. Those who reported to be married were usually among the age range of 24-26 years ($n=29, 67.4\%$), then, 21-23 years ($n=11, 25.6\%$) and only 6.9% ($n=3$) who were married belonged to the age range of 18 years-20 years.

Most of the participant in the sample were from Punjab ($n=375$, 90.6%) rest were from other areas such as Sindh, Balochistan, KPK, Kashmir and northern areas ($n=39$, 9.4).

In the data, mostly participants were doing bachelor's degree ($n=262$, 63.3%) among them ($n=180$, 68.7%) were females and ($n=82$, 31.3%) were male participants. The participants who reported to be doing bachelors were between the age range of 21–23 years ($n=142$, 54.2%) and 18-20 years ($n=102$, 38.9%). A higher number of participants were enrolled in business related studies ($n=223$, 53.9%) out of which ($n=140$, 62.7%) were females and males ($n=83$, 37.3%). Other than business studies mostly participants were studying computer sciences ($n=101$, 24.4%). This total constitutes a greater number of females ($n=67$, 66.3%) than males ($n=34$, 33.6%).

In the study sample, a greater number of participants were living with their parents and sibling ($n=341$, 82.4%) which includes ($n=230$, 67.4%) females out of a total of 274 females included in the sample and ($n=111$, 32.5%) males out of a total of 140 male participants made part of the study. However, a total of ($n=7$, 1.7%) participants reported their father to be dead and ($n=28$, 6.8%) mothers to be not alive. Only ($n=8$, 1.9%) reported of living with relatives. Among them 87.5% ($n=7$) were females and 12.5% ($n=1$) were male. Those participants who reported not to be living with family or relatives opted for others option ($n=65$, 15.7%). Among them, 56.9% ($n=37$) were females and 43.1% ($n=28$) were males. Mostly stated that they were living in hostel, with friend, with in-laws, husband, or alone.

Mostly participants belonged to nuclear family structure ($n= 286$, 69.1%). Among females a total of ($n= 200$, 70%) reported to be living in nuclear family whereas

among males ($n=86$, 30%) were part of nuclear family system. Those who reported to be part of joint family system were 57.8% ($n=74$) females and 42.25($n=54$) males.

Moreover, mostly participants were from middle income group ($n=251$, 84.8%). The mean of the income group was 2 (the middle income group), the median and mode were also 2, and the standard deviation was .387.

Other than that the data indicated that a greater number of female participants ($n=222$, 81%) were relying on pocket money to fulfill their everyday needs, only ($n=45$,16.4%) were doing part time job whereas there was a small fraction of females ($n=7$,2.5%) who were doing part time job as well as taking pocket money from the family to meet their daily needs. On the other hand, out of 140 males who were part of the study ($n=70$, 50%) were getting pocket money from their family, ($n= 66$,47.2%) were doing part time job whereas only ($n=4$, 2.8%) male participants were depended on both.

In addition to the above mentioned characteristics, it was also explored that usually head of the family were fathers ($n=336$, 81.2%) whereas the rest of the participants reported other member of the family to be head ($n=78$,10.1%) such as brother, mother, spouse, father in law, maternal/paternal grandparents, or paternal/maternal uncles. A cross tabulation between head of the family and family structure showed that 40.5% ($n=32$) who reported other family member to be head of the family were from joint family whereas 59.5% ($n=47$) were from nuclear family system.

In terms of health, usually participants reported no health issues ($n=322$, 77.8%) among them mostly belonged from middle income group ($n=276$, 85.7%). With respect to gender, ($n=214$, 66.4%) were females and ($n=108$, 33.5%) were males. Only some

participants reported to have been diagnosed with health issues either previously ($n=72$, 17.4%) or recently ($n=20$, 4.8%). A total of 60 (65.2%) females and 32 (34.7%) males reported of having diagnosis for health issues such as cancer, asthma, poor eyesight, blood pressure, diabetes, kidney stones, stomach problems, heart issues or appendix problem.

With regard to mental health, mostly participants reported no health issues ($n=387$, 93.5%) among them mostly belonged from middle income group ($n=327$, 84.5%). With respect to gender, ($n=253$, 65.4%) females and ($n=134$, 34.6%) males had no mental health issues. A total of 21 (77.7%) females and 6 (22.3%) males reported having diagnosis for mental health issues such as depression or anxiety.

Descriptive Statistics of Cognitive Hardiness Scale and Hospital Anxiety and Depression Scale

The following table presents the descriptive statistics of the scales used in the present study ($n=414$).

Table 2

Descriptive statistics of scales used in the study ($n=414$).

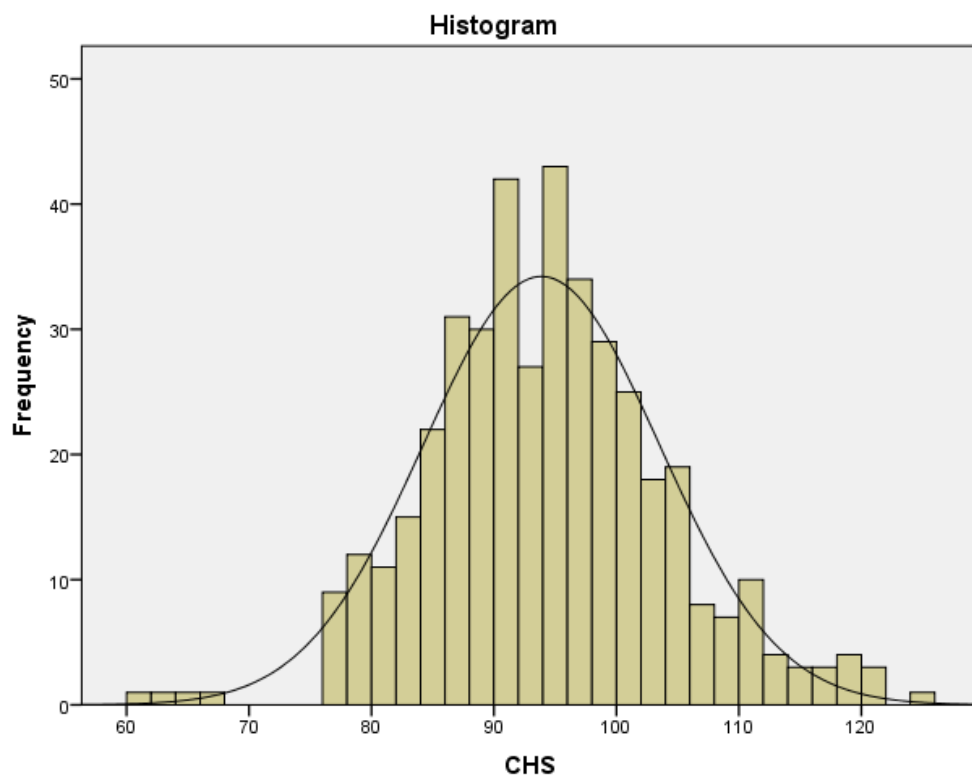
	<i>M</i>	<i>Md</i>	Mode	<i>SD</i>	Skewness	Kurtosis	K-S	<i>p</i>
CHS	93.8	94	90a	9.6	.19	.62	.05	.02
HADSA	9.82	10	12	4.2	-.09	-.68	.08	.00
HADSD	6.77	6.5	6	3.7	.33	-.36	.08	.00

Note: M= mean, SD= standard deviation, K-S= Kolmogorov-Smirnov test, CHS=cognitive hardiness, HADS=hospital anxiety and depression scale, a= multiple modes exist. The smallest value is shown.

Firstly, the sample had a moderate level of cognitive Hardiness, as indicated by the sample's mean score on the Cognitive Hardiness Scale (CHS) of 93.8 ($SD = 9.6$). The value of standard deviation indicated large variation was not observed in the data. The distribution appeared to be approximately symmetrically distributed, as indicated by the skewness value of .19. The kurtosis value of .62 indicated that distribution may be slightly leptokurtic. The Kolmogorov-Smirnov (K-S) test further confirms that the distribution was significantly different from a normal distribution (K-S= .05, $p < .05$). Below is a graphical representation of the distribution of scores on CHS in the form of a histogram.

Figure 2

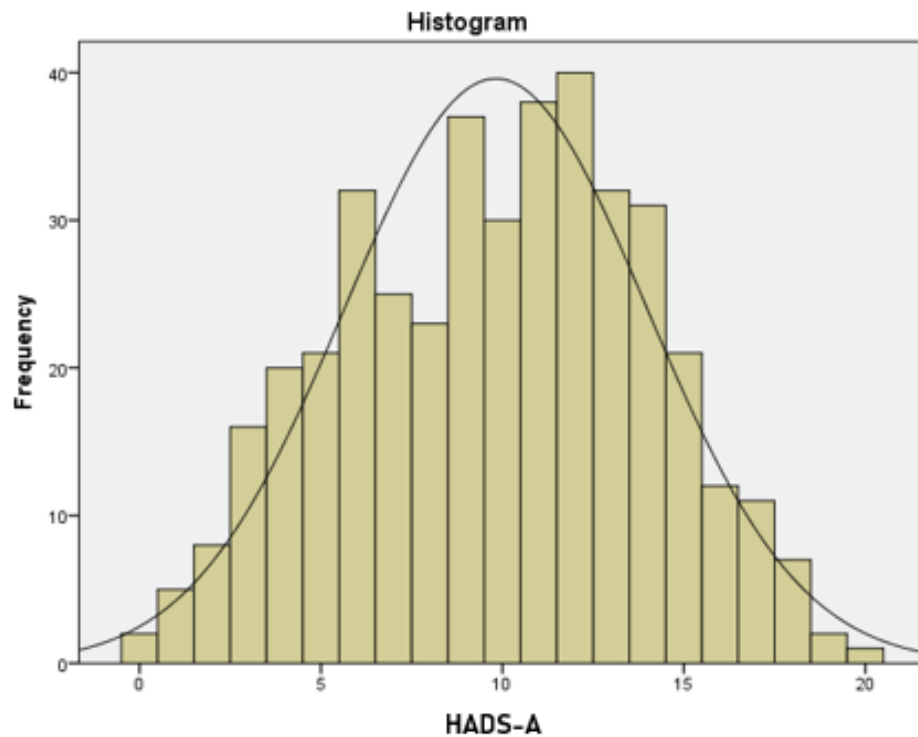
Distribution of scores on Cognitive Hardiness Scale (CHS) (n=414).



Secondly, HADS subscale of anxiety had a mean score of 9.8 ($SD=4.2$), indicating a moderate level of anxiety. HADS-A had a median of 10, and a mode of 12. The average variation in the scores were 4.2. The distribution appeared to be marginally left skewed based on the distribution's skewness value of $-.09$. The distribution seemed to be slightly platykurtic, as seen by the kurtosis value of $-.68$, which was negative. The K-S test statistic ($K-S=.00$, $p < 0.05$) indicated that the distribution was significantly different from a normal distribution. The graphical representation of the distribution of scores on HADS-A is given below in the form of a histogram.

Figure 3

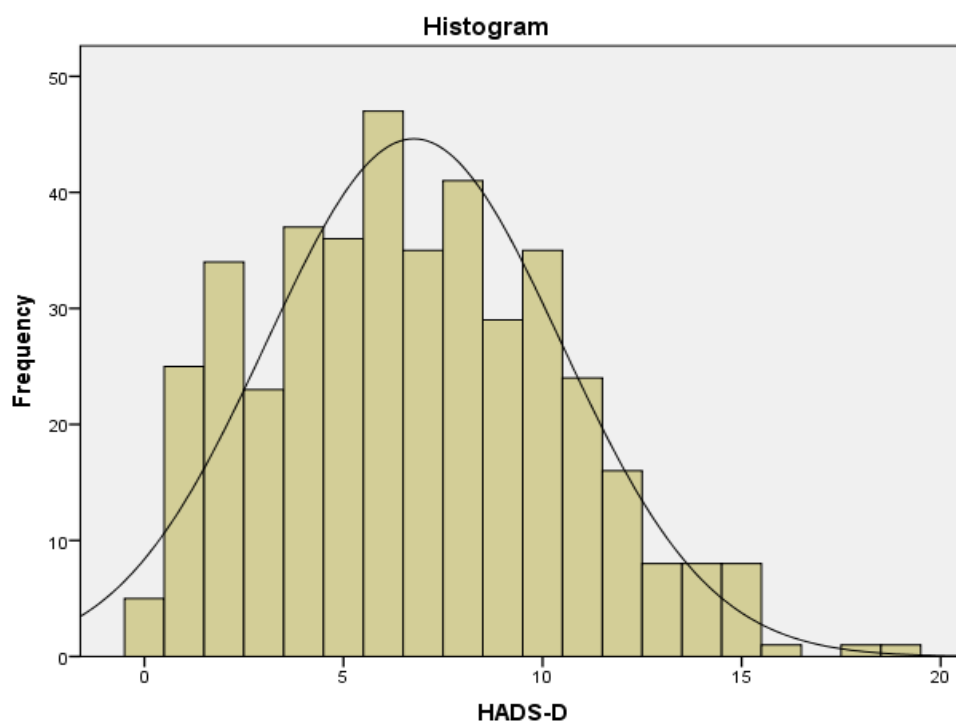
Distribution of scores on HADS anxiety subscale (n=414).



Whereas HADS subscale of depression had a mean score of 6.7 (SD=3.7), indicating a moderately low level of depression. HADS-D had a median of 6.5, a mode of 6 and standard deviation value of 3.7. The skewness value of .32 indicated distribution of data to be closer to symmetrical. However, distribution seemed to be marginally platykurtic, as seen by the kurtosis value of -.35. These values indicated data to be non-normally distributed which was further confirmed by the K-S test statistic (K-S=.00, $p < 0.05$). The graphical representation of the distribution of scores on HADS-D is given below in the form of a histogram.

Figure 4

Distribution of scores on HADS depression subscale (n=414).



Reliabilities of the Scales

The reliability of the scales was calculated in terms of internal consistency (Cronbach's alpha). The result of reliability analysis is given in the following table.

Table 3

Cronbach's alpha reliability with mean and standard deviations of the Cognitive Hardiness Scale and Hospital Anxiety and Depression Scale (n=414).

Scale	n	M	SD	Range		a
				Potential	Actual	
CHS	30	93.8	9.6	30-150	61-124	.61
HADS-A	7	9.8	4.2	0-21	0-20	.73
HADS-D	7	6.7	3.7	0-21	0-19	.65

Note: a = Cronbach's alpha, N= Number of Items, M = Mean SD = Standard Deviation, CHS = Cognitive Hardiness scale, HADS= Hospital Anxiety and Depression Scale, HADS-A = Hospital Anxiety and Depression Scale's Anxiety Subscale, HADS-D= = Hospital Anxiety and Depression Scale's Depression Subscale

The preceding table indicated that both the scales had internal consistency ranging from a value of (.61-.73). Considering George and Mallery (2003) criteria, Cognitive hardiness scale (CHS) had questionable internal consistency with Cronbach's $a = .61$ whereas Hospital Anxiety and Depression Scale (HADS) subscale that captures anxiety demonstrated Cronbach's alpha value of .73, suggesting acceptable internal consistency. On the other hand, depression subscale had a value of .65, also indicating marginal internal consistency (George & Mallery, 2003).

Factor analysis of CHS

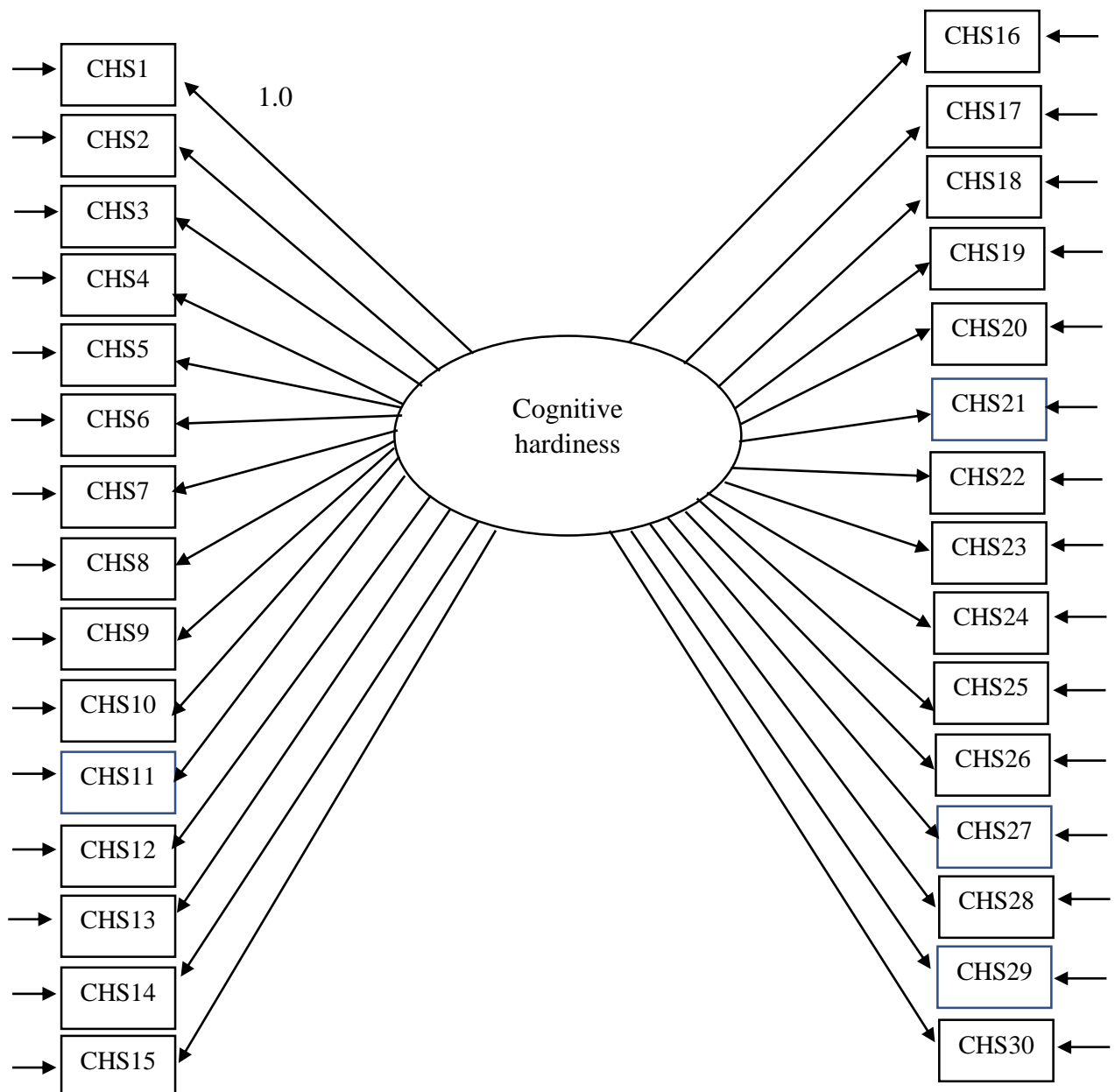
Cognitive Hardiness Scale (CHS) has single factor structure that is measured through 30 items. All the items are marked on 5-point Likert scale. In order to assess construct validity of the scale, CFA was performed. The hypothesized model for single factor was formed as shown in the figure 5. All the items measuring cognitive hardiness were loaded on single latent factor.

These indicators were fixed to load onto their hypothesized latent factor with zero loadings on the other factor, and their residuals were uncorrelated. The statistical significance of the factor loadings was evaluated using a threshold significance of .05. Any indicators that did not meet the criteria for statistical significance was eliminated from the final model. The amount of variance accounted for by each indicator (R^2) was also assessed. Before conducting CFA, normality of the data was assessed using Kolmogorov-Smirnov test statistics ($p > 0.05$) and assessing the histograms. The significant value of K-S test and shape of histogram suggested data to be non-normally distributed. Based on normality results, Robust Maximum likelihood estimation (MLR) was used to test for model fit, and following fit indices were used to assess it. The Bentler Comparative Fit Index (CFI) that ranged from 0 to 1 and compared the hypothesized model against the null model, with values equal to or above 0.9 indicating an equitable fit (Hu & Bentler, 1999). The Root Mean Square Error of Approximation (RMSEA) served as an index for model fit and had cutoff values of .01 for excellent fit, 0.05 for good fit, and 0.08 for mediocre fit (MacCallum, Browne, & Sugawara, 1996). The chi-square value is reported to be sensitive to sample size and distribution (Bollen, 2014), therefore, other fit indices were considered. Changes were made in the model based on theory, modification indices, and factor loadings in case the model did not

satisfy the above mentioned requirements or if modification indices suggested plausible revisions.

Figure 5

Hypothesized factor structure diagram of CHS.



The current study utilized a first-order confirmatory factor analysis to test the hypothesized single factor model of cognitive hardiness.

Results of Hypothesized Model

The results of the first-order CFA produced a poor model-fit with CFI=.55, and RMSEA =.06 (CI=.05-.06), all failing to meet the threshold values which indicate poor fit. There were various observed variables which were not contributing to confirm the model fit. They had lower, non-significant or negative standardized regression weights. These variables include item1-item6, item10, item13 item16, item18-item19, item22, and item30. This indicated removal of half of the items from the scale in order to improve the model which could have led to the loss of large number of items. Thus, the scale was sent to experts including six people having Masters degree or PhD. in the field of psychology and two research assistants of the department of psychology. They were instructed to evaluate items based on 3 factors (Commitment, Control and Challenge) as proposed in theory and indicate on which factor each item falls in. Based on expert opinions it was deduced that people comprehend the items with respect to 3Cs. Therefore, it was decided to conduct EFA. Thus, for that purpose the data ($n=414$) was divided into two equal halves. One half was used to conduct EFA ($n=207$) and other half was used in CFA ($n=207$).

EFA analysis with 207 sample

In order to assess the factor structure of 30 item CHS, 3 analytic models were analyzed. The 1 factor model assumed that all items load on one general factor. The two factor model assumed structure of 2 independent factors whereas 3 factor model assumed a structure of 3 independent factors. All these models were run using oblique rotation (Geomin). The competing models were compared based on model fit indices such as comparative fit index(CFI), root mean square error of approximation (RMSEA), Akaike's information criterion (AIC) and Bayesian information criterion (BIC). The level of 0.9 or above for CFI, 0.5 or below for RMSEA indicate good fit of the model

(Byrne, 2002). Considering AIC, a lower value of AIC indicates a better fit of the model (Akaike, 1987). Similarly, lower value of BIC indicates better fit of the model (Schwarz, 1978). However, RMSEA is considered a better choice to understand nature of underlying factors in the data as BIC and AIC are sensitive to sample size (Preacher et al., 2013). The table 4 represent the comparison of model fit indices of the contrasted models.

Table 4

The indexes for the estimated models with 1-factor, 2-factor and 3-factor model (n=207).

Model	CFI	RMSEA	AIC	BIC
1 factor model	.49	.06 (CI=.05-.07)	18782	19082
2 factor model	.73	.05 (CI=.04-.06)	18620	19017
3 factor model	.79	.04 (CI=.03-.05)	18576	19066

Note: CFI= comparative fit index, RMSEA= root mean square error estimation, AIC= akaike's information criterion, BIC= bayesian information criterion

1-Factor model

The 1-factor model produced a poor model-fit with CFI=.49, RMSEA =.06 (CI=.05-.07), AIC value = 18782, and BIC = 19082. A lot of factor loadings were insignificant at 1 factor model. Therefore, 2-factor model was run.

2-Factor model

The 2-factor model produced a better model-fit in comparison to 1-factor model with CFI=.73, RMSEA =.05 (CI=.04-.06), AIC=18620 and BIC=19017 but still the values failed to reach the threshold set for the good model fit. Many observed variables that were insignificant at 1-factor model were now loading on 2- factor model.

3-Factor model

Considering the previous two factor models, the 3- factor model showed better model fit with CFI=.79, RMSEA =.04 (CI=.03-.05), AIC=18576 and BIC=19066. Numerous observed variables were loaded on the 3-factor model. In addition, keeping into consideration Kobasa's theoretical assumption of hardiness there were 3 components of hardiness including commitment, control and challenge. Thus, 3-factor model was considered for EFA using MLR. The names of the factors were given on the basis of content of the items comprising that factor. The results of 3-factor model indicated certain items were loading on more than one factor and some items had negative or insignificant loadings. Based on insight gained from EFA results, CFA was performed. The table presented below shows the results of EFA.

Table 5

Results from factor analysis of the Cognitive Hardiness Scale (n=207).

Item no	CHS items	Factor loading		
		1	2	3
Factor 1: Commitment				
1	My involvement in non-work activities and hobbies provides me with a sense of meaning and purpose. (R)	0.31	0.16	-0.12
3	When all else appears bleak, I can always turn to my family and friends for help and support. (R)	0.31*	0.18	-0.12
7	In general, I tend to be a bit critical, pessimistic, and cynical about most things in work and life.	0.33*	0.01	0.20
8	It would take very little change in my present circumstances at work to cause me to leave my present organization.	0.27*	-0.13	0.13
11	Most of life is wasted in meaningless activity.	0.54*	-0.40*	0.00
12	I often feel awkward, uncomfortable, or insecure interacting with others socially.	0.51*	-0.26*	0.15
13	I rarely find myself saying out loud or thinking I am not good enough or capable of accomplishing something. (R)	-0.36*	0.20	-0.03

14	I am committed to my job and work activities that I am currently involved in. (R)	0.51*	0.00	-0.34*
15	I tend to view most work and life changes, disappointments and setbacks as threatening, harmful and stressful rather than challenging.	0.50*	-0.01	0.12
20	Overall, most of the things I am involved in (e.g., work, community, social relationships) are not very stimulating, enjoyable, and rewarding.	0.53*	-0.10	-0.03
22	There is a direct relationship between how hard I work and the success and respect I will have. (R)	0.36*	0.12	-0.31
26	If anything else changes or goes wrong in my life right now, I feel that I might be able to effectively cope with it. (R)	0.29	0.24	0.12
Factor 2: Control				
2	By taking an active part in political and social affairs, people can strongly influence world events and politics. (R)	0.21	0.34*	0.11
4	I prefer to do things that are risky, exciting, and adventuresome rather than adhere to the same comfortable routine and lifestyle. (R)	0.019	0.36	0.101
5	Becoming a success is mostly a matter of working hard—luck plays little or no role. (R)	-0.09	0.21	0.02
6	There are relatively few areas about myself in which I feel insecure, highly self-conscious or lacking in confidence. (R)	0.12	0.13	-0.20
16	Just for variety's sake I often explore new and different routes to places that I travel to regularly (e.g., home, work). (R)	-0.02	0.28	0.22
17	Others will act according to their own self-interests no matter what I attempt to say or do to influence them.	0.09	-0.36*	0.10
18	If I get a chance to see how others have done something or get the opportunity to be taught what to do, I am confident that I can be successful at most anything. (R)	0.24	0.43*	-0.01
19	I expect some things to go wrong now and then but there is little doubt in my mind that I can effectively cope with just about anything that comes my way. (R)	0.02	0.48*	0.08
29	You cannot really trust that many people because most individuals are looking for ways to improve their welfare and happiness at your expense.	0.03	-0.38*	0.05
30	Most of the meaning in life comes from internal, rather than, external definitions of success, achievement, and self-satisfaction.	0.08	0.34*	0.02

Factor 3: Challenge				
9	I do not feel satisfied with my current involvement in the day-to-day activities and well-being of my family and friends.	0.10	-0.04	0.28
10	In general, I would prefer to have things well planned out in advance rather than deal with the unknown.	-0.40*	-0.09	0.37*
21	I am likely to get frustrated and upset if my plans do not unfold as I hoped, or if things do not happen the way I really want them to.	0.13	0.04	0.53*
23	I do not feel that I have accomplished much lately that is really important or meaningful with respect to my future goals and objectives in life.	0.15	0.07	0.43*
24	I often think I am inadequate, incompetent, or less important than others with whom I work and that I know.	0.30*	-0.02	0.32*
25	Many times, I feel that I have little or no control and influence over things that happen to me.	0.13	-0.03	0.49*
27	When change occurs at work or home, I often find myself thinking that the worst is going to happen.	0.01	0.27	0.71*
28	At the moment, things at work and at home are predictable and any more changes would just be too much to handle.	-0.03	0.13	0.54*

*Note: bold represent highest factor loading, reversed score items are denoted with R, and * signifies significance at 5% level*

CFA analysis with 207 sample

CFA of the items using robust maximum likelihood estimator (MLR) was carried out with an aim to ratify the model obtained in exploratory factor analysis. CFA was carried out on the remaining half of the sample ($n=207$). The results indicated satisfactory model fit with CFI=.75, RMSEA =.04. The observed variables which were not contributing to confirm the model fit and had lower insignificant or negative standardized regression weights were dropped from the final model. These variables include item1, item3, item10, item13, item16, item17, and item22. The modification indices indicated further room for improvement. For instance, Item 14 showed cross loading on both factor 1 and factor 2. In addition, modification indices also indicated

that model would improve if factor 3 was measured by item 29 and factor 2 was measured by item 26. Thus, the indicated modifications were made in the model. The final model demonstrated a strong fit with the dataset, as indicated by statistical measures (CFI=.92 and RMSEA=.03 (CI=.01-.04)). The model fit validated construct validity by meeting the criteria of CFI as greater than .9 and RMSEA less than .05, indicating good fit. The final model included three latent variables and 23 indicators. The indicator represented by CHS29 had the lowest loading of .20($p<0.05$). The remaining indicators had loading ranging from .22 to .66. The latent factor 1 and 2 had weak correlation with each other ($r=.01$, $p>0.05$). The factor 1 however, had strong and significant correlation with factor 3 ($r=.79$, $p>0.05$). Lastly, factor 2 and factor 3 had negative and weak correlation ($r=-.12$, $p<0.05$). The R^2 statistics are presented in the table 7 given below. The diagrammatic representation of the final model along with factor loadings is presented below;

Figure 6

Final CHS model(n=207).

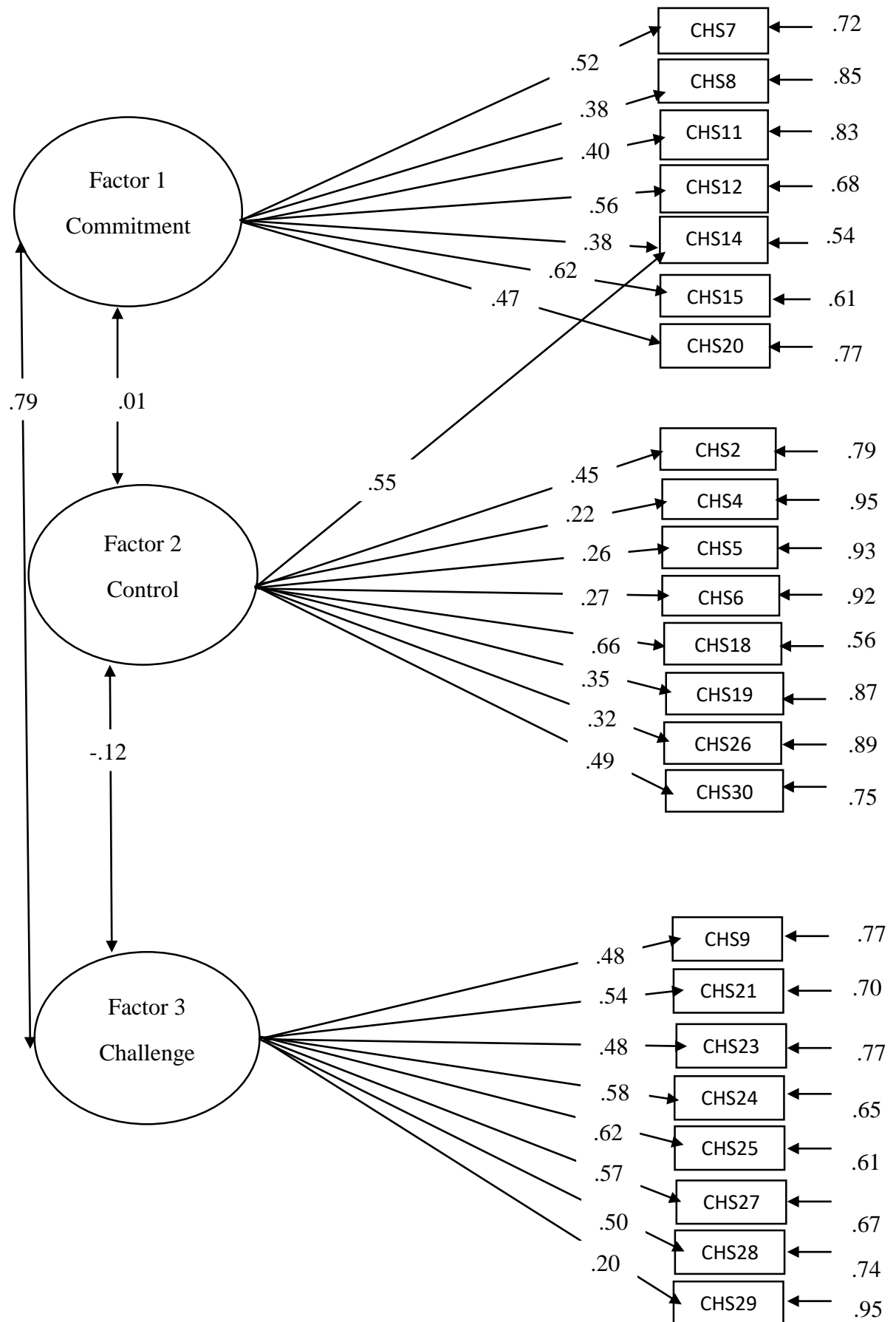


Table 6*Variance accounted for (R^2) by CHS items (n=207).*

Indicators	R^2	SE
CHS2	0.20**	0.07
CHS4	0.04	0.04
CHS5	0.06	0.04
CHS6	0.07	0.05
CHS7	0.27**	0.08
CHS8	0.14*	0.06
CHS9	0.22**	0.07
CHS11	0.16**	0.06
CHS12	0.32***	0.07
CHS14	0.46***	0.09
CHS15	0.38***	0.07
CHS18	0.43***	0.09
CHS19	0.12	0.08
CHS20	0.23***	0.07
CHS21	0.29***	0.06
CHS23	0.23**	0.08
CHS24	0.34***	0.07
CHS25	0.38***	0.07
CHS26	0.10	0.06
CHS27	0.32***	0.08
CHS28	0.25***	0.07
CHS29	0.04	0.04
CHS30	0.24***	0.09

*Note: * indicates significance level, R^2 = variance accounted for, SE= standard error*

Cronbach Alpha Reliability of the Final CHS Version

The reliability of the CHS subscales commitment, control, and challenge are presented in the table given below.

Table 7

Cronbach alpha reliability of the final CHS version along with mean, standard deviation, skewness and kurtosis value (n=207).

Scale	n	M	SD	Range		a	skewness	kurtosis
				Potential	Actual			
Factor 1 Commitment	7	21.8	4.7	7-35	11-35	.68	-.09	-.15
Factor 2 Control	8	29.6	4.5	8-40	9-39	.58	-.56	-1.4
Factor 3 Challenge	8	21.9	5.4	8-40	9-37	.72	.04	-.12

Note: n= number of items, M= mean, SD= standard deviation, a= Cronbach's alpha value

The reliability analysis indicated the subscales of CHS commitment and challenge had satisfactory internal consistency of .68 and .72 respectively. The control subscale had relatively weak internal consistency reliability as suggested by alpha value of .58.

Convergent Validity Analysis of CHS

Keeping in view non normal distribution of data as indicated by K-S test statistic ($p < 0.05$), non-parametric tests were used to do analyses. To assess the convergent validity spearman correlation between HADS and CHS was calculated.

Table 8

Correlation of the original CHS version with HADS subscales (n=414).

Scales	CHS	HADSA	HADSD
CHS	-		
HADSA	-.408**	-	
HADSD	-.467**	.458**	-

** indicate that correlation is significant at 0.01 level (1-tailed)

Table 9

Correlation of the scales after modification of CHS (n=207).

Scales	HADS-A	HADS-D	Commitment	Control	Challenge
HADS-A	-	.469**	-.417**	.006	-.404**
HADS-D		-	-.505**	.000	-.294**
Commitment			-	.035	.524**
Control				-	-.097
Challenge					-

** indicate that correlation is significant at 0.01 level (1-tailed)

Table 8 indicate that original CHS version was significantly negatively associated with anxiety ($r = -.408$, $p < 0.01$) and depression ($r = -.467$, $p < 0.01$), indicating that high cognitive hardiness was linked with low depression and anxiety.

Table 9 indicate that anxiety subscale of HADS had a significantly negative relation with commitment ($r = -.417$, $p < 0.01$) and challenge ($r = -.404$, $p < 0.01$) subscales of CHS. Similarly, depression subscale of HADS also had significant negative relationship with commitment ($r = -.505$, $p < 0.01$) and challenge ($r = -.294$, $p < 0.01$) subscales of CHS. The results indicated that those with high commitment towards work, family and self, and consider life changes as challenge have low anxiety and depression. Concerning control subscale, it had insignificant relationship with

anxiety ($r=.006, p>0.05$) and depression ($r=.000, p>0.05$). This indicated control to be independent of anxiety and depression. Based on negative relation between two of the subscales of CHS and anxiety and depression subscales of HADS, the CHS qualifies to have convergent validity.

Variation in Cognitive Hardiness Score with respect to Age, Gender and perceived socioeconomic Status

In order to assess the characteristics of cognitive hardiness with reference to age gender and perceived socioeconomic factor, Mann Whitney test, spearman correlation, and Kruskal Wallis test were computed on a sample of 207 participants.

There is a significant difference in cognitive hardiness of male and female.

Mann Whitney test was performed with an aim to evaluate the difference between male and female with respect to cognitive hardiness. The following table presents results of the hypothesis 2.

Table 10

Gender differences in hardiness (n=207).

Variable	Male (n=60)		Female (n=147)		U	z	η^2	p
	M	MD	M	MD				
CHS	115.6	72	99.2	71	3711.0	-1.7	.01	.07

Note: MD=median, M= mean, U=Mann Whitney U statistic, z= z score, η^2 =effect size, p=significance value (2 tailed), CHS=Cognitive Hardiness Scale

The results indicated that there was no significant difference in cognitive hardiness of male and female, $U=37711$, $p>0.05$. However, male group ($M=115.6$) had high mean rank as compared to females($M=99.2$). The size of the difference between the groups was very small as indicated by η^2 value (.01) which was calculated using the formula ($\eta^2=z^2/(n-1)$).

There is a significant association between cognitive hardiness and age.

In order to evaluate the association between age and cognitive hardiness Spearman rho was calculated. The results of analysis are given below in the form of table.

Table 11

Association between Age and Cognitive Hardiness (n=207).

Variables	CHS	Age
CHS	-	.202**
Age		-

*Note: CH= cognitive hardiness Scale, ** refers correlation is significant at 0.01 level (2-tailed)*

The results presented in the table 11 indicate that there exist significant positive but weak relation between age and cognitive hardiness ($r=.202, p<0.05$). Thus, results suggest that with increase in age hardiness level also increases. Hence, hypothesis 3 is proved.

There is a significant difference between cognitive hardiness and perceived socioeconomic status

Lastly, to assess the difference in cognitive hardiness with reference to perceived socioeconomic status Kruskal-Wallis test was used. The results of the following analysis are presented below in table 12.

Table 12

Perceived socioeconomic difference in hardiness (n=207).

Variable	Income group			<i>H</i>	χ^2	E^2_R	<i>p</i>
	<i>Lower</i>	<i>Middle</i>	<i>higher</i>				
CHS	96.3	104.6	103.5	.23	.23	.001	.89

Note: p= significance value, CHS= cognitive hardiness scale, χ^2 = chi square, E^2_R =Epsilon squared

With respect to income group, the Kruskal Wallis-Test also indicated no significant difference between the income groups on cognitive hardiness extent, $H(2) = .23, P > 0.05$). H statistics was calculated using the formula e.g $H = \frac{12}{N(N+1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(N+1)$, where N is for total number of sample, n refers to sample size of one group, R means sum of ranks for group, and k is the number of groups being compared. The size of the difference among groups was very small as indicated by epsilon squared value of ($E^2_R = .001$). The effect size was calculated using formula e.g $H/[n^2-1]/(n+1)$, where H indicates Kruskal-Wallis statistic value, and n refers to total number of observations. This indicated hypothesis 4 to be not supported by the findings of the present study.

Chapter 4

Discussion

In the present study, the psychometric properties of cognitive hardiness scale were assessed and the scale was modified keeping into consideration the results of the factor analyses. In addition, the internal consistency as well as the convergent validity of the scale was also examined. Further, in order to enhance the applicability of the research findings on larger population, detailed demographic characteristics were explored. Lastly, the extent of hardiness with respect to gender, age and perceived socioeconomic status was also assessed and discussed in this chapter.

The data was collected from 440 participants but due to more than 50% missing values 26 questionnaires were dropped. A total of 5.9% of the data was missing. The possible reason behind missing values in the data could be because people often hesitate to share their personal details in research settings due to concerns of confidentiality (Bartholomew et al., 2011). In addition, many times participants out of boredom leaves the questionnaire empty. These issues are quite common in research (Bartholomew et al., 2011).

Demographic characteristics

As mentioned earlier, detailed demographics were obtained to increase the generalizability of the results as well as provide contextual information of the sample as hardiness is a construct that is influenced by the circumstances a person in which he/she is living. In addition, the believes and values a person has it also influences hardiness. To begin with, data include higher representation of females than males. The possible reason behind this could be the sampling characteristics as disciplines from where the data was collected were female oriented such as medical and social sciences.

In addition, one of the university approached for data collection was purely female oriented. In addition, the data has higher representation of undergrad students. This could be attributed to the fact that universities were approached in the morning time for data collection and usually undergrad programs are run in the morning (Amin, 2016). Thus, the convenient sampling might have contributed to this composition of undergrad in the sample. With respect to discipline, mostly data is from business studies student (53.9%). This could be attributed to sampling characteristics. Often universities have requirement for a reference to enter a university for data collection. The reference used in this study to collect data might have contributed to such a large representation of business studies student in the sample. Another reason could be high rate of enrollment in business studies (Asad & Anwar, 2022).

In addition, none of the participant opted for “other” option when choosing gender. This reflects cultural and social norms, religious beliefs, and legal frameworks that prioritize the binary understanding of gender in Pakistan. People may not choose the "other" option in research studies in Pakistan due to various reasons, including social and cultural stigmas surrounding non-binary gender identities, fear of discrimination or harassment and social isolation. Furthermore, in Pakistan, gender is often tied to religious practices, where the majority of the population follows Islam. In Islamic teachings, gender is considered binary, with men and women occupying distinct and separate roles in society (Qasim & Siraj, 2017). As a result, many individuals may not feel comfortable identifying themselves as non-binary or gender-nonconforming in research studies.

With regards to marital status, mostly participants reported to be single a few of them claimed to be engaged or married. As the data is collected from young adults and in current trends in Pakistan mostly people at that age are usually pursuing study

therefore, less number of people are usually married or engaged. In recent years, there has been an increasing emphasis on education, particularly among women, and many young people are now prioritizing their studies over getting married at a young age (Sherwani & Mirza, 2015).

In case of males, young people, particularly males, may be delaying marriage until they have secured stable employment and financial stability. Additionally, many young people may be focused on building their careers and saving money, which can be challenging to do while also starting a family (Naseer et al., 2019). Additionally, some families may be hesitant to allow their children to marry at a young age, particularly if the family is struggling financially (Shahid & Bhatti, 2016)

However, only 5.3% individuals in the sample reported to be in relationship. This could be due to the fact that relationships and dating are often considered private matters and individuals may not feel comfortable sharing this information with others, especially in a formal research setting (Bartholomew et al., 2011).

Furthermore, there are social and cultural expectations regarding dating and relationships in Pakistan, particularly for unmarried individuals. The establishment of romantic ties before marriage is discouraged in Pakistani culture. In the case of females, Pakistani culture places a high value on preserving family honor, which is often equated with female modesty and chastity. Therefore, daughters are discouraged to engage in romantic relationship before marriage (Jabeen, 2019; Syed & Hussain, 2018). As a result, individuals may be hesitant to disclose their relationship status, especially if they feel that it could affect their social standing or reputation.

Considering religious affiliation, mostly people reported their religion to be Islam ($n=413$, 99.8%). Only one participant identified their religion to be Christianity

($n=1,0.2\%$). However, no participant identified themselves to Hinduism or any other religion. This could be because Pakistan is a Muslim majority country with 96.5% Muslim population whereas only 3.5% makes non-muslim population (World Population Review, 2023). Similarly, in the sample majority of people reported to belong to Punjab ($n=375, 90.6\%$) rest were from other areas such as Sindh, Balochistan, KPK, Kashmir and northern areas ($n=39, 9.4$). This is due to the fact that data is collected from only from local universities of Rawalpindi and Islamabad. This means that students from Punjab province may be more likely to apply to universities in these cities, as they are closer to their home and may be more familiar with the area.

With regards to family arrangements, mostly people have reported of living with their parents and siblings ($n=341, 82.45$). This indicate that the family structure in present-day Pakistan has shifted towards a predominantly nuclear family model. Even in the sample as well, people have showed their belongingness to nuclear family structure ($n=286, 69.1\%$). This could be because of the search for better opportunities, modernization, increasing cost of living, limited housing availability, and changing employment patterns that have contributed to smaller family units, with couples opting for nuclear families to maintain financial independence and manage household expenses (Roudi-Fahimi, 2011; Iqbal, 2018). In addition, for pursuing higher education and professional careers, many people shift to urban areas which can contribute to the preference for nuclear family structures (Khalid et al., 2014).

Further, mostly people have reported to have 3 or more siblings. This also tell us the family size preference in Pakistan. In the past, it was common to have large family including 6 or more children. In Pakistan, social standards have now changed, and people are now more accepting of smaller families. This is largely a result of the growing Western cultural impact, where smaller families are more prevalent (Khan &

Ahmed, 2017). Another reason could be raising cost of living which may have motivated people to have small family size to reduce financial constraints (Population council, 2019). Still, the family size has not shrunk to 2 children. This could be largely because of strong pressure from the families to have large family and it is difficult for couples to go against it (Khan & Ahmed, 2017).

Further, mostly participants have reported their mothers to be house wives and fathers to be working outside house. This also reflects the structure of the society where females are preferred to be stay-at-home mothers, while men should be the breadwinners (Amin & Mehmood 2017). Similarly, the head of the family in Pakistan is typically a male member of the family such as father, brother, grandparent or uncle as depicted in the results. This can be attributed to a combination of cultural, social, and historical factors. Firstly, Pakistani society has traditionally been structured around patriarchal norms, where men are assigned dominant roles in decision-making and family leadership (Ahmed et al, 2021). Secondly, the legal and religious frameworks in Pakistan also reinforce male authority within the family (Nawaz, 2021). Lastly, division of labor has contributed to the perception of men as the head of the family, as they often have a primary role in providing financial support and resources (Zaman & Shahid, 2023). All these factors reflect cultural set up of families in Pakistan.

Similarly, a greater number of sample (70.5%) has indicated their financial dependence on family. Most of them reported to be getting allowance from their families. This also reveals social structure and culture of Pakistan. Typically, in south Asian cultures, including Pakistan, people are raised to believe that family ties are most important. There is a strong emphasis on intergenerational support. It is common for parents to financially support their children well into adulthood (Awan, 2014). Due to these cultural norms children are expected to live with their parents until they are

married and stay financially dependent on them even after they reach adulthood. This support usually takes various forms such as provision of clothing, food, educational support, housing and pocket money for other expenses. Thus, due to this possible reason greater number of sample has reported to be financially dependent on pocket money from the family. However, may be due to individual variances or financial circumstances of the family some people reported to be relying on both job and allowance.

Keeping into consideration socioeconomic status. The sample indicated greater representation of middle income group ($n=351$, 84.8%). This could be attributed to the fact that the data in the study has been collected from local government and private universities in Rawalpindi and Islamabad. Usually people from middle income groups afford expenses of the local universities. As middle-income families generally have greater financial resources compared to low-income households. This enables them to afford the costs associated with higher education, including tuition fees, books, and other educational expenses (Jamal, 2016). In addition, middle-income families often prioritize investing in education as a means to enhance social mobility and secure better opportunities for their children (Tariq, 2014). They may also have access to private tutoring or educational support, which can enhance their academic performance and increase their chances of admission to universities (Khan & Shafique, 2018). On the other hand, families from lower income group do not afford the expenses of higher education. Above all, they prefer their kids to start earning as soon as possible to support the family. Whereas, in case of families from higher income group, they often have more resources and financial capabilities, therefore, they prefer to send their children abroad for higher education, or prefer professional or elite institutions (Hui & Khan, 2021).

Lastly, with respect to physical and mental health only some people reported any issue that they might be facing rest of sample reported no physical or mental health issue. The possible reason behind this composition of responses could be the fact that usually people do not prefer to share their personal details in the research setting (Bartholomew et al., 2011). Especially, people have concerns about privacy, anonymity and afraid that their identity maybe revealed if they share their personal experiences. These concerns are usually rooted in the fear of being labeled or treated indifferently (Ahem et al., 2006; Nandi & Das, 2014; Patel, Thornicroft, & Mehta, 2011). For those who have reported any physical or mental issue stated of having diagnosis for issues such as cancer, asthma, poor eyesight, blood pressure, diabetes, kidney stones, stomach problems, heart issues, appendix problem anxiety or depression. These are some of the most prevalent health issues present in Pakistan (WHO, 2022).

All in all, these characteristics have the potential to influence hardiness. For instance, the family structure, values system of the family, behaviors practiced in the family as inculcated by the head of the family whether father or other member of the family influences the hardiness of the member of that family. In addition, work status of the father or breadwinner in the family depict the financial stability of the family. Hence, reducing the stressors associated with basic life needs and exposing a person to better life opportunities thus, positively influencing the hardiness and vice versa. Moreover, values and beliefs significant to particular region or province of the Pakistan may also influences belief system of the person exposing some to have more resilient outlook towards life than others. With respect to religion, specifically in Pakistan people believe in fate and luck. Based on religious beliefs of Islam which is widely practiced in Pakistan people believe in predetermined life circumstances hence, they may have high external locus of control. Thus, this may influence their hardiness as hardiness

emphasizes on internal locus of control. The marital status may also influence hardiness of a person. For instance, divorced or widowed individuals may go through significant adverse life changes and experiences, which may impact their sense of challenge and control in their lives. Married individuals on the other hand may experience high level of social support, belongingness and commitment towards life which impacts their hardiness positively. Nevertheless, the case can be opposite if the marital life is unsatisfactory. With respect to financial independence there may be a possibility that it may foster a sense of commitment and responsibility towards one's goals and aspirations. Financial independence may also develop a stronger sense of autonomy and control over life. On the other hand, financial dependence of a person may be associated with a perceived lack of control and limited opportunities for personal growth as person may feel reliant on others to fulfil their needs. All these are possible reasons regarding how demographic characteristics may influence hardiness level. Further research is required to confirm these probable reasons.

Factor Analysis

Keeping into consideration significance of culture in influencing hardiness (Mund,2017), the aim of the study was to assess the psychometric properties of Cognitive Hardiness Scale ((Nowack,1990) in Pakistani context. The previous studies suggest that culture plays a significant role in predicting extent of hardiness. Each culture has its own stressors, values, norms, beliefs and way of dealing with life adversities. Therefore, culture must be taken into consideration when assessing the extent of hardiness (Mund, 2017). In fact, CHS 30-item measure had fairly low reliability (.61) in Pakistani context as compared to previous studies done in other cultures (Nowack, 1990; Andrassay 1992; Schwartz et al., 1992; Green et al, 2007;

Nowack & Greene, 2015). This indicates that cultural variance influence hardiness and how it is perceived in the society.

Keeping in view the importance of culture, CFA was performed to assess the factor structure of the CHS in Pakistani context. Since many previous studies have indicated presence of other dimensions of hardiness as well that are specific to the culture and environment (Maddi, 2005; Mund, 2017). The results from the CFA failed to support the single factor structure of the CHS as proposed by the author of the scale (Nowack, 1990), indicating possibility for cultural influence on hardiness.

An interesting finding of the study is that EFA presented 3 factor solution to be good model fit. These three factors can be considered as commitment control and challenge as proposed by Kobasa (1979). The presence of dimensions can be further supported by the fact that personality theory of hardiness also proposed three dimension of hardiness (Kobasa,1979). In addition, the expert opinion taken before EFA also indicated that people comprehend the items on the basis of 3 factors proposed by Kobasa (1979). CFA further confirmed that CHS structure is best explained by three factors as indicated by high level of goodness of fit statistics (CFI=.92 and RMSEA=.03 (CI=.01-.04)). However, at the same time some items showed low factor loadings which indicated room for improvement on 30 item measure. Thus, it was concluded that 30-item measure would benefit from modification. Overall fit of the model improved when 7 items (1,3,10,13,16,17,22) were removed from the final model and certain items were loaded on other factors as indicated by modification indices. The change in the factor structure of CHS and exclusion of the items can be justified statistically with model fit statistics whereas exclusion of items can be justified through low factor loadings. The other possible reasons maybe that the scale is originally developed and validated in different cultural context, thus due to cultural differences, different experiences and

perspectives of people they may have interpreted the statements differently. In fact, expert opinion also indicated variance in interpretation of various items. The same item was categorized into different factors e.g commitment, control and challenge (Appendix H) by different experts. All this indicates possibility of influence of culture on hardiness and how it is perceived differently in Pakistani society.

Further, certain items such as 4, 5,6,19,26, and 29 had significant factor loading but the variance explained by these items was very low and insignificant. Nevertheless, due to significant loading they were retained. The possible reason for low variance could be the half sample size that was used for CFA ($n=207$). Therefore, those who wish to extend upon this study the suggestion is to test the new factor structure on larger sample. There is possibility that these items would also become significant on larger sample. Another possible reason could be that there are more than three factors of hardiness in Pakistan as it has been found in other cultures (Maddi, 2005; Mund, 2017). To conform this reasoning, further research is needed.

Moreover, the results showed negative relation between control and challenge component of the scale. Similar findings have been reported in previous studies as well indicating that challenge component of hardiness negatively relate to control component (Hull et al., 1887; Funk, 1992). These studies have not reported any specific reason behind such findings. One possible explanation could be that control construct is sensitive to culture (Jamal & Baba, 2016). In Pakistan, the concept of control is often seen as a way to maintain stability in life. Thus, people show reluctance to change.

The final 23 item Urdu version of CHS with 3 factor structure showed good model fit. Thus, result confirm the construct validity of the modified scale. Yet, further

research is required to conform the proposed factor structure of CHS reasonable for Pakistani population.

Reliability Analysis

Moreover, reliability testing revealed that commitment and challenge subscales of Cognitive Hardiness Scale have satisfactory reliability whereas control subscale has weak reliability. The weak reliability of the control subscale may be improved on larger data set.

Validity Analysis

Previous research suggests individuals who are hardier they experience less anxiety and depression (Bartone et al., 2022). As expected, the correlation patterns showed commitment and challenge components of hardiness to be significantly negatively related with the anxiety and depression. The control component, however, had insignificant relation with both anxiety and depression. The possible reason behind these findings could be lower reliability of control subscale. Another reason can be attributed to the fact that external locus of control plays significant role in predicting depression while internal locus of control shows no variance (Griffin, 2014). In case of hardiness, the control component refers to internal locus of control and a belief that events in life are results of one's own actions. Thus, such finding is logical.

Griffin (2014) suggested that usually unidimensional definition of locus control is used, indicating higher internal locus to be associated with higher psychological wellbeing and higher external locus to be associated with low psychological wellbeing. If internal and external locus of control are considered as separate constructs. Then, it would be evident that not high internal locus of control but, low external locus of control

affects psychological wellbeing. This implies internal locos of control have no unique association with psychological wellbeing of a person.

The results of control subscales are unclear and complex in the present study. Similar issues have been reported in the another study of one of the scales discussed in the literature review, Family Hardiness Index (Carina et al., 2016). The study stated that certain concepts are more sensitive to culture including control concept therefore require detailed examination of conceptual equivalence. In translation process Brislin's back translation method was used, indicating priority of content and semantic equivalence with original version (Carina et al., 2016). Thus, maybe this have contributed to inconsistent behavior of control subscale in the present study as well. Further research is required to confirm this reasoning.

Gender, Age and perceived Socioeconomic Difference in Hardiness

With respect to gender difference in hardiness, the extent literature has been mixed and is not always consistent. The present study hypothesized that there would be significant difference in hardiness among male and female. However, the results do not support the hypothesis 2. These results are consistent with the findings of the previous studies conducted in Pakistan (Shahid, 2015; Gul & Hyder, 2020). Some other studies also showed no meaningful difference in these genders with respect to hardiness (Harrisson et al., 2002; Maddi et al, 2006; Hosseinpour et al., 2008; Kazmi, Gul, & Saeed, 2021). Hardiness is a multifaceted construct that is influenced by various factors including cultural context, social norms, personality traits, personal experiences and individual characteristics like educational background, and age ranges (Chaboyer & Wallis, 2009; DuBois, Anderson, & Keller, 2014). Therefore, individual differences often outweigh differences between genders as complexity and diversity of human experiences are more substantial. Overtime, cultural changes, including gender roles

and expectations have also evolved (Ali, 2016; Ahmed, 2017; Kamal & Arif, 2021). These changes include access to education for both genders and improved representation of females in job sector. Thus, leading to more similar experiences for both males and females. As a result, there is a possibility that the difference in hardiness may have diminished.

The hypothesis 3 proposed that there may be an association between cognitive hardiness and age. This hypothesis is supported by the results. The results indicated significant positive correlation between age and hardiness, suggesting with age increase in age the hardiness level increases. Similar results are found in the other studies as well indicating that with age hardiness level changes (Bartone, 2007; Boldero & Gallagher, 2010; Bowles & Turner, 2016; Polenick et al., 2017). These generational studies indicate that with age hardiness level increases. The possible reason behind such finding could be that with age exposure to variety of events increases and the accumulation of life experiences, and increased coping skills improves hardiness level among people over time.

Lastly, with respect to hypothesis 4, the study found insignificant difference between perceived socioeconomic status e.g income group and hardiness. These findings are consistent with the literature available (Fergus, Zimmerman, & Weiner, 2011; Hu, Zhang, & Wang, 2018), which suggests that individual experiences and personal characteristics have more prominent influence on hardiness. While keeping in view other studies that indicate that people from different socioeconomic groups differ in their level of hardiness suggest that the difference is due to different life experiences (Beasley & Thompson, 2019). The possible reason behind this finding could be attributed to relatively homogenous socioeconomic environment or income distribution range within the sample. As the sample was collected from private and government

university of Pakistan where mostly people from middle income send their children as compared to people from lower income group due to affordability of the expenses (Jamal, 2016). On the other hand, higher income group often have more financial capabilities therefore prefer elite or professional institutes or move to abroad for higher studies (Hui & Khan, 2021). Thus, shared experiences of middle income group and exposure to similar life circumstances may minimize their variation on hardiness level.

Conclusion

To sum up, findings of the study suggest that three factors of Cognitive hardiness scale are identifiable in Pakistani context. Therefore, these three factors must be considered when assessing hardiness. In addition, modified CHS with three factor structure and 23 items has satisfactory psychometric properties as depicted by satisfactory internal consistency reliability of commitment (.68) and challenge (.71) subscale. The control subscale, however, has weak reliability (.58). The convergent validity is also evident by statistically significant moderate negative correlation of the commitment ($r=-.417, p<0.01$) and challenge ($r=-.404, p<0.01$) subscale with anxiety subscale of HADS, and with depression subscale commitment ($r=-.505, p<0.01$) and challenge ($r=-.294, p<0.01$) subscale also has significant negative correlation. Unexpectedly, control subscale showed insignificant relation with anxiety and depression. In addition, there exist no significant difference in level of hardiness among Pakistani population with respect to gender ($U=37711, p>0.05$), and socioeconomic status ($H(2)=.23, P>0.05$), indicating that maybe other factors like culture social norms and individual differences to have more influence on hardiness. However, there is significant positive association between age and hardiness ($r=.202, p<0.01$) indicating that with increase in age the hardiness increases.

Limitations

Following are the limitations of the study;

1. Due to limited resources and time constraints, data has only been collected from Islamabad and Rawalpindi.
2. The data is limited to a sample of university students. Hence, it may be difficult to generalize the findings to other populations.
3. Test retest reliability has not been established due to time constraints.
4. Due to lack of availability of local/standardized appropriate comparable scale in Pakistan, discriminant and concurrent validity have also not been established.
5. With respect to demographic characteristics, many participants reported other member of the family to be head of the family. It was assumed that they may belong to joint family structure. Nevertheless, the cross tab between the two indicated out of all the participants who reported other member of the family to be head 59.5% were from nuclear family structure whereas 40.5% from joint family structure. The possible reason behind it could be that maybe father is no more or the head of the family maybe husband. The present study was not able to explore it in detail. Further research should be done to deduce any results.
6. In the present study perceived socioeconomic status was assessed. In the future more objective measure can be used to assess socioeconomic status.
7. Various items have insignificant variance but still they are made part of the due to significant factor loading. This could be because of small sample size used in CFA. Thus, it is suggested to test this factor structure on larger sample.

Implications/Recommendations

This study may have the following significant implications;

1. The current research helps to determine the application of the Nowack scale for measuring cognitive hardiness in the context of Pakistan.
2. The results of the study indicate that the “Cognitive Hardiness Scale” should be used vigilantly and carefully in assessing hardiness in Pakistani context in association with different personal and professional constructs both in clinical and organizational settings.
3. As mentioned earlier, hardiness is present among Pakistani population. Therefore, establishing the psychometric properties of a hardiness scale with reference to Pakistani culture may help to improve the quality of research involving this construct.
4. Future studies should work on assessing test retest reliability of the scale as well as discriminant and concurrent validity in order to strengthen the scale reliability and validity of the scale. Thereby making it psychometrically sound.
5. In present study validity was assessed in university students, future studies should evaluate its applicability on other populations as well.
6. Keeping in view demographic characteristic of religious affiliation, future studies should consider assessing association between religion and hardiness. In Pakistan Islam is a widely practiced religion which promotes the believe in predetermined life circumstances and fate. Thus, people may have high external locus of control. This may influence their hardiness level.

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Appendices

Appendix A



Approval from the Author of Cognitive Hardiness Scale

Sun, Oct 16, 4:08

Ken Nowack <ken@envisialearning.com> AM

to me, knowack

Arooba....HI...I am able to provide permission to use my Cognitive Hardiness scale for your research.

Do you have the items/questions and scoring for the 30-item assessment?

I would be keen to learn more about what other measures you will be using to help validate it and results when available.

I am attaching the most recent academic paper summarizing research on the scale that might be of value for your references.

Please let me know if you have any other questions.

Good luck with your study! Be well...

Ken

Kenneth Nowack, Ph.D.

Chief Research Officer

Appendix B

Information sheet

معلوماتی فارم

میں عروبہ ارشد، کیپٹل یونیورسٹی آف سائنس اینڈ ٹیکنالوجی، اسلام آباد کی طالبہ ہوں۔ اور آپ کو اس تحقیق میں حصہ لینے کی دعوت دینا چاہتی ہوں۔ تحقیق میں حصہ لینے سے پہلے یہ سمجھنا ضروری ہے کہ یہ تحقیق کیوں کی جا رہی ہے، اس میں آپ نے کیا کردار ادا کرنا ہے اور حصہ لینے کے کیا فائدے یا نقصانات ہیں۔

برائے مہربانی مندرجہ ذیل معلومات کو احتیاط سے پڑھیں۔ اگر آپ مزید کوئی سوال کرنا چاہتے ہیں تو آپ پوچھ سکتے ہیں۔

تحقیق کا مقصد

اس تحقیق کا مقصد پاکستانی تناظر میں نیچے دیے گئے سوال نامے کی خصوصیات کا جائزہ لینا ہے۔ Hardiness ایک ایسی خصوصیت ہے کہ جو ایک شخص کو مشکل وقت میں مثبت رکھتی ہے۔

تحقیق میں حصہ لے کر کرنا کیا ہوگا

اس تحقیق میں حصہ لینے کے لیے اپنی رضامندی ظاہر کرنے کے بعد آپ کو کچھ کاغذ دیے جائیں گے جس پر موجود کچھ سوالات کے آپ کو جواب دینے ہوں گے۔ آپ سے حاصل کردہ معلومات کو محفوظ رکھا جائے گا۔ تحقیق مکمل ہونے کے بعد ان کاغذات کو ضائع کر دیا جائے گا۔ معلومات کسی اور کو نہیں دی جائے گی۔ اس تحقیق میں حصہ لینے سے کوئی ذاتی فائدہ یا نقصان نہیں ہوگا۔ البتہ، اس تحقیق میں کوئی قابل شناخت شرکت کے لیے 15-20 منٹ درکار ہوں گے۔

اگر آپ کے کوئی سوالات یا خدشات ہیں تو براہ کرم بلا جھجھک یہاں رابطہ کریں

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مددگار اداروں کا پتہ

ں رابطہ کر سکتے ہیں۔ اگر آپ تحقیق میں حصہ لینے کی وجہ سے کسی بھی قسم کی ذہنی پریشانی محسوس کریں تو آپ یہاں

Well-being Center

Capital University of Science and Technology, Islamabad

نمبر: 051-111555666 Ext: 2966

یا

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ں آپ صبح 9 سے 5 بجے تک جا سکتے ہیں۔ یہاں

پتہ: کیپٹل یونیورسٹی آف سائنس اینڈ ٹیکنالوجی، کمونہ روڈ، اسلام آباد

روزان

روزان کاؤنسلنگ ہیلپ لائن ہفتے کے سات دن میسرے یہاں آپ صبح 10 بجے سے شام 8 بجے تک رابطہ کر سکتے ہیں۔

نمبر: 0304-111-1741

پتہ: سیکٹر مال، سیکٹر اے بحریہ انکلیو، اسلام آباد

Appendix C

Informed consent

رضامندی فارم

میں تصدیق کرتا/ کرتی ہوں کہ مجھے اس پروگرام میں ہونے والی سرگرمیوں اور طریقے سے آگاہ کر دیا گیا ہے۔ اور مجھے نہ صرف تحقیق کے متعلق سوال کرنے کا حق دیا گیا ہے بلکہ میرے سوالات کا تسلی بخش جواب دیا گیا ہے۔ میں جانتا/ جانتی ہوں کہ میری شرکت رضاکارانہ ہے۔ اور مجھے کسی بھی وقت بغیر کسی نقصان یا فائدے کے پروگرام میں شرکت ختم کرنے کی اجازت ہے۔ میں جانتا/ جانتی ہوں کہ دی گئی معلومات کو خفیہ رکھا جائے گا اور میری اجازت کے بغیر کسی اور کو نہیں دی جائے گی۔ اور اسے صرف تحقیقی مقصد کے لیے استعمال کیا جائے گا۔

میں فراہم کی گئی معلومات کو سمجھتا/ سمجھتی ہوں اور میں اس تحقیق میں حصہ لینے کے لیے رضامند ہوں۔

_____ دستخط

_____ تاریخ

Appendix D

Demographic Sheet

سوال نمبر	سوال	جواب
1	آپ کا کیا نام ہے؟	
2	آپ کی عمر کتنی ہے؟	
3	آپ کی جنس کیا ہے؟	لڑکی <input type="checkbox"/> لڑکا <input type="checkbox"/> کوئی اور _____
4	کیا آپ؛	کنوارے / کنواری ہیں کسی کے ساتھ (رومانوی) تعلق میں منگنی شدہ ہیں شادی شدہ ہیں
5	آپ کہاں کے رہنے والے / والی ہیں؟	
6	آپ کا کس مذہب سے تعلق ہے؟	
7	آپ کی تعلیم کیا ہے؟	
8	آپ کس مضمون میں تعلیم حاصل کر رہے ہیں؟	
9	آپ کس کے ساتھ رہتے / رہتی ہیں؟	والدین اور بھائی بہن کے ساتھ دادا، دادی اور رشتہ داروں کے ساتھ کسی اور کے ساتھ وضاحت کریں
10	آپ کے والد / سرپرست کیا کام کرتے ہیں؟	
11	آپ کی والدہ / سرپرست کیا کام کرتی ہیں؟	

		آپ کے کتنے بہن بھائی ہیں؟	12
		آپ کا اپنے بہن بھائی میں کون سا نمبر ہے؟	13
		آپ اپنی روزمرہ زندگی کی ضروریات کس طرح پوری کرتے / کرتی ہیں؟	14
		آپ کا تعلق کس انکم گروپ کے ساتھ ہے۔	15
		لوئر انکم گروپ <input type="checkbox"/> مڈل انکم گروپ <input type="checkbox"/> ہائر انکم گروپ <input type="checkbox"/>	
		آپ کے گھر کا سربراہ کون ہے؟	16
		آپ کے گھر کے سربراہ کی تعلیم کیا ہے؟	17
		آپ کے گھر کے سربراہ کا کیا پیشہ ہے؟	18
		کیا آپ مشترکہ خاندانی نظام کا حصہ ہیں (Joint family) یا علیحدہ رہتے ہیں (Nuclear family)؟	19
		<input type="checkbox"/> علیحدہ <input type="checkbox"/> مشترکہ خاندانی نظام Nuclear family Joint family	
		کیا آپ کو ڈاکٹر نے کبھی صحت کا کوئی مسئلہ یا بیماری بتائی ہے؟	20
		نہیں <input type="checkbox"/> ہاں پہلے بتائی تھی <input type="checkbox"/> ہاں ابھی بتائی ہے <input type="checkbox"/>	
		اگر ہاں تو کون سی؟ وضاحت کریں _____ _____	
		کیا آپ نے کبھی زندگی میں نفسیاتی مدد حاصل کی ہے؟	21
		نہیں <input type="checkbox"/> ہاں پہلے مدد حاصل کی تھی <input type="checkbox"/> ہاں ابھی مدد حاصل کی ہے <input type="checkbox"/>	
		اگر ہاں تو کس قسم کی؟ وضاحت کریں _____ _____	

Appendix E

Cognitive hardiness – Urdu version

نیچے ایسے عقیدوں کی فہرست دی گئی ہے جو عام طور پر لوگ رکھتے ہیں۔ ہر جملے سے آپ کتنا متفق یا غیر متفق ہیں۔ درست جواب والے نمبر کے گرد دائرہ (O) لگائیں۔

1= بہت زیادہ متفق ، 2= متفق ، 3= نا متفق نا ہی غیر متفق ، 4= غیر متفق ، 5= بہت زیادہ غیر متفق

سیریل نمبر	جملے	بہت زیادہ متفق	متفق	نا متفق نا ہی غیر متفق	غیر متفق	بہت زیادہ غیر متفق
1	میرا کام کے علاوہ دوسرے کاموں اور مشاغل میں شامل ہونا مجھے زندگی میں معنی اور مقصد کا احساس دلاتا ہے۔	1	2	3	4	5
2	لوگوں کے سیاسی اور سماجی کاموں میں بھرپور حصہ لینے سے لوگ دنیا میں ہونے والے واقعات اور سیاست پر گہرا اثر ڈال سکتے ہیں۔	1	2	3	4	5
3	جب ہر طرف مایوسی ہوتی ہے تو میں ہمیشہ اپنے گھر والوں اور دوستوں سے مدد اور سہارا مانگ سکتا/سکتی ہوں۔	1	2	3	4	5
4	ایک ہی طرح کے آرام دہ معمول اور طرز زندگی کے بجائے میں خطرناک، دلچسپ اور جرات مندانہ چیزیں کرنے کو ترجیح دیتا/دیتی ہوں۔	1	2	3	4	5
5	کامیاب ہونے کا زیادہ تر تعلق محنت سے کام کرنے سے ہے۔ قسمت کا اس میں معمولی یا کوئی کردار نہیں ہے۔	1	2	3	4	5
6	میری ذات کے ایسے بہت کم پہلو ہیں جن میں، میں غیر محفوظ، بہت زیادہ اپنے بارے میں حساس یا اعتماد کی کمی محسوس کرتا/کرتی ہوں۔	1	2	3	4	5
7	عام طور پر کام اور زندگی کے زیادہ تر معاملات میں میرا رجحان تھوڑا سا تنقیدی، مایوس اور ناک چڑا ہو جاتا ہے۔	1	2	3	4	5
8	میرے کام کے موجودہ حالات میں بہت ہی تھوڑی سی تبدیلی میرے اپنے موجودہ ادارے کو چھوڑ دینے کی وجہ بنے گی۔	1	2	3	4	5

5	4	3	2	1	<p>میں اپنے خاندان اور دوستوں کی روزمرہ سرگرمیوں اور انکی خیبت میں اپنے موجودہ کردار سے مطمئن محسوس نہیں کرتا/کرتی ہوں۔</p>	9
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سیریل نمبر	جملے	بہت زیادہ متفق	بہت زیادہ متفق	نا متفق نا ہی غیر متفق	غیر متفق	بہت زیادہ غیر متفق
10	عام طور پر میں چیزوں کو پہلے سے اچھی طرح پلان کرنے کو ترجیح دوں گا/گی نہ کہ نامعلوم (صورت حال) سے نمٹنے کو۔	1	2	3	4	5
11	زندگی کا زیادہ تر حصہ بے مقصد چیزوں میں ضائع ہو جاتا ہے۔	1	2	3	4	5
12	میل جول کے لیے دوسروں کے ساتھ بات کرتے ہوئے میں اکثر عجیب، بے چین، یا غیر محفوظ محسوس کرتا/کرتی ہوں۔	1	2	3	4	5
13	میں بہت کم اپنے آپ کو باآواز بلند یہ کہتے یا سوچتے ہوئے پاتا/پاتی ہوں کہ میں اتنا اچھا/اچھی نہیں یا کچھ حاصل کرنے کے قابل نہیں ہوں۔	1	2	3	4	5
14	میں اپنی نوکری اور جن سرگرمیوں میں مصروف ہوں ان کی ذمہ داری نبھاتا/نبھاتی ہوں۔	1	2	3	4	5
15	میں اپنے کام اور زندگی کی زیادہ تر تبدیلیوں، مایوسیوں اور دھچکوں کو چیلنج کے طور پر دیکھنے کی بجائے خطرناک، نقصان دہ اور پریشان کن دیکھتا/دیکھتی ہوں۔	1	2	3	4	5
16	میں صرف وراثی کے لیے ایسی جگہوں کے سنے اور مختلف راستے ڈھونڈتا/ڈھونڈتی ہوں جہاں میں باقاعدگی سے جاتا/جاتی ہوں (جیسا کہ گھر، دفتر)۔	1	2	3	4	5
17	دوسرے اپنے ذاتی مفاد کے مطابق کام کریں گے چاہے میں ان پر اثر ڈالنے کے لیے کچھ بھی کہنے یا کرنے کی کوشش کروں۔	1	2	3	4	5
18	اگر مجھے یہ دیکھنے کا موقع ملے کہ دوسروں نے کس طرح کوئی چیز کی ہے یا موقع ملے کہ سیکھایا جائے کہ کیا کرنا ہے، مجھے یقین ہے کہ میں تقریباً کسی بھی چیز میں کامیاب ہو سکتا/سکتی ہوں۔	1	2	3	4	5
19	میں یہ توقع رکھتا/رکھتی ہوں کہ چیزیں کبھی کبھار غلط ہو سکتی ہیں مگر میرے ذہن میں شاید ہی کوئی شک ہو کہ میں اپنے راستے میں آنے والی کسی بھی چیز سے واقعی ہی منٹ سکتا/سکتی ہوں۔	1	2	3	4	5
20	مجموعی طور پر زیادہ تر چیزیں جن میں، میں شامل ہوں (جیسا کہ نوکری، کمیونٹی، سماجی تعلقات) بہت زیادہ حوصلہ افزاء، پرلطف اور فائدہ مند نہیں ہیں۔	1	2	3	4	5

سیریل نمبر	جملے	بہت زیادہ متفق	متفق	نا متفق نا ہی غیر متفق	غیر متفق	بہت زیادہ غیر متفق
21	اگر میرے پلان میری امید کے مطابق واضح نہیں ہوتے یا چیزیں اس طرح نہیں ہوتیں جیسا میں واقعی چاہتا/ چاہتی ہوں تو میں تنگ اور پریشان ہو جاتا/ جاتی ہوں۔	1	2	3	4	5
22	میرے محنت سے کام کرنے اور جو کامیابی اور عزت مجھے ملے گی اس میں ڈائریکٹ تعلق ہے۔	1	2	3	4	5
23	مجھے ایسا نہیں لگتا کہ میں نے حال میں بہت کچھ ایسا حاصل کیا ہے جو میرے مستقبل کے گول (goal) اور زندگی کے مقاصد کے لیے بہت زیادہ ضروری یا با معنی ہو۔	1	2	3	4	5
24	میں اکثر سوچتا/ سوچتی ہوں کہ ان لوگوں کی نسبت میں بے ہنر، نااہل، یا کم اہم ہوں جن کے ساتھ میں کام کرتا/ کرتی ہوں اور جن کو جانتا/ جانتی ہوں۔	1	2	3	4	5
25	بہت دفعہ مجھے ایسا محسوس ہوتا ہے کہ میرا اپنے ساتھ ہونے والی چیزوں پر بہت تھوڑا یا کوئی قابو اور اثر نہیں ہے۔	1	2	3	4	5
26	میں محسوس کرتا ہوں کہ اگر ابھی اسی وقت میری زندگی میں کچھ بھی بدل جاتا ہے یا غلط ہو جاتا ہے تو ہو سکتا ہے میں اس سے واقعی ہی نشتے کے قابل ہوں۔	1	2	3	4	5
27	جب لوکری یا گھر میں کوئی تبدیلی آتی ہے تو میں اکثر خود کو سوچتا ہوا پاتا/پاتی ہوں کہ بدترین ردما ہونے والا ہے۔	1	2	3	4	5
28	اس وقت لوکری یا گھر پر چیزیں کافی حد تک توقع کے مطابق ہیں اور کوئی مزید تبدیلی سنبھالنا بہت زیادہ مشکل ہوگا۔	1	2	3	4	5
29	آپ اتنے زیادہ لوگوں پر بہت یقین نہیں کر سکتے کیوں کہ زیادہ تر لوگ آپ کو استعمال کر کے اپنی فلاح اور خوشی کے راستے تلاش کر رہے ہوتے ہیں۔	1	2	3	4	5
30	کامیابی کی ظاہری تعریف، حاصل کردہ مقصد اور ذاتی اطمینان کے بجائے زندگی کے زیادہ تر معنی، (آپ کے) اپنے اندر سے آتے ہیں۔	1	2	3	4	5

Appendix F

Cognitive hardiness- English Version

Below is a list of common beliefs people hold. How strongly do you agree or disagree with each statement? (1=Strongly Agree, 2=Agree, 3=Neither Agree nor Disagree, 4=Disagree, 5=Strongly Disagree).

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
1. My involvement in non-work activities and hobbies provides me with a sense of meaning and purpose.	1	2	3	4	5
2. By taking an active part in political and social affairs, people can strongly influence world events and politics.	1	2	3	4	5
3. When all else appears bleak, I can always turn to my family and friends for help and support.	1	2	3	4	5
4. I prefer to do things that are risky, exciting, and adventuresome rather than adhere to the same comfortable routine and lifestyle.	1	2	3	4	5
5. Becoming a success is mostly a matter of working hard—luck plays little or no role.	1	2	3	4	5
6. There are relatively few areas about myself in which I feel insecure, highly self-conscious or lacking in confidence.	1	2	3	4	5
7. In general, I tend to be a bit critical, pessimistic, and cynical about most things in work and life.	1	2	3	4	5
8. It would take very little change in my present circumstances at work to cause me to leave my present organization.	1	2	3	4	5
9. I do not feel satisfied with my current involvement in the day-to-day activities and well-being of my family and friends.	1	2	3	4	5

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
10. In general, I would prefer to have things well planned out in advance rather than deal with the unknown.	1	2	3	4	5
11. Most of life is wasted in meaningless activity.	1	2	3	4	5
12. I often feel awkward, uncomfortable, or insecure interacting with others socially.	1	2	3	4	5
13. I rarely find myself saying out loud or thinking I am not good enough or capable of accomplishing something.	1	2	3	4	5
14. I am committed to my job and work activities that I am currently involved in.	1	2	3	4	5
15. I tend to view most work and life changes, disappointments and setbacks as threatening, harmful and stressful rather than challenging.	1	2	3	4	5
16. Just for variety's sake I often explore new and different routes to places that I travel to regularly (e.g., home, work).	1	2	3	4	5
17. Others will act according to their own self-interests no matter what I attempt to say or do to influence them.	1	2	3	4	5
18. If I get a chance to see how others have done something or get the opportunity to be taught what to do, I am confident that I can be successful at most anything.	1	2	3	4	5
19. I expect some things to go wrong now and then but there is little doubt in my mind that I can effectively cope with just about anything that comes my way.	1	2	3	4	5

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
20. Overall, most of the things I am involved in (e.g., work, community, social relationships) are not very stimulating, enjoyable, and rewarding.	1	2	3	4	5
21. I am likely to get frustrated and upset if my plans do not unfold as I hoped, or if things do not happen the way I really want them to.	1	2	3	4	5
22. There is a direct relationship between how hard I work and the success and respect I will have.	1	2	3	4	5
23. I do not feel that I have accomplished much lately that is really important or meaningful with respect to my future goals and objectives in life.	1	2	3	4	5
24. I often think I am inadequate, incompetent, or less important than others with whom I work and that I know.	1	2	3	4	5
25. Many times, I feel that I have little or no control and influence over things that happen to me.	1	2	3	4	5
26. If anything else changes or goes wrong in my life right now, I feel that I might be able to effectively cope with it.	1	2	3	4	5
27. When change occurs at work or home, I often find myself thinking that the worst is going to happen.	1	2	3	4	5

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
28. At the moment, things at work and at home are predictable and any more changes would just be too much to handle.	1	2	3	4	5
29. You cannot really trust that many people because most individuals are looking for ways to improve their welfare and happiness at your expense.	1	2	3	4	5
30. Most of the meaning in life comes from internal, rather than, external definitions of success, achievement, and self-satisfaction.	1	2	3	4	5

Appendix G

Hospital Anxiety and Depression Scale

اگلے سوالات اس بارے میں ہیں کہ آپ حال ہی میں (آج کل) کیسا محسوس کرتے رہے / کرتی رہی ہیں - برائے مہربانی اس جواب کا انتخاب کریں جو آپ کی کیفیت بہترین طور پر بیان کرتا ہے۔

کبھی نہیں	کبھی کبھار	بہت وقت	اکثر اوقات	1) میں ذہنی تناؤ/دباؤ محسوس کرتا/کرتی ہوں۔
نہ ہونے کے برابر	بہت کم	پہلے سے کچھ کم	یقیناً پہلے کی طرح	2) مجھے اب بھی چیزوں میں پہلے کی طرح مزہ آتا ہے۔
بالکل نہیں	تھوڑا لیکن مجھے پریشان نہیں کرتا	ہاں لیکن اتنا برا نہیں	یقیناً بری طرح	3) مجھے خوف اور ڈر محسوس ہونے لگتا ہے جیسے کوئی خطرناک بات ہونے والی ہے۔
بالکل نہیں	یقیناً پہلے سے کم	پہلے سے کم	بہمیشہ کی طرح اتنا ہی	4) میں ہنس سکتا/سکتی ہوں اور چیزوں کے مزاحیہ پہلو کو دیکھ سکتا/سکتی ہوں۔
بہت ہی کم	کبھی کبھار لیکن اکثر نہیں	بہت وقت	بہت ہی زیادہ وقت	5) پریشان کرنے والے خیالات میرے ذہن میں آتے ہیں۔
اکثر اوقات	کبھی کبھار	اکثر نہیں	بالکل نہیں	6) مجھے خوشی محسوس ہوتی ہے۔
بالکل نہیں	اکثر نہیں	عام طور پر	یقیناً	7) میں آرام سے بیٹھ سکتا/سکتی ہوں اور سکون محسوس کر سکتا/سکتی ہوں۔
بالکل نہیں	کبھی کبھار	بہت دفعہ	تقریباً ہر وقت	8) مجھے محسوس ہوتا ہے جیسے میں سست ہو گیا/گئی ہوں۔
بہت دفعہ	اکثر	کبھی کبھار	بالکل نہیں	9) مجھے خوف اور ڈر محسوس ہوتا ہے اور معدے میں گھبراہٹ محسوس ہوتی ہے۔
میں پہلے جتنا خیال رکھتا/رکھتی ہوں	میں شاید پہلے سے کم خیال رکھتا/رکھتی ہوں	میں اتنا خیال نہیں رکھتا/رکھتی جتنا رکھنا چاہیے	یقیناً	10) مجھے اپنے حلیے میں دلچسپی نہیں ہے۔ (جیسے میں کپڑے پہنتا یا پہنتی ہوں، تیار ہونا یا ہوتی ہوں)
بالکل نہیں	زیادہ نہیں	زیادہ	بہت ہی زیادہ	11) مجھے ایسے بے چینی ہوتی ہے جیسے کہ مجھے کچھ نہ کچھ کرتے رہنا چاہیے۔
نہ ہونے کے برابر	یقیناً پہلے سے کم	پہلے سے کم	پہلے کی طرح	12) میں شوق سے چیزوں کا/کی منتظر رہتا/رہتی ہوں۔ (انتظار کرنا)
بالکل نہیں	اکثر نہیں	اکثر اوقات	یقیناً اکثر اوقات	13) مجھے اچانک خوف یا ڈر محسوس ہونے لگتی ہے۔
بہت کم	اکثر نہیں	کبھی کبھار	اکثر	14) میں اچھی کتاب، ریڈیو یا ٹی وی پروگرام کا مزہ اٹھا سکتا/سکتی ہوں۔

Appendix H

Expert Opinions

S r N o	Item Statement	R1	R2	R3	R4	R5	R6	R8	R9	Total
1	My involvement in nonwork activities and hobbies provides me with a sense of meaning and purpose	Communication	Control	control	Commitment	Commitment	Commitment	Commitment	commitment	Commitment =6 Control=2 Challenge=0
2	By taking an active part in political and social affairs, people can strongly influence world events and politics	Challenge	Commitment	Challenge	Commitment	Control	Control	Control	Control	Commitment =2 Control=4 Challenge=2
3	When all else appears bleak I can always turn to my family and friends for help and support	Control	commitment	Commitment	commitment	commitment	control	Challenge	Commitment	Commitment =5 Control=2 Challenge=1
4	I prefer to do things that are risky, exciting, and adventuresome rather than adhere to the same comfortable routine and lifestyle	Challenge	Challenge	control	Challenge	Challenge	challenge	Challenge	Control	Commitment =0 Control=2 Challenge=6
5	Becoming a success is mostly a matter of working hard-luck plays little or no role	Control	Control	control	Control	Control	control	Control	Control	Commitment =0 Control=8 Challenge=0
6	There are relatively few areas about myself in which I feel insecure, highly self-conscious, or lacking in confidence	commitment	Control	control	Control	Control	control	Control	Challenge	Communication/ Commitment =1 Control=7 Challenge=1
7	In general, I tend to be a bit critical, pessimistic, and cynical about most	Challenge	commitment	Commitment	Control	Control	challenge	Control	Control	Commitment =3 Control=4 Challenge=2

	things in work and life									
8	It would take very little change in my present circumstances at work to cause me to leave my present organization	Control	commitment	Challenge	Challenge	Commitment	Commitment	Commitment	Commitment	Commitment =5 Control=1 Challenge=2
9	I do not feel satisfied with my current involvement in the day-to-day activities and well-being of my family and friends	commitment	Commitment	Commitment	commitment	Commitment	-	challenge	commitment	Commitment =6 Control=0 Challenge=1
10	In general, I would prefer to have things well planned out in advance rather than deal with the unknown	Control	Control	Commitment	Challenge	Control	control	control	Challenge	Commitment =1 Control=5 Challenge=1
11	Most of life is wasted in meaningless activity	commitment	Challenge	Challenge	Control	Commitment	commitment	challenge	Challenge	Commitment =3 Control=1 Challenge=4
12	I often feel awkward, uncomfortable, or insecure interacting with others socially	commitment	commitment	Challenge	commitment	commitment	challenge	Challenge	Control	Commitment =4 Control=1 Challenge=3
13	I rarely find myself saying out loud or thinking I am not good enough or capable of accomplishing something	commitment	Challenge	Commitment	Challenge	Control	control	Challenge	Control	Commitment =2 Control=3 Challenge=3
14	I am committed to my job and work activities that I am currently involved in	Control	commitment	Commitment	commitment	Commitment	Commitment	Commitment	Control	Commitment =6 Control=2 Challenge=0

15	I tend to view most work and life changes, disappointments and setbacks as threatening, harmful and stressful rather than challenging	Control	Challenge	Challenge	Challenge	Challenge	challenge	Challenge	Challenge	Commitment =0 Control=1 Challenge=7
16	Just for variety's sake I often explore new and different routes to places that I travel to regularly (e.g., home, work)	Challenge	Challenge	Challenge	challenge	challenge	Commitment	Challenge	Control	Commitment =1 Control=1 Challenge=6
17	Others will act according to their own self-interests no matter what I attempt to say or do to influence them	control	Control	Commitment	Communication	communication	Control	Control	Commitment	Commitment =4 Control=4 Challenge=0
18	I get a chance to see how others have done something or get the opportunity to be taught what to do, I am confident that I can be successful at most anything	Control	Control	control	Control	control	Control	Commitment	Control	Commitment =1 Control=7 Challenge=0
19	I expect some things to go wrong now and then but there is little doubt in my mind that I can effectively cope with just about anything that comes my way	control	Control	Challenge	Control	challenge	Control	Control	Challenge	Commitment =0 Control=5 Challenge=3
20	Overall, most of the things I am involved in (e.g., work, community, social relationships) are not	Challenge	Challenge	control	Challenge	challenge	Commitment	Challenge	Commitment	Commitment =2 Control=1 Challenge=5

	very stimulating, enjoyable, and rewarding									
21	I am likely to get frustrated and upset if my plans do not unfold as I hoped, or if things do not happen the way I really want them to	Control	Control	control	Control	control	Control	Challenge	Control	Commitment =0 Control=7 Challenge=1
22	There is a direct relationship between how hard I work and the success and respect I will have	Control	Control	control	Control	Commitment	Control	Control	Control	Commitment =1 Control=7 Challenge=0
23	I do not feel that I have accomplished much lately that is really important or meaningful with respect to my future goals and objectives in life	commitment	Challenge	commitment	Control	challenge	Control	Challenge	Control	Commitment =2 Control=3 Challenge=3
24	I often think I am inadequate, incompetent, or less important than others with whom I work and that I know	commitment	Commitment	commitment	Control	Commitment	Control	Challenge	Commitment	Commitment =5 Control=2 Challenge=1
25	Many times, I feel that I have little or no control and influence over things that happen to me	Control	Control	control	Control	control	Control	Challenge	Control	Commitment =0 Control=7 Challenge=1
26	If anything, else changes or goes wrong in my life right now, I feel that I might be able to effectively cope with it	Challenge	Control	Challenge	Control	challenge	Challenge	Control	control	Commitment =0 Control=4 Challenge=4
27	When change occurs at work or home, I often find	Challenge	Challenge	Challenge	Challenge	challenge	Challenge	Challenge	Commitment	Commitment =1 Control=0 Challenge=7

	myself thinking that the worst is going to happen									
28	At the moment, things at work and at home are predictable and any more changes would just be too much to handle.	Control	Control	Challenge	Challenge	control	Challenge	Commitment	Control	/ Commitment=1 Control=4 Challenge=3
29	You cannot really trust that many people because most individuals are looking for ways to improve their welfare and happiness at your expense	commitment	Commitment	Commitment	-	commitment	control	Challenge	Control	Commitment =4 Control=2 Challenge=1
30	Most of the meaning in life comes from internal, rather than, external definitions of success, achievement, and self-satisfaction	commitment	Control	control	control	challenge	control	Control	control	Commitment =1 Control=6 Challenge=1

Appendix I

List of Changes

Revised version	Initial version	Item no
ایک ہی طرح کے آرام دہ معمول اور طرز زندگی کے بجائے میں خطرناک، دلچسپ اور جرأت مندانہ چیزیں کرنے کو ترجیح دیتا/دیتی ہوں۔	میں ایسے کاموں کو ترجیح دیتا ہوں جو خطرناک، دلچسپ اور ہمداری کے ہوں بجائے اس کے کہ وہی کی وہی پرسکون معمول کی طرز زندگی کی پابندی کروں۔	4
عام طور پر کام اور زندگی کے زیادہ تر معاملات میں میرا رجحان تھوڑا سائنٹیفی، مایوس اور تک چڑا ہو جاتا ہے۔	عام طور پر زندگی کے زیادہ تر چیزوں کے بارے میں میرا رجحان تھوڑا سائنٹیفی، مایوسانہ اور تک چڑا ہو جاتا ہے۔	7
میں اپنے خاندان اور دوستوں کی روزمرہ سرگرمیوں اور انکی خیریت میں اپنے موجودہ کردار سے مطمئن محسوس نہیں کرتا/کرتی ہوں۔	میں اپنی روزمرہ کی سرگرمیوں اور اپنے خاندان اور دوستوں کی صحتمندی سے مطمئن محسوس نہیں کرتا۔	9
عام طور پر میں چیزوں کو پھیلے سے اچھی طرح پلان کرنے کو ترجیح دوں گا/گی نہ کہ نامعلوم (صورت حال) سے نمٹنے کو۔	عام طور پر میں چیزوں کی اچھی طرح سے منصوبہ بندی کرنے کو ترجیح دوں گا نہ کہ نامعلوم (صورت حال) سے نمٹنے کو۔	10
میں بہت کم اپنے آپ کو باآواز بلند یہ کہتے یا سوچتے ہوئے پاتا/پاتی ہوں کہ میں اتنا اچھا/اچھی نہیں یا کچھ حاصل کرنے کے قابل نہیں ہوں۔	میں بہت کم اپنے آپ کو کہتے یا سوچتے ہوئے پاتا ہوں کہ میں اتنا اچھا نہیں جتنا ہونا چاہیے یا کچھ حاصل کرنے کے قابل نہیں ہوں۔	13
میں اپنے کام اور زندگی کی زیادہ تر تبدیلیوں، مایوسیوں اور دھچکوں کو چیلنج کے طور پر دیکھنے کی بجائے خطرناک، نقصان دہ اور پریشان کن دیکھتا/دیکھتی ہوں۔	میں کام کے زیادہ تر (حصے) زندگی کی تبدیلیوں، مایوسیوں اور دھچکوں کو چیلنج کے طور پر لینے کے بجائے خطرناک، نقصان دہ اور ذہنی دباؤ کے طور پر لیتا ہوں۔	15
اگر مجھے یہ دیکھنے کا موقع ملے کہ دوسروں نے کس طرح کوئی چیز کی یا موقع ملے کہ سیکھا یا جانے کہ کیا کرنا ہے، مجھے یقین ہے کہ میں تقریباً کسی بھی چیز میں کامیاب ہو سکتا/سکتی ہوں۔	اگر مجھے یہ دیکھنے کا موقع ملے کہ دوسروں نے کس طرح کوئی چیز کی ہے یا یہ سیکھنے کا موقع ملے کہ کیا کرنا ہے، مجھے یقین ہے کہ میں تقریباً ہر چیز میں کامیاب ہو سکتا ہوں۔	18
میں یہ توقع رکھتا/رکھتی ہوں کہ چیزیں کبھی کبھار غلط ہو سکتی ہیں مگر اپنے راستے میں آنے والی ہر چیز سے مؤثر انداز میں نمٹ سکنے کے بارے میں میرے ذہن میں کوئی شک نہیں۔	میں یہ توقع رکھتا ہوں کہ چیزیں کبھی کبھار غلط ہو سکتی ہیں مگر اپنے راستے میں آنے والی ہر چیز سے مؤثر انداز میں نمٹ سکنے کے بارے میں میرے ذہن میں کوئی شک نہیں۔	19
اگر میرے پلان میری امید کے مطابق واضح نہیں ہوتے یا چیزیں اس طرح نہیں ہوتیں جیسا میں واقعی چاہتا/چاہتی ہوں تو میں تنگ اور پریشان ہو جاتا/جاتی ہوں۔	اگر میرے منصوبے میری امید کے مطابق واضح نہیں ہوتے، یا اگر چیزیں اس طرح نہیں ہوتیں جیسے میں واقعی چاہتا ہوں تو میں مایوس اور پریشان ہو جاتا ہوں۔	21
میرے محنت سے کام کرنے اور جو کامیابی اور عزت مجھے ملے گی اس میں براہ راست تعلق ہے۔	میرے محنت سے کام کرنے اور جو کامیابی اور عزت مجھے ملے گی اس میں براہ راست تعلق ہے۔	22

<p>میں اکثر سوچتا/ سوچتی ہوں کہ ان لوگوں کی نسبت میں بے ہنر، نااہل، یا کم اہم ہوں جن کے ساتھ میں کام کرتا/ کرتی ہوں اور جن کو جانتا/ جانتی ہوں۔</p>	<p>24</p> <p>میں اکثر سوچتا ہوں کہ ان لوگوں کی نسبت میں نااہل، نالائق یا کم اہم ہوں جن کے ساتھ میں کام کرتا ہوں اور جن کو جانتا ہوں۔</p>
<p>میں محسوس کرتا ہوں کہ اگر ابھی اسی وقت میری زندگی میں کچھ بھی بدل جاتا ہے یا غلط ہو جاتا ہے تو ہو سکتا ہے میں اس سے واقعی ہی نمٹنے کے قابل ہوں۔</p>	<p>26</p> <p>میں محسوس کرتا ہوں کہ اگر ابھی اسی وقت میری زندگی میں کچھ بھی بدل جاتا ہے یا غلط ہو جاتا ہے تو ہو سکتا ہے میں اس سے مؤثر انداز میں نمٹنے کے قابل ہوں۔</p>
<p>آپ اتنے زیادہ لوگوں پر بہت یقین نہیں کر سکتے کیوں کہ زیادہ تر لوگ آپ کو استعمال کر کے اپنی فلاح اور خوشی کے راستے تلاش کر رہے ہوتے ہیں۔</p>	<p>29</p> <p>آپ یقیناً اتنے زیادہ لوگوں پر یقین نہیں کر سکتے کیوں کہ زیادہ تر افراد آپ کو استعمال کر کے اپنی فلاح اور خوشی کے راستے تلاش کر رہے ہوتے ہیں۔</p>
<p>کامیابی کی ظاہری تعریف، حاصل کردہ مقصد اور ذاتی اطمینان کے بجائے زندگی کے زیادہ تر معنی، (آپ کے) اپنے اندر سے آتے ہیں۔</p>	<p>30</p> <p>زندگی کے زیادہ تر معنی، کامیابی، حاصل کردہ مقصد اور ذاتی اطمینان کی بیرونی تعریف کے بجائے انسان کے اپنے اندر سے آتے ہیں۔</p>
<p>اچھا / اچھی دیتا/ دیتی، دیکھتا / دیکھتی، کرتا/ کرتی، سکتا/ سکتی پاتا/ پاتی، جاتا/ جاتی، رکھتا/ رکھتی جانتا/ جانتی</p>	

Letter of Approval



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TO WHOM IT MAY CONCERN

Capital University of Science and Technology (CUST) is a federally chartered university. The university is authorized by the Federal Government to award degrees at Bachelor's, Master's and Doctorate level for a wide variety of programs.

Ms. Arooba Arshad, registration number BSP193045 is a bona fide student in BS Psychology program at this University from Fall 2019 till date. In partial fulfillment of the degree, she is conducting research on "Psychometric evaluation of Urdu version of cognitive hardiness scale in Pakistani context". In this continuation, the student is required to collect data from your institute.

Considering the forgoing, kindly allow the student to collect the requisite data from your institute. Your cooperation in this regard will be highly appreciated.

Please feel free to contact undersigned, if you have any query in this regard.

Best Wishes,

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