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Deliberate Self-Harm and Attachment:
*Mediating and Moderating Roles of Depression, Anxiety,
Social Support and Interpersonal Problems among
Pakistani School Going Adolescents*

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Doctor of Philosophy in Clinical psychology

The University of Edinburgh

2017

Declaration

I declare that this thesis is my own work and it has not been submitted previously for any other degree or professional qualification.

Sabahat Haqqani

September 7, 2017

Date:

Dedicated to

My Son

Who helped me reimagine life

My Mentor

Dr. Farah Qadir

Who is with me even when she is not

To My Parents

Who encouraged me to explore and experience

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Lay Summary

In Pakistan there is dearth of research on deliberate self-harm (DSH) and its predictors among adolescents. Previous research in developed countries indicated that attachment theory can be used as a framework to understand the development of not only psychopathology but also its predictive factors. The dearth of research in Pakistan can be partly attributed to criminalization, sacrilegious status and stigma attached to DSH as well as to paucity of Urdu versions of the standardized psychological instruments are translated into Urdu language as a first step. This is followed by an exploration of pathways of interaction of risk and protective factors leading to DSH within attachment framework by using these Urdu translated instruments. Standardized psychological tests were translated into Urdu language and validated. Data was collected from 1290 adolescents (10-19 years age) by using the translated Urdu versions of the questionnaires and demographic Pro forma Structural equation modelling was used to study the pathways of associations between predictors of DSH. The prevalence of DSH among adolescents was 7%. Two models were constructed to understand the association of attachment with DSH mediated by (1) interaction of social support with depression and anxiety, and (2) interaction of interpersonal relationship problems with depression and anxiety. Taking into consideration specific cultural and demographic background of Pakistan, this study establishes key role of attachment. The results provide evidence for designing awareness and prevention programs. This thesis also provides suggestions for clinical, school and community based awareness programs and policy guidelines for adolescents along with recommendations for future research and application of thesis.

Abstract

Introduction: In Pakistan there is dearth of research on deliberate self-harm (DSH) and its predictors among adolescents. While the lack of research in Pakistan can be partly attributed to the sacrilegious status, criminalization and stigmatization attached to DSH, it is also an attribute of paucity of Urdu versions of the standardized psychological instruments. Previous research in developed countries has indicated that attachment theory can be used as a useful framework to understand the development of austere psychopathologies like DSH, as well as for studying pathways of interaction of interpersonal and intrapersonal factors of psychopathologies. In this study, standardized psychological instruments are translated into Urdu language as a first step. These instruments are then used to study pathways of interaction of interpersonal and intrapersonal factors of DSH, conceptualized within attachment framework.

Method: The study was conducted in two steps. In step 1, Youth Health Risk Behavior Survey (YHRB), Inventory of Interpersonal Problems-32 (IIP-32) and Significant Others Scale (SOS), were translated into Urdu language. Along with these scales, Urdu translated versions of Hospital Anxiety and Depression Scale (HADS), Adolescent Relationship Scales Questionnaire (ARSQ), Life Events scale (LES) from CASE questionnaire and Family Affluence Scale-II (FAS-II) were reviewed for accuracy of translation through expert judgement and psychometric evaluation. Secondly, a cross sectional survey was conducted with 1290 adolescents (10 - 19 years age) using the translated Urdu versions of the instruments and demographic pro forma. Structural equation modelling was used to study the pathways of associations between predictors of DSH.

Results: The extensive process of translation resulted in establishment of semantic, content, technical and construct equivalence of the translated instruments with the original English versions. Multiple imputation was performed to account for missing values in SPSS 20. Important structural adaptations were made in the scales based on factor analyses conducted in M plus. After modifications, all scales showed satisfactory *CFI* (≥ 0.90) and *RMSEA* (≤ 0.06). Results of the survey indicated that the prevalence of DSH (with, without and ambivalent suicidal intentions) was 7%. Two SEM models were constructed involving both mediation and moderation pathways. Results of Model 1 showed association of attachment with DSH was double mediated by social support, depression and anxiety. Model 2 also confirmed association of attachment with DSH with double mediation through relationship style problems, depression and anxiety. In order to understand the contextual picture of the concepts studied in this research both SEM models were also constructed by controlling for demographic factors. This resulted in confirming age, gender and family affluence as significant contributors but with very small effects.

Discussion and conclusion: In the present study translation of the instruments helped in building a reservoir for future research. The results of translation and validation of instruments indicated that cultural differences, language needs and age must be accounted for while using standardized psychological instruments. Taking into consideration specific cultural and demographic background of Pakistan, this study also confirms the key role of attachment in influencing interaction of predictors of DSH. It is suggested that intrapersonal and interpersonal factors are influential points of intervention for designing clinical, school and community based awareness and prevention programs for DSH. The

thesis also discusses the implications for policy guidelines along with recommendations for future research and other applications of the study.

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LIST OF ABBREVIATIONS

| | |
|--------------|---|
| APA | American Psychological Association |
| ARSQ | Adolescent Relationship Scales Questionnaire |
| CASE | Child and Adolescent Self-harm in Europe survey |
| CDC | Centre for disease control and prevention |
| CI | Confidence interval |
| <i>CFI</i> | Comparative fit index |
| Dep | Depression |
| df | Degrees of freedom |
| DSH | Deliberate self harm |
| DSM-V | Diagnostic and Statistical Manual of Mental Disorders fifth edition |
| FAS-II | Family Affluence Scale- II |
| GDP | Gross domestic product |
| HADS | Hospital Anxiety and Depression Scale |
| IIP-32 | Inventory of Interpersonal Problems- 32 |
| K-S | Kolmogorov Smirnov test |
| LES | Life events scale |
| MAR | Missing at random |
| MCAR | Completely at random |
| MI | multiply imputed |
| <i>MLM</i> | Maximum likelihood method |
| NMAR | Not missing at random |
| n.d | No date |
| NOS | Not otherwise specified |
| NSSI | Non-suicidal self-injury |
| OECD | Organization for Economic Co-operation and Development |
| <i>RMSEA</i> | Root mean square approximation |
| RSQ | Relationship scales questionnaire |
| <i>SD</i> | Standard deviation |
| SEM | Structural equation modelling |
| SOS | Social support scale |
| UN DESA | United Nations Department of Economic and Social Affairs |
| UNICEF | United Nations children's fund |
| WHO | World health organization |
| <i>WLSMV</i> | Weighted least squares with mean and variance adjustment |
| YHRBS | Youth health risk behaviors survey |

LIST OF SYMBOLS

| | |
|----------|----------------------|
| χ^2 | Chi-square |
| α | Cronbach alpha |
| M | Mean |
| N/n | Total number |
| n.s | Not significant |
| p | Significance level |
| r | Spearman coefficient |
| R^2 | Variance |
| SE | Standard error |

CHAPTER 1

DELIBERATE SELF-HARM AND ATTACHMENT

AN OVERVIEW OF CORE CONSTRUCTS, THEORETICAL FRAMEWORK AND CONTEXT OF THE STUDY

GENERAL INTRODUCTION

Deliberate self-harm (DSH), both suicidal and non-suicidal, is increasingly being highlighted in research, policy guidelines, media and social platforms (South West Public Health Observatory, 2011). Adolescents are especially considered vulnerable to DSH. It is among the top three causes of loss of life for 10 – 19 years olds (WHO, 2016a). DSH is a multifaceted phenomenon with numerous psychological, social, demographic, biological and cultural risk factors. Among psychosocial risk factors, depression, anxiety, perceived negative life events (Fliege, Lee, Grimm, & Klapp, 2008), interpersonal problems (Stepp, Morse, Yaggi, Reynolds, Reed, & Pilkonis, 2008) and social support (Heath, Ross, Toste, Charlebois, & Nedecheva, 2009) are the key intrapersonal and interpersonal factors (Hawton, Saunders, & O'Connor, 2012). These risk factors have been identified based on the studies conducted in developed countries. There is dearth of research on DSH in developing countries like Pakistan where youth is in higher proportion than the rest of the world, there is a greater resource challenge and burden of youth related health problems

is on the rise (Fatusi & Hindin, 2010). There is need to explore DSH and its correlates among adolescents living in developing countries like Pakistan.

In developmental psychological research, it is believed that all development takes place in interpersonal context; and attachment is one of the most influential factors in determining the course of adolescent's development and behaviors (Cassidy & Shaver, 2008; American Psychological Association, 2002). Attachment theory proposes that in determining the pathways of psychopathologies like DSH attachment in itself cannot serve as a risk factor, it's the interaction of attachment with other factors that determine the pathways to DSH (Greenberg, Speltz, & Deklyen, 1993). To understand the interaction of interpersonal and intrapersonal risk factors for DSH among Pakistani adolescents, this thesis adopts a developmental approach proposed by attachment theory.

In understanding DSH from developmental attachment perspective, context is known to play a significant role (Barker, 2007; Dewi, Halim, & Derksen, 2016; Keller, Spieker, & Gilchrist, 2005). In order to understand the applicability of the attachment theory in Pakistani context one approach can be to consider the influence of contextual factors like age, gender, socioeconomic status and negative life events. The importance of including contextual factors is stressed in attachment theory itself (Cassidy & Shaver, 2008). To understand the theoretical and contextual background of the concepts being studied in this thesis, this chapter will review the state of the art with respect to prevalence and conceptualization of DSH, attachment framework, contextual factors among adolescents, and the state of mental health in Pakistani society.

DELIBERATE SELF HARM

Recent statistics show that deliberate self-harm (DSH) is among the top three leading causes of adolescent deaths (WHO, 2016a). Among adolescents, the average global prevalence rates of DSH (with and without suicidal intent) range from 16.1% to 18% (Muehlenkamp, Claes, Havertape, & Plener, 2012). DSH is not only cause of distress to the individual, family and society, it is also associated with poor personal, interpersonal and educational outcomes, and increase in the burden of health care (Saunders, & Smith, 2016).

It is speculated that DSH has tremendously increased among adolescents in the past few decades (Hawton, Saunders, & O'Connor, 2012). The increase in rate of DSH is not just because of increase in number of individuals engaging in DSH, it can also be an attribute of increase in likelihood of adolescents to seek help for DSH, and an improvement in the ability of health care providers to recognize DSH correctly (The Cornell Research Program for Self-Injury Recovery, 2016). Whatsoever the reason may be, this increase in DSH is alarming especially with respect to adolescents.

Adolescents are at highest risk both in developed and developing regions. Here it must be noted that there is an imbalance in the geographic distribution of research conducted on DSH. As compared to the research done on DSH in developed countries with only 15% of 1.1 billion world's young people (aged between 15 – 24 years), little

work has been done in low and middle income countries where 85% of youth lives (United Nations Department of Economic and Social Affairs [UN DESA], 2004); and there is an easy access to methods of DSH (Fogarty International Centre, 2010; Khan & Reza, 1996). Asia alone accounts for 60% of the youth living in developing region but most of the research done here is limited to hospital samples (UN DESA, 2004) which do not account for the whole population involved in DSH.

In developing countries three million people try to poison themselves every year, approximately 220,000 of them die (Eddleston, Sheriff, & Hawton, 1998). Pakistan, India and Sri Lanka, are the three developing Asian countries that account for world's 10% (more than 100,000) deaths due to DSH (Abidi, Zia, & Waqas, 2010). Self-poisoning with pesticides is the most commonly reported method of DSH in these countries, owing to their easy availability (Eddleston, et al., 2002). No conclusive figures for other forms of DSH are available from these regions. This could be attributed to the fact that of the two subgroups of DSH with respect to type of harm (i.e., self-injury and self-poisoning groups), self-poisoning group is more likely to seek help and report to the hospital (Hawton, Rodham, Evans, & Weatherall, 2002).

The reported rates of fatal DSH are higher in developing countries than developed countries as compared to the rate of non-fatal DSH which is reported to be lower in the developing countries (Hawton, 2004; Vijayakumar, Nagaraj, & John, 2004). Interestingly in developing countries there is an easy access to the means of DSH as no strict regulations are implemented with respect to availability of pesticides, sharp objects (like knives and

blades) and medicine. Plausible explanations for this anomaly could be lack of adequate facilities to deal with such cases, use of more severe methods for DSH (Hawton, 2004; Vijayakumar, Nagaraj, & John, 2004) or only severe cases of DSH coming to medical attention (due to stigmatization) (Khan & Reza, 1996). This calls for further investigation of the situation. However, it is difficult to identify DSH and conduct research on it as only small proportions of DSH population present themselves to hospitals (Fortune & Hawton, 2005). Hence, making it difficult to obtain true prevalence rates through registered cases (Horrocks & House, 2002). This is also complicated by the fact that DSH is conceptualized as immoral, sacrilegious and a criminal act in countries like Pakistan. Hence, these circumstances make DSH an ‘iceberg’ phenomenon where many cases of DSH never approach healthcare settings out of the fear of the stigma and legal consequences (Hawton, Saunders, & O’Connor, 2012). In this situation community based studies seem more plausible.

In world health report equal access to health facilities is emphasized (Vijayakumar, Nagaraj, & John, 2004). In order to ensure this, one approach could be to assess the applicability of already available information across different regions of the world. Such an endeavor will allow to assess the similarities and differences in terms of the patterns of DSH in different regions. It can also point out the applicability of the already available theories and remedies, thus allowing for the modification required in these theories according to the specific circumstances of any particular region. This approach is especially useful for resource constraint settings of developing countries like Pakistan.

Hence, a greater focus of research in developing regions like Pakistan is required along with clarification in conceptualization of DSH.

Apart from limitations imposed by contextual factors (which can be addressed by conducting research within indigenous settings), another important aspect of hindrance in conducting research on DSH is the ambiguity in its nomenclature and conceptualization. It is understandable that different researches conceptualize DSH in different ways and adapt the terminology and conceptualization accordingly; and it seems a cumbersome and time taking task to achieve consensus on this issue. However, before beginning to conduct research it is reasonable to clearly outline whatever terminology and definition will be used in the study in order to allow appropriate comparisons and explore applicability. Therefore, the next section will focus on the suitable criteria for defining DSH and the terminologies used for it. It also discusses applicability of continuum hypothesis for studying DSH.

DEFINING DSH

Different studies have conceptualized DSH from various points of view. Reviews conducted by Welch (2001), and Muehlenkamp, Claes, Lindsey, Havertape and Plener (2012) pointed out that some studies focused on DSH both with and without suicidal intent while others included either only DSH with suicidal intent or without suicidal intent, thus producing widely different rates of DSH. There is also variation in the method of assessing DSH. Some studies used a single question while others used more detailed assessment methods. Some counted number of attempts made in a particular time period while others

recorded the number of individuals involved in DSH without distinguishing the number of attempts made. Often age group and gender specific rates are not calculated (Welch, 2001; Muehlenkamp, Claes, Lindsey Havertape, & Plener, 2012). There are also many studies that do not clearly outline the methods used to explore DSH (Victor & Klonsky, 2014; Gandhi, Layckx, Maitra, & Claes, 2016). All of these variations in research lead to ambiguity. Therefore, it is important to specify what is meant by DSH in the present study in light of the existing evidence.

DSH: TERMINOLOGIES AND DEFINITION CRITERIA

For research a generalizable terminology and a definition that is theory neutral, free of value judgment and culturally normative is essential (De Leo, Burgis, Bertolote, Kerkhof, & Bille-Brahe, 2006). This is required in order to avoid difficulty in acceptance and usage by the researchers adhering to different theoretical perspectives, and the danger of becoming obsolete as soon as the theoretical perspective becomes less popular (De Leo, Burgis, Bertolote, Kerkhof, & Bille-Brahe, 2006). Historically, different terminologies have been used for DSH such as self-harm, self-injurious behavior, repeated self-injury, self-wounding, para suicide, suicide, suicidal behavior, self-mutilation, episodic and repetitive self-injury, intentional self-harm, self-directed violent behavior and auto destructive behavior (Mangnall & Yurkovich, 2008; Gandhi, Layckx, Maitra, & Claes, 2016). As compared to these terms, deliberate self-harm (DSH) carries less negative connotation (Gratz, 2001). Furthermore, it is an umbrella term used by most researches

for both suicidal and non-suicidal DSH (Cloutier, Martin, Kennedy, Nixon, & Muehlenkamp, 2010).

With respect to defining DSH in accordance with the previously mentioned criteria, WHO/EURO Multicenter Study defined DSH on the basis of three distinguishing characteristics: the locus of origin (self), intention and the consciousness/awareness of the outcomes (De Leo, Burgis, Bertolote, Kerkhof, & Bille-Brahe, 2006). Hence, “deliberate self-harm” (DSH) is the terminology used in this study and it is defined as:

Consciously, intentionally, purposefully, with or without intent of dying, self-inflicted acute damage of one’s own body in a culturally unsanctioned manner.

This definition is also helpful to differentiate DSH from other health risk behaviors and mental health disorders. In DSH, the damage to self is acute which makes it distinct from behaviors such as smoking or eating unhealthy diet (Swales, 2005). Similarly, including locus of origin as criteria for defining DSH helps differentiate DSH from injuries due to accidents and homicides. Some researchers consider eating disorders as DSH. However, if the previously mentioned criteria for defining DSH are applied eating disorders are different from DSH in terms of the perception of the act and the functions that they serve. If DSM-V criteria are used for eating disorders, it asserts that in eating disorders the intention is not to harm oneself but to reduce the body weight under the perception of disturbed body shape and weight, without realizing its medical consequences (APA, 2013a). Nevertheless, this is one point of view. There is also research which indicates that eating disorders serve the emotion regulation function, just like DSH

(Svaldi, Griepenstroh, Tuschen-Caffier, & Ehring, 2012; Suyemoto & Donald, 1995). However, this serving of the same function may be an indication of shared underlying risk factors. Hence, in the present study DSH will be considered separate but closely related to eating disorders as both are health risk behaviors (CDC, 2016).

Another aspect that complicates the act of DSH as a separate syndrome is its occurrence as a symptom of other psychiatric and developmental disorders. Yet, it is not particular to one disorder and may not always be occurring in a particular psychiatric disorder (Eisenkraft, 2006). For an act to be considered as DSH an individual must be conscious of the outcome, which might not be the case in psychiatric and developmental disorders (Eisenkraft, 2006) for example, in delirium (Stern et al., 2010) and autism (Weis, 2002). DSH has been repeatedly found to be occurring independently (Zetterqvist, 2015; Moran et al., 2012) and therefore, it will be conceptualized as an independent disorder in this study.

DSH: CONTINUUM APPROACH

An important consideration to be made with respect to research on DSH is intent. Typically with respect to intent, DSH is classified into suicidal and non-suicidal DSH. In DSM-V, two separate categories of DSH have been included as independent syndromes; (1) non-suicidal self-injury (NSSI) and (2) suicidal behavior disorder (Duffy, 2009). Where inclusion of DSH as NSSI and suicidal behavior disorder ensures further research, diagnosis, treatment and rehabilitation for individuals with DSH, it also masks the possibility of certain degree of overlap between the suicidal and non-suicidal DSH. There

is not much empirical evidence available to support the classification of DSH into these straightforward categories (Curtis, 2016). In fact many studies have failed to clearly distinguish DSH with suicidal intent from DSH without suicidal intent (Hamza, Stewart, & Willoughby, 2012). It is possible that individuals may not have full insight of the nature of their intentions (Kapusta, 2012; Hjelmeland et al., 2002). Extant research has also shown that these two behaviors co-occur frequently, despite the fact that they differ in their neurobiology, motivations and treatment response (Brent, 2011). For instance, in a study conducted by Nixon, Cloutier and Aggarwal (2002), adolescent inpatients reported doing NSSI to specifically stop suicidal ideation or actual suicidal attempt (Nixon, Cloutier, & Aggarwal, 2002). More recently, Mars and colleagues (2014) concluded that DSH with and without suicidal intent are overlapping phenomena with some dissimilar characteristics as they share most of their risk factors, with few exceptions. So far, there is no clear evidence for this classification of DSH. Based on the overlap between suicidal and non-suicidal DSH, some studies have suggested that suicidal and non-suicidal DSH might be the parts of the same dimensional construct (Tormoen, Rossow, Larsson, & Mehlum, 2013).

In order to accommodate the overlap between suicidal and non-suicidal DSH and to avoid the pitfall of suicidality exclusion in case of ambiguous intentions, DSH can be hypothesized as occurring along a continuum. (Hawton, & Fortune, 2009). This approach makes the difference between the categories a difference of quality rather than the kind (Tormoen, Rossow, Larsson, & Mehlum, 2013). The continuum hypothesis argues that suicidal ideation, planning, attempt and the actual act of DSH with and/or without suicidal

intentions occur along a continuum (Gandhi, Layckx, Maitra, & Claes, 2016). The evidence for the link between suicidal and non-suicidal DSH can also be drawn from Joiner's theory. Joiner proposed that non suicidal DSH habituate an individual to physical and emotional pain; which increases the future risk for suicide (Joiner, 2005). As noted earlier, the link suggested by Joiner is hardly ever studied beyond the co-occurrence of suicidal and non-suicidal DSH (Andover & Gibb, 2010).

Study of the continuum approach will require asking more than one question about DSH. Here the array of questions can start from hopelessness (explained in next paragraph), suicidal ideation, plan and intent leading to the actual act and injury suffered (CDC, 2016). This approach will accommodate identification of individuals involved in either suicidal or non-suicidal DSH along with those who do not draw a clear distinction in their intents. To understand the continuity in DSH with and without suicidal intent longitudinal studies are required. However, for longitudinal studies excess amount of time and fiscal resources are needed. This is further complicated by ethical concerns regarding follow up of DSH cases. An alternate solution can be to run a factor analysis on all the questions that explore DSH (from hopelessness to the act of DSH). This will allow for understanding whether all these indicators are a part of the bigger concept of DSH or not. However, it will not be able to identify the dimensionality of DSH. Still, it will provide useful evidence for testing continuum hypothesis and progressing the research on DSH by identifying whether a distinction can be drawn between suicidal and non-suicidal DSH (two factor structure) or a more continuous approach is useful (one factor structure).

Now coming to the question of including hopelessness as an indicator of DSH. The presence of hopelessness has been widely researched as a predictor of DSH (Steeg et al., 2016). It is a shared factor between suicidal DSH and non-suicidal DSH with varying levels of intensity (Victor & Klonsky, 2014). Relationship of hopelessness and DSH has theoretical underpinnings in Beck's hopelessness theory of suicide which considered suicidal ideation as a function of hopeless cognitions (Nock, 2014). Beck's theory of hopelessness did not receive much attention due to its inability to account for other factors (Nock, 2014). However, the empirical evidence indicates that hopelessness is one of the strongest predictors of DSH. For example, a 10 years cohort, conducted on 414 psychiatric patients, concluded that hopelessness was so closely linked to DSH that it provided information about suicide risk whether there was a history of attempted suicide or not. (Klonsky, Kotov, Bakst, Rabinowitz, & Bromet, 2012). More recently, hopelessness has been recognized as a necessary element for suicidal DSH without which presence of other elements such as pain (psychological mostly) is insufficient (Klonsky & May, 2015). Systematic review by Hamza, Stewart and Willoughby (2012), and Victor and Klonsky (2014) also showed the seminal importance of hopelessness in DSH. In another longitudinal study, hopelessness was found to predict suicidal thoughts, suicide attempts, and completed suicide. Interestingly it was stronger predictor of suicidal thoughts, suicide attempts, and completed suicide than depression and substance abuse (Kuo, Gallo, & Eaton, 2004). This is suggestive of a very close connection between hopelessness and DSH.

Hopelessness was also considered as a bridging link between depression and DSH, long time ago (Beck, Kavacs, & Weissman, 1975). From the review of the literature it seems hopelessness is an influential part of DSH. Despite the evidence available it has hardly ever been included in the inventories measuring DSH. On the other hand, hopelessness has been widely researched as an indicator of depression for instance, in Beck Depression Inventory-II (Beck, Steer, & Brown, 1996). The unequivocal psychopathological significance of hopelessness for DSH suggests that it must also be tested for inclusion in DSH continuum as an indicator of DSH. Therefore, to study its significance in DSH this study will also include hopelessness as an indicator of DSH.

DELIBERATE SELF-HARM DURING ADOLESCENCE

In recent years, the envisaged rapid increase in adolescent deliberate self-harm (DSH) has raised concerns in Pakistani society, however there is not much evidence available to discern information about the associated factors of DSH in Pakistan (Jordans, et al. 2014). Existing research from other areas of the world has shown that DSH tends to begin during adolescence (Nock, 2014). Adolescent involvement in DSH has been consistently and particularly associated with the experiences related to family and caregiving relationships (Madge et al., 2011; Hawton, Saunders, & O'Connor, 2012). In developmental psychology this caregiving relationship has been conceptualized in terms of attachment theory (Sroufe, Duggal, Weinfield, & Carlson, 2000) Attachment has been conceptualized as a precondition to unhealthy and healthy development (Sroufe, Duggal,

Weinfield, & Carlson, 2000) thus, it can set the context for understanding DSH occurring during adolescence.

Adolescence is characterized as a time period of profound physical, psychological and social developmental changes. Among physical changes, neurological structure and function get more sophisticated; such as, production and function of neurotransmitters (e.g., dopamine) alter throughout adolescence which tends to stabilize as adulthood approaches (Steinberg, 2008; Takeuchi, Matsushita, Sakai, Kawano, Yoshimoto, & Sawada, 2000). Similarly, prefrontal cortex responsible for abstract thinking and problem solving abilities transforms (Spear, 2000). Besides these changes, adolescents go through psychological and social changes. For instance, adolescents tend to spend more time with peers than parents (Larson, Richards, Moneta, & Holmbeck, 1996). The physical and psychosocial changes experienced during adolescence need to be integrated (Moretti & Peled, 2004). This implies that a conflict will be experienced if these changes are not well coordinated and integrated. An example of discordance can be the conflict between the social and parental expectations for being responsible and appropriately assessing risk, and the developing cognitive abilities of problem solving and metacognitions. An attachment perspective of the adolescent development propagates that such conflicts are handled in an interpersonal environment through views about self, and experiences of the world (Gillath, Bunge, Shaver, Wendelken, & Mikulincer, 2005). However during adolescence, this interpersonal context is itself going through transition. As adolescents expand their social circle they tend to spend more time with peers than parents which leads to a dilemma of maintaining connection with parents, exploring new social roles, and

developing attachment with peers (Steinberg, 2008). The evolution of attachment during adolescence results in perception of attachment figure as symbolic and an individual characteristic as compared to the childhood's attachment that is more physical/ biological (Dubois-Comtois, Cyr, Pascuzzo, Lessard, & Poulin, 2013). Thus during adolescence, to balance the need to spend time with peers, to invest in peer attachment and simultaneously maintain contact with parents, physical proximity becomes less important but the trust, availability and accessibility of attachment figure in times of need becomes central demand of the attachment system. This allows adolescents to move further away from attachment figure to explore environment, personal ideas and emotional states, and form new social relationships with peers and/or romantic partners. Hence, in adolescence attachment act as a guide for their behaviors, thoughts and stress regulation strategies (Dubois-Comtois, Cyr, Pascuzzo, Lessard, & Poulin, 2013).

It is important to point out here that the successful transition is contingent on the integration of the new attachment experiences with the old ones, into a general model. This general model of attachment can then serve as a prosperous ground to facilitate further changes. However, if the changes experienced during adolescence are not well integrated, they set the context for psychopathologies (Cassidy & Shaver, 2008; Moretti & Peled, 2004). Furthermore, the transactional and nonlinear nature of developmental pathways (Sroufe, 2005) suggests that where early experiences (such as interaction between parents and child) direct the unique path of development, the probabilistic nature of attachment emphasizes the importance of studying attachment states of mind at all stages of life. Hence, attachment must be considered as a cumulative experience at a

particular stage of life, along with current stressors and experiences (Sroufe, Egeland, Carlson, & Collins, 2005). As attachment patterns initialized in childhood continue to develop throughout life, a certain style of attachment is already present in adolescence and this predisposition interacts with the developing skills which in turn enables adolescents to revise their internal working models. It means that attachment is both distal and proximal in nature, and inclusion of attachment in models studying developmental psychopathologies will provide more predictive power.

DELIBERATE SELF HARM AND ATTACHMENT THEORY

Attachment theory proposes that disruptions in attachment are responsible for deterioration of mental health. From the point of its conception, this idea has been verified in various studies (for example, Palitsky, Mota, Afifi, Downs, & Sareen, 2013; Glazebrook, Townsend, & Sayal, 2015). However, it still remains to be understood exactly how attachment influences various mental health disorders. For instance, is attachment insecurity a general or specific vulnerability factor for specific disorders like DSH? Does it influence DSH directly or its effect is mediated through other psychological constructs? So far, existing literature shows that disruptions in attachment influence many adverse mental health outcomes such as depression, anxiety and DSH (Jinyao, Xiongzhaoh, Auerbach, Gardiner, Lin, Yuping, & Shuqiao, 2012; Glazebrook, Townsend, & Sayal, 2015). In order to understand the link between attachment and development of austere psychopathologies like DSH, it is important to understand how attachment system works and how its components are linked with DSH and other factors.

Therefore, the next section will outline the basic tenants of attachment theory in relation to DSH.

KEY COMPONENTS OF ATTACHMENT THEORY

The basic tenants of attachment theory can be summarized into four key components. Firstly, infants have innate behavioral system called attachment behavioral system. Secondly, the quality of interaction with the primary caregiver determines the individual differences in the development of this behavioral system. Thirdly, these individual differences in attachment behavioral system can be organized into four styles of attachment. Lastly, the interactions with the primary caregiver are internalized in the form of cognitive representations called working models of self and other (Cassidy & Shaver, 2008). These models of self and other serve as a basic framework for operating in the world and they influence an individual's mental, emotional and behavioral states (Bifulco & Thomas, 2013). These four key components and how they are related to DSH will now be evaluated in detail.

ATTACHMENT BEHAVIOURAL SYSTEM AND DSH

According to attachment theory, attachment behavioral system consists of survival behaviors which are motivated by instincts to retain or regain contact with the attachment figure in threatening situations and to increase the chances of survival. As the survival need continues throughout life, the attachment behavioral system continues to exist in adolescence and adulthood. However, the behavioral manifestation of this attachment

system evolves with time to meet the needs of the individual. For example, for adults the behavior of crying and clinging is replaced by talking to and seeking advice from the attachment figure in times of threat (e.g. in terms of social support) (Cassidy & Shaver, 2008).

Attachment theory hypothesizes that attachment behaviors facilitate the formation and maintenance of attachment bonds and have a profound influence on an individual's functioning. For instance, in case of problems in the attachment behavioral system a problematic manifestation of behaviors will occur. Mikulincer and Shaver (2012), and Levy and colleagues (2006) noted that as a result of hyper activation of attachment behavioral system, anxiousness, feelings of desolation, impulsivity and DSH occur. Thus, problems in attachment behavioral system are manifested through both emotional and behavioral domains of mental health. This brings attention to the need to understand development of attachment system. A crucial factor in development of the attachment system is quality of interaction with the attachment figure as it serves as a vehicle for evolution of attachment behavioral system (Shaver & Mikulincer, 2009).

QUALITY OF INTERACTION WITH THE ATTACHMENT FIGURE AND DSH

The working mechanism of attachment system is established through the quality of interaction with the attachment figures (Shaver & Mikulincer, 2009). Attachment figure is someone who provides safety, care, support, protection and is empathetic and responsive. In childhood, these attachment figures are usually parents or other primary caregivers. In adulthood these figures can be parents, partners, close friends or close

family members (Bifulco & Thomas, 2013). The interaction with these attachment figures develops into a general attachment system that influences an individual's future interactions and support seeking strategies (Cassidy & Shaver, 2008). For instance, it is well established that responses of parents (acting as attachment figures) influence attachment styles. Karavasilis, Doyle and Markiewicz, (2003) found that warm parental involvement, psychological autonomy granting and behavioral monitoring by parents were positively correlated with secure child-mother attachment among 414 children and adolescents (ages 4 -11 years). On the other hand, negligent parenting resulted in maladaptive patterns of attachment system.

This proposition is also supported by theories of DSH such as, interpersonal/systemic theory and Joiner's (2005) interpersonal psychological theory. In case of interpersonal/systemic theory, the dysfunction in family or environmental system surrounding the individual leads to DSH. Empirical data based on case studies suggests that DSH is a maladaptive act of communication that is used to provoke responses in the environment/ family (Klonsky, 2009). The way the family (i.e. attachment figures) responds may unknowingly supports or reinforces the maladaptive attachment response, expressed in terms of DSH (Klonsky, 2009). Here, DSH is a maladaptive attachment behavior that is produced to seek out attachment figure in times of need/ stress.

Similarly, Joiner (2005) proposed that the need to belong (termed by Bowlby as having secure base/ attachment) and make useful contribution to one's social circle is imperative for healthy existence. In this respect, Lester and Gunn (2012) examined 664

suicide notes and concluded that the need for belongingness was evident in 42.5% cases and perceived burdensome was present in 15.5%. Thus, the role of attachment figure in development of DSH is empirically revealed here as need to belong and perceived burdensomeness. An important concern that arises here is how this interaction with attachment figure develops into an operational system that is mobilized in threatening situations. Attachment theory has also proposed this operational system.

According to attachment theory, in instances of threat, attachment system mobilizes the individual to escape from risk towards an attachment figure (i.e., primary attachment strategy). In case of reliable caregiver, primary attachment strategy will be successfully implemented. But in case of frightening caregiver, the child is confronted with a paradox; the concurrent need to draw near to and get away from the caregiver. Maltreated child will experience “fright without solution” (Hesse & Main, 1999, p. 484) which will lead to disintegration in behavioral coping strategies for stress. The child will then turn to secondary attachment strategies; hyper activation or deactivation of attachment system (Cassidy & Shaver, 2008). These primary and secondary attachment strategies can be categorized into four attachment styles which will be discussed in the next section.

ATTACHMENT STYLES AND DSH

Over time, repeated experiences with attachment figures develop into four styles of attachment (Cassidy & Shaver, 2008). (1) When an individual experiences the caregiver as available and reliable in the event of stress, and self as loved and valued, secure attachment style is developed. He/she is able to rely on others in times of stress. (2)

Whereas, when a person experiences the caregiver as distant and emotionally unavailable during stress periods and self as not distressed by turning attention away from distress, he/she gets uncomfortable with close relationships. This results in development of avoidant attachment style. (3) Similarly, a person with preoccupied attachment style experiences the caregiver as supportive and self as distressed. Such an individual desires close relationships and fears that others will not be as close to oneself as one desires. (4) Finally, when a caregiver is considered as unreliable and self as reliable, low dependence and high avoidance of others results i.e., dismissive attachment style (Cassidy & Shaver, 2008).

It is well recognized that secure attachment style is related with better mental health and insecure attachment styles are associated with various mental health issues (Mikulincer, & Shaver, 2012; Ozer, Yildirim, Erkoç, 2015; Daniel, Mota, Affifi, Down, & Sareen, 2013). For instance, in a population based study ($N= 5692$) conducted in US, it was found that secure attachment styles protected against all mental health issues including depression, anxiety and suicide. Whereas, insecure attachment styles predicted occurrence of depression, anxiety and suicidal DSH (Daniel, Mota, Affifi, Down, & Sareen, 2013). Although, the study claimed to be the first to establish attachment as general vulnerability factor in US population, it failed to trace the exact course followed by a particular attachment style for a particular disorder.

In an attempt to figure out which attachment style served as vulnerability to a particular kind of disorder a recent meta-analysis conducted by Sheri, Laura, Vanessa,

Leslie and Karlen (2015) concluded that avoidant, ambivalent, and disorganized styles were all associated with internalizing behaviors and only disorganized style was associated with externalizing behaviors. Similarly, another meta-analysis concluded that both avoidance and disorganization were significantly associated with increased externalizing problems whereas, internalizing problems were associated with avoidance. (Fearon, Bakermans-Kranenburg, Lapsley, & Roisman (2010); Groh, Roisman, van IJzendoorn, Bakermans-Kranenburg, & Fearon, 2012). With respect to DSH, this implies that all kinds of attachment insecurities make an individual vulnerable to DSH. These meta-analyses provided much needed information about specific styles being associated with two major classifications of mental health problems but it still remains to be understood what underlying mechanisms are involved in association of specific attachment styles with specific mental health concerns.

This need to look into more continuous mechanisms laying foundations for the four attachment styles is also supported by the disagreement regarding classification of attachment style into four groups. Data collected from 1,139 infants (15 month old) indicated that variation in attachment patterns was continuous (Fraley & Spieker, 2003). The study results urge that attention must be paid to the mechanisms behind the four attachment styles.

With respect to underlying mechanisms if composition of attachment style is looked into, it can be deduced that attachment styles develop on the basis of cognitions about self and others. Bowlby proposed that these cognitive mechanisms drive the evolution of

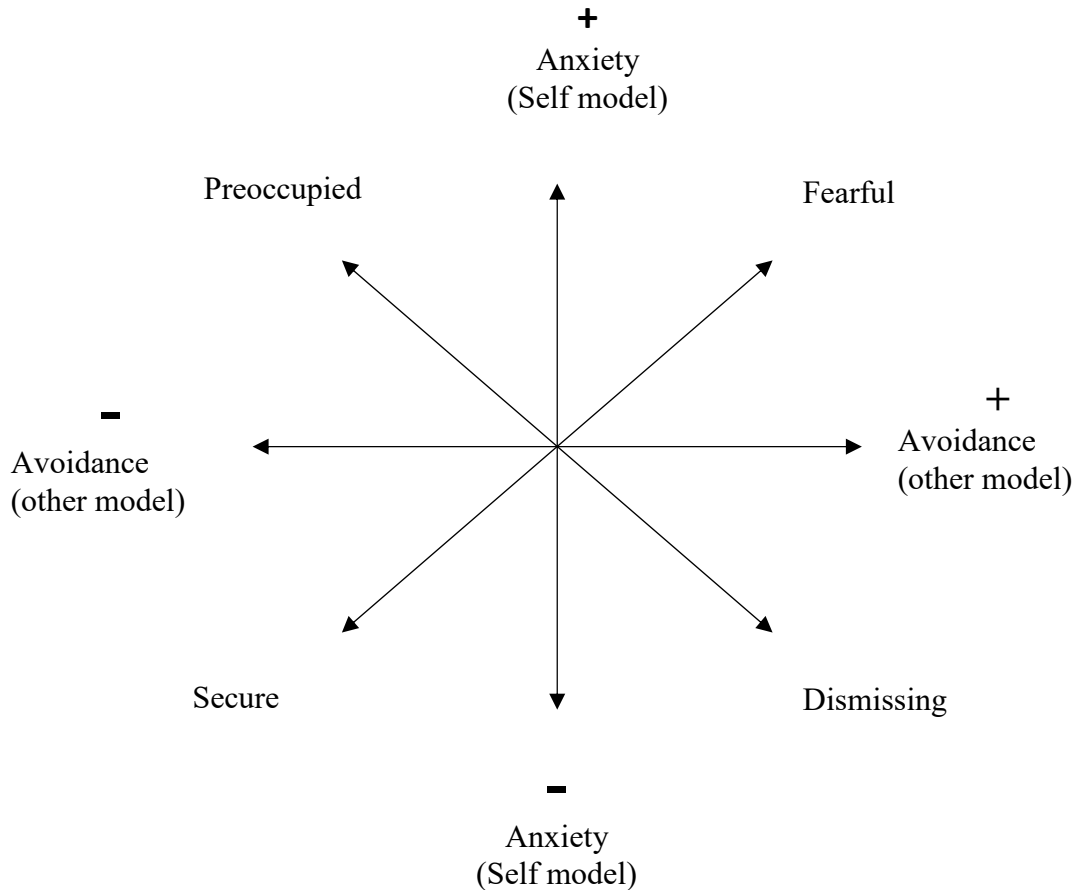
attachment behavioral system into attachment styles (Berry, Danquah, & Wallin, 2014). They also provide blue print for operating in different situations. Hence, it seems more reasonable to look at the blue prints of attachment in relation to development of psychopathology. The nature and mechanisms through which the models of self and other operate and how they are useful in understanding DSH will be discussed in the next section.

WORKING MODELS OF SELF AND OTHER, AND DSH

According to attachment theory, children develop internal working models that form the basis for their future attachment relationships and constitute expectations of self (self model), and others and self in relation to others (other model) (Cassidy & Shaver, 2008). In some studies, working models of attachment were defined by two dimensions of attachment: anxiety (self model) and avoidance (other model). These are two independent dimensions that underlie attachment style classification and are translated into the previously mentioned four attachment styles as shown in the following figure (Shaver & Fraley, 2010).

Figure 1. 1

Diagrammatic presentation of four attachment styles, and self and other models of attachment.



Source: Shaver, P. R., & Fraley, R. C. (2010). Self-report measures of adult attachment. Retrieved <http://internal.psychology.illinois.edu/~rcfraley/measures/measures.html>

The congruence between theoretical conceptualization of self and other model and their empirical measurement has been under debate. According to Shaver and Fraley (2010), instead of self and other model terms anxiety and avoidance seem more applied because they are closer to the manifest content of the items used to measure attachment as

their conceptual relevance to cognitive models of self and other is still subject to study. However, empirical evidence for conceptual relevance and construct validity of self and other model has been generated long time ago. Griffin and Bartholomew (1994) studied construct validity of self and other model through series of studies, multi-trait multimethod matrices and confirmatory factor analysis (CFA). The study conceptually established self model and other model in second-order model consisting of four lower-order factors of the four attachment prototypes, namely, secure, fearful, preoccupied and dismissing. However, the study used Relationship Questionnaire which has only one item to measure each attachment style and makes the validity of this instrument debatable. More evidence has been generated to support constructs of self and other models of attachment by using multi item questionnaire. For instance, in a recent study on Chinese population ($N=385$, 18-64 years age) Attachment Style Questionnaire (24 items reduced to 15 in CFA) was used to measure the internal working models of self and other as second order latent constructs. The questionnaire items were loaded onto four attachment styles which were further loaded onto self and other model. Both self and other model showed independence from each other and significantly contributed to the lower order factors (attachment styles) (Chui & Leung, 2016). This indicates that the self and other model are the underlying factors of the four attachment styles. Moreover, the terms self and other model are more neutral in nature and are more representative of the full range of cognitions about self and others extending from negative to positive. Therefore, in the present study, terms self model and other model will be used as they were used historically in attachment research; as they showed good construct validity in empirical studies; and as they are closer representations of what is being measured in research on attachment theory.

Now in order to understand the association of attachment with DSH, it is also important to understand how internal working models develop and operate. The internal working models are developed or deformed based on experiences and interactions with attachment figures. For instance, if a child fails to find the behavior of attachment figure contingent with one's own internal state, it creates anxiousness for that child. When a child is seeking for reflection of self in others (i.e. self in relation to others), appropriate mirroring helps the child to internalize experiences as part of self. Whereas, inappropriate interaction with attachment figures let the child experience ideas and feelings as part of the self that do not seem to belong to the self (i.e. alien self) (Fonagy & Bateman, 2007). Those individuals whose working models of self and other are not fully coherent and are structured with elements of alien self and alien other, may need to use different strategies to restore coherence of their sense of self. For instance, in Scoliers, Portzky, Madge, Hewitt, Hawton, de Wilde, and van Heeringen's (2009) study, DSH was described by adolescents (14-17 years old) as a desire to get relief from a terrible state of mind. Moreover, Mikulincer and Shaver (2007) considered DSH as an extreme anxious hyper activation of attachment system which is used to achieve social benefits like sympathy and care. Here the alien aspect of the self might be externalized to an attachment figure (Fonagy & Bateman, 2007). DSH through representing anger, guilt or protest against alienation brings avoidant deactivation of attachment system and hence, acts as a compensation mechanism (Zeyrek, Gencoz, Bergman, & Lester, 2009). According to Fonagy and Bateman (2007) such actions are not self-protective as the aim is not to get rid of the feelings that a person cannot concede; on the contrary as the disjointed elements have a capacity to generate far deeper anxiety, the aim is to shield self from realizing

experiences that are incoherent with the overall structure of self but embedded within the self (Fonagy & Bateman, 2007).

The association of attachment (in terms of self and other model) with DSH has been verified empirically in many recent studies. Braga and Goncalves (2014) concluded that among 518 university students, those currently engaging in non-suicidal DSH reported higher attachment anxiety (negative self model) and avoidance (negative other model) as compare to past deliberate self-harmers. The study showed the association of models of attachment with DSH but the criteria used for defining current and past deliberate self-harmers was ambiguous. The study collected information about DSH at two time points; the last month (past DSH group) and last week (current DSH group). According to Cooper and colleagues (2005) the risk of repetition is high within six months of first DSH attempt. Therefore, the group classified as past deliberate self-harmer cannot really be considered as past deliberate self-harmer group. Thus, the study can only verify the presence of link between negative self and other model. More recently Claes, Rudi, Magali and Guy (2016) reported similar findings with respect to mother as an attachment figure. In this study university students with negative other model were more likely to communicate less with mothers and engage in non-suicidal DSH. Having a negative other model is suggestive of reluctance to seek out attachment figures in times of need as individuals with negative other model fear intimacy and dependence. However, this study also has two important limitations one of which is small sample size ($N=42$). The other is that it explored non suicidal DSH only; and only with respect to attachment with mothers.

Negative other working model may be especially detrimental when an individual is experiencing stress (Mikulincer & Shaver, 2007). The difficulty in reaching out significant others can lead to further detachment, and alienation, which in turn may result in increased DSH (Levi-Belz, Gvion, Horesh-Reinman, & Apter, 2013), as suggested by interpersonal theory of suicidal DSH. Joiner's interpersonal theory of suicidal DSH (2009) suggested that thwarted belonging serves as one of the necessary conditions for DSH in which associations with valued individuals/groups become ineffective. With respect to attachment theory, these thwarted connections can be considered similar to negative other model. As compared to Joiner's theory, attachment theory provides much more explanation as it also includes intrapersonal domain in terms of self model along with explanations for evolvement of these models during adolescence and throughout life.

Thus, it seems reasonable to understand DSH among adolescents by using attachment theory as a framework. Attachment is also known to be associated with other predictors of DSH which can be broadly classified into intrapersonal and interpersonal predictors. Among intrapersonal predictors, attachment has been found to be linked with depression and anxiety, the closest relatives of DSH (Kidger, Heron, Lewis, Evans & Gunnell, 2012; Brunner, Parzer, Haffner, Steen, Roos, Klett and Resch, 2007; Hawton, Rodham, Evans, & Weatherall, 2002; McMahon, Reulbach, Corcoran, Keeley, Perry, & Arensman, 2010). Attachment is also known to be associated with interpersonal predictors like social support (Tresno & Mearns, 2016) and interpersonal relationship problems (Andersen & Chen, 2002). What remains to be discovered is that whether these relationships are moderated or mediated (details presented in chapter 5 and 6).

THEORETICAL FRAMEWORK

Attachment theory proposes that unreliable and insensitive attachment figures induce insecure and unstable attachment states of mind that reduce a person's ability to effectively deal with stress and thus it predisposes to psychopathologies. It serves as a general vulnerability factor to mental disorders (Mikulincer & Shaver, 2012; Cassidy & Shaver, 2008). Where, attachment is considered as a general risk factor for psychopathologies, particular types of attachment insecurities can be linked with general divisions of psychopathologies (Mikulincer & shaver, 2012; Cassidy & Shaver, 2008; Fearon, Bakermans-Kranenburg, Lapsley, & Roisman, 2010; Groh, Roisman, van IJzendoorn, Bakermans-Kranenburg, & Fearon, 2012). Contemporary theories propose that where attachment is a general significant contributor to psychopathology the particular developmental pathway is determined through interaction with other psychosocial, contextual and biological factors (Mikulincer & Shaver, 2012). Despite this recognition in the theory, most of the studies did not specifically considered the pathways resulting from the interaction of attachment, psychosocial and contextual factors resulting in specific developmental pathways. Furthermore, the research conducted up till now studied association of attachment styles with varying outcomes and only few studies focused on internal working models. As mentioned earlier in the literature review, attachment has two building blocks, self and other models that result from interaction with attachment figures. These internal representations form the basis of attachment style and provide the blue print for attachment behavioral system. They also guide an individual's mental state and interpersonal interactions. Owing to their formative significance,

studying their interaction with other intrapersonal and interpersonal factors will help in understanding DSH from a developmental perspective.

The literature reviewed so far supports that disruptions in attachment experiences lead to alien self and alien other. These alien self and alien other exist in all the individuals as all individuals have experienced absence of receptivity from attachment figure to a greater or lesser extent (Fonagy & Bateman, 2007). The question that arises here is that if everybody experiences this disintegration in self and other models what leads some of them towards psychopathology. Perhaps this is where the role of other intrapersonal and interpersonal factors and their interaction with attachment comes into play. The review of literature also establishes that the working models of attachment interact with adolescents' exploration of the environment and act as a template for their emotional, social and behavioral reactions. To elaborate, the working models of attachment attribute support to mental state of an individual by working in the background of the mind while lending coherence and psychological meaning to that individual's behaviors. However, again an important task that needs to be understood is the exact pathway of interaction.

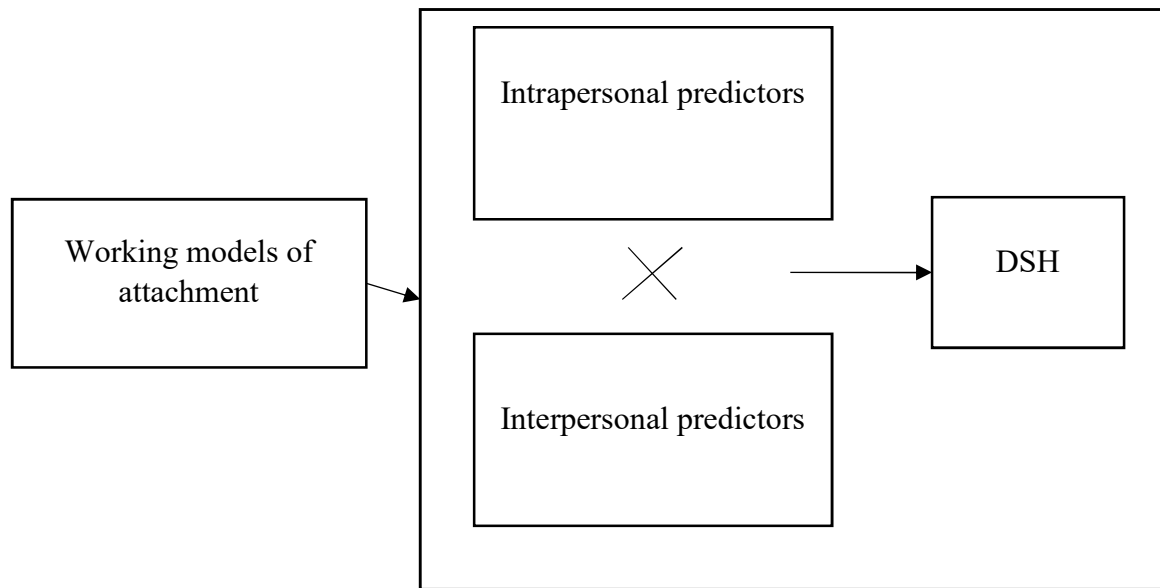
With respect to pathways of interaction, each model of attachment has a distinctive significance for interpersonal and intrapersonal factors. Self model consisting of cognitions about value and worth of self, is thought to be more linked to intrapersonal domain such as regulation of emotions (Bifulco & Thomas, 2013). On the contrary, other model (consisting of cognitions about others and self in relation to others) is thought to be more interpersonal in nature and may be feeding more into concepts like social support.

However, the overall picture is more complicated than this proposed basic map. As attachment by its nature takes place in an interpersonal context, the concept of self develops within interpersonal context (Bifulco & Thomas, 2013). Thus, the link between self model and resulting mental states is possibly mediated/moderated by interpersonal contexts. For instance social support influencing depression (Chioqueta & Stiles, 2007). Thus, it seems that not only interpersonal and intrapersonal factors are influenced by attachment, they also interact with each other.

Therefore, the present study used the theoretical framework of attachment theory and tested developmental pathways from interpersonal and intrapersonal risk factor to DSH. Attachment theory suggests that attachment states of mind influence all other factors including perception of social support, interpersonal relationship style problems, depression, anxiety and DSH. However, it needs to be determined what pathways are followed in this regard and how these psychosocial factors interact. The following figure presents a general diagrammatic illustration of the proposed model resulting from combination of attachment theory and interpersonal and intrapersonal factors to predict DSH.

Figure 1. 2

Diagrammatic illustration of the theatrical framework.



From the existing literature it seems problems in working models of self and other not only result in development of insecure attachment but also generate specific mental states and behaviors by acting as a growth medium for maladaptive responses that prevent the corrective actions and encourage psychopathological developments (Bifulco & Thomas, 2013). Therefore, it is hypothesized that the working models of attachment system will act as corner stone and will influence interpersonal and intrapersonal risk factors, DSH and their interaction. It is assumed that where problematic attachment will serve as a general vulnerability factor, a specific combination of all these factors can predict DSH.

The aim of this model is to establish whether this interaction between working models of attachment, interpersonal concerns and intrapersonal issues occurs through moderation or mediation; and whether mediational interactions are partial or full. For this purpose two main models are conceptualized; first involving attachment, social support, depression, anxiety and DSH (elaborated in chapter 5) and second is built by using attachment, interpersonal relationship style problems, depression, anxiety and DSH (elaborated in chapter 6). Furthermore, each of these models was also tested for influence of contextual factors.

CONTEXTUALIZATION OF THE THEORETICAL FRAMEWORK

Bowlby's conceptualizations of attachment focused on infancy and childhood in which attachment was studied mainly as a bond between mother and child (Bowlby, 1988). The concepts proposed by Bowlby for infants and children later on proved to be encompassing adolescence and adulthood as well (Mikulincer & Shaver, 2007). During the last few decades, attachment theory has been recognized as one of the most influential conceptual frameworks for understanding adaptive and maladaptive development around the world (Cassidy & Shaver, 2008). What remains to be ascertained is whether the concepts proposed by attachment theory withstand the contextual differences or not, that is whether attachment is universal or context dependent.

In regard to possible contextual influences on attachment, some studies indicate that attachment vary with respect to various demographic and social factors (Dewi, Halim,

& Derksen, 2016; Keller, Spieker, & Gilchrist, 2005) whereas, others assert the universality of attachment (Hazan & Shaver, 1994). According to Bornstein (2012), psychological concepts and processes like childrearing can be universal and at the same time they can be culture specific. For instance, parents nurture and protect their children in all societies (Bornstein, 2006). Such similarities reflect universals even though they vary in their level of quantity and quality among various cultures (Bornstein, 2012). Bornstein, Cote, Haynes, Suwalsky and Bakeman (2012) studied the similarities and differences in 118 Japanese, Japanese American and European American Dyads of mothers and infants (5.5 months old). The study found similarities in person-oriented behaviors of infants and mothers for all cultural groups, and difference in object-oriented behaviors of infants and mothers. The parallels found in this study might be a reflection of inherent attributes of parenting and caregiving or a by-product of globalization (Bornstein, 2012). Another study conducted on German ($N=310$) and Indian ($N=300$) mothers and their adolescent children (14- 17 years old) showed differences in attachment of German and Indian mothers and their adolescent children. German mothers were more accepting and less controlling than Indian mothers. Whereas, Indian mothers and adolescents showed more avoidance than the Germans. Indian adolescents showed more anxiety than German adolescents (Albert, Trommsdorff, & Mishra, 2007). Although it seems that there are significant differences in general patterns of attachment in different cultures, the successful administration of same instruments in different settings, and the effective comparisons drawn from such studies show the universality of broad attachment dimensions. It is this universality of patterns proposed in attachment theory which propagates that globally internal working models of attachment are formulated through

interactions with significant others and these models influence individuals' current and future social relationships throughout life (Sroufe & Fleeson, 1986).

Apart from universality of attachment in itself there is another dimension of contextualization that must be considered in studying attachment; that is interaction of the universal components of attachment with other contextual factors. Greenberg, Speltz and Deklyen (1993) proposed that in determining the pathways of psychopathology attachment in itself cannot serve as a risk factor, it's the interaction of attachment with biological, familial and social factors that determine the pathways to psychopathology. This interactional process is also recognized by the attachment theory itself. Attachment theory views numerous stressors as threat to attachment security. Such as threatened or actual loss of a significant other, denunciation, desertion, conflict and other interpersonal stressors (Bifulco & Thomas, 2013). These factors can also be collectively termed as negative life events. These negative life events are considered as factors that interact with attachment to produce psychopathologies (Bifulco & Thomas, 2013). Apart from these negative life events, Greenberg, Speltz and Deklyen (1993) proposed biological/ personal factors (such as age and gender) and familial factors (such as family affluence or socioeconomic status of the family) to be important moderators of attachment in determining pathways to psychopathology. Moreover, these factors are also known to be important predictors of DSH (Liu, Frazier, Cataldo, Simon, Spirito, & Prinstein, 2014; Welch, 2001; Hilt, Cha, & Nolen-Hoeksema, 2008). Therefore, in the following sections the contextual role of age, gender, family affluence and negative life events will be discussed in relation to attachment and DSH.

1. NEGATIVE LIFE EVENTS AS A CONTEXTUAL FACTOR

Personal illness, illness or death of a close person, valuable things stolen, problems with police and termination of a relationship due to marital conflict, serious problems with a close friend or relative, are all sources of distress in daily life (Brugha, Bebbington, Tennant, & Hurry, 1985) and are collectively termed as negative life events. They have been repeatedly found to be associated with negative mental health outcomes (e.g. Friis, Wittchen, Pfister, & Lieb, 2002; Maciejewski, Prigerson, & Mazure, 2000). They also play an important role in potentially irreversible negative outcomes such as, DSH. In a study, conducted by Bagge, Glenn and Lee (2013) on 110 adult recent suicidal DSH attempters, a timeline follow back methodology was used by exploring the occurrence of negative life events in the last 48 hours prior to DSH. In this study, interpersonal negative life events served as a trigger for suicidal DSH. This study explored the relationship of different negative life events that were related to family, peer or other interpersonal domains but research has shown that a single event may not be perceived as distressing as the accumulation of several negative life events (Jackson & Finney, 2002). The additive effects of negative life events was studied by Liu, Frazier, Cataldo, Simon, Spirito and Prinstein (2014). The study concluded that higher rate of negative life events was associated with DSH without suicidal intent and depressive symptoms ($N= 110$ adolescent inpatients). The data were collected at three time points for a period of nine months. In this study, life stressors acted as a precipitant in the occurrence of DSH. The study provided evidence for the additive effect of negative life events but like most other studies

it included only cases with non-suicidal DSH. Thus, there is need to understand how negative life events interact with increasing level of DSH.

Life events serve as turning points that can play crucial role in determining life trajectories (Pancer, Hunsberger, Pratt, & Alisat, 2000). According to Jackson and Finney (2002), in the absence of proper guidance, if a life stressor occurs (such as rejection by social club) it may lead to depressed mood and a decision to restrict availing opportunities for progression. All these observations support the attachment conceptualization of negative life events. Attachment theory purports that the pathway of attachment experiences is shaped by significant life events (Cassidy & Shaver, 2008). In the absence of any significant life event attachment system will continue into adulthood with the same quality (Bowlby, R., 2008). Nevertheless, in real life all individuals are bound to experience certain significant life events that alter their conceptualizations of self and others. Some of these experiences are positive and interact with attachment system to strengthen the models of self and other. Whereas, others are negative and their interactions with self and other models of attachment result in weakening of attachment system and development of psychological vulnerabilities which then can lead to psychopathology (Cassidy & Shaver, 2008).

Attachment theory has placed so much importance on negative life events that it has considered them as the most influential interacting factor in determining the pathways to psychopathology (Cassidy & Shaver, 2008). The relationship between negative life events and development can be explained in terms of the experience dependent development

proposed by attachment theory (Cassidy & Shaver, 2008). During early years of life the brain areas responsible for stress related coping develop (i.e., limbic system in cortex and sub cortex) and the early interpersonal stressful events have enduring effects on their development. Therefore, the significant life experience dependent development of brain areas is responsible for later reactions and evolution of cognitive models of attachment (Malekpour, 2007). This development tends to be atypical when negative life experiences interact with attachment system of an individual. For instance, Cozzarelli, Karafa, Collins, & Tagler (2003) concluded in a longitudinal study ($N= 442$ women) that although attachment styles demonstrate stability across time, a person's history of abuse or psychological problems, life events and cognitions about self and others interact and serve as a vulnerability to psychopathology. Hence, negative life events are important markers for understanding pathological consequences (such as, DSH) as a result of their interaction with attachment.

2. AGE AND GENDER AS CONTEXTUAL FACTORS

Age and gender serve as vulnerability factors for psychopathologies. Many psychological disorders begin during childhood and adolescence. Adolescents are at an increased risk of affective, conduct, psychotic and anxiety disorders (Park, Bang, & Kim, 2014). With respect to DSH, several studies indicated that age and gender are the two most important markers for DSH worldwide (Welch, 2001). DSH usually first begins in adolescence (Nock, 2010). According to Hawton and Harriss (2008), DSH peaks around 16 years of age among adolescents. Similarly, another study by Hawton, Bergen, Kapur,

Cooper, Steeg, Ness and Waters (2012) on 10-18 years old adolescents concluded that DSH repetition increases with age.

The association of age with psychopathology can also be effectively understood in developmental framework which accentuates that normative development should be considered as a crucial factor in determining problems during adolescence (Kendall & Comer, 2010; Rutter & Sroufe, 2000). As stated in earlier section on DSH in adolescence, developmental psychopathology perspective dictates that adolescents go through biological, psychological, and social developmental stages that make them more prone to psychopathologies. With increasing age adolescents go through changes in social roles that may be perceived as challenging, puzzling, or arduous. The increased contact with peers, friendship changes, heightened parent– child conflict, and increased sex-role socialization are a few examples. The simultaneously occurring cognitive (e.g., changes in prefrontal cortex (Peper & Dahl, 2013)), neural (e.g., dopamine levels (Steinberg, 2008)) and hormonal changes (e.g., related to puberty) increase adolescents' sensitivity to social influences. As stated earlier, if these changes are not well integrated with each other, they tend to lead to psychological difficulties over time (Drabick & Kendall, 2010). The developmental changes typically associated with chronological age make age an important predictor for understanding psychopathologies. The pattern of developmental changes observed during adolescence also imply that there might be a pattern of psychopathological symptoms that can be observed with respect to age. There are many studies that reported low wellbeing and higher depression and anxiety among adolescents (e.g., Steptoe, Deaton, & Stone, 2015; Springer, Pudrovska, & Hauser, 2011; Khalid,

2015; Chopik, Edelstein, & Fraley, 2013). For instance, Chopik, Edelstein and Fraley (2013) conducted a study on 18 to 70 years old 86,555 internet respondents (71.8% female). It was concluded that attachment anxiety decreased more readily with increasing age and attachment avoidance was lower in younger and older adults as compared to middle aged adults. With increasing age changes experienced during adolescence tend to settle down therefore if all goes well, decrease in attachment anxiety and increase in wellbeing is expected. Chopik, Edelstein and Fraley's (2013) results highlighted the important role of age in attachment however, they have been drawn on the basis of adult sample which was predominantly female. Despite theoretical evidence from developmental perspective there is paucity of studies that include changes with respect to age within the adolescence period.

Gender is another contextual factor that serves as a predictor of psychopathologies. Several studies on DSH signposted gender as an important marker for DSH worldwide (Welch, 2001). Studies on adolescent population showed that DSH occurs approximately three times more frequently in female adolescents than males (O'Connor, Rasmussen, Miles, & Hawton, 2009; Hawton, Rodham, Evans, & Weatherall, 2002; O'Connor, Rasmussen, & Hawton, 2010; Fortune & Hawton, 2005). In Pakistan there are no community based studies that focused particularly on adolescents. However, a study conducted on adult patient population suggested female gender as a risk factor for DSH (Shahid & Hyder, 2008). Females are also considered more prone to depression and anxiety (WHO, 2016b; Qadir, Khan, Medhin, & Prince, 2011). In comparison to all other

mental health problem, females report depression most frequently (Piccinelli & Homen, 1997).

The increased vulnerability of females to psychopathologies is grounded in the differential access males and females have to various resources (WHO, 2016b). Apart from socioeconomic factors, the significant explanatory power of gender with reference to differential susceptibility and exposure to risks factors and mental health outcomes is grounded in biological, physical, cognitive, and emotional differences between males and females (Zahn-Waxler, Shirtcliff, & Marceau, 2008). Zahn-Waxler, Shirtcliff and Marceau (2008) suggest that the culturally reinforced feminine stereotype is responsible for promoting behaviors such as dependence, compulsion to perform in relationships, emotionality, helplessness, passivity, and self-sacrifice which are conjectured to generate risk for depression (Zahn-Waxler, Shirtcliff, & Marceau, 2008). This hypothesis supports developmental framework and reinforces importance of considering gender as an important contextual factor due to specific characteristics associated with specific gender roles within a particular society. The empirical support for gender related factors can be found in studies conducted by Nolen-Hoeksema and Girgus (1994), and Nolen-Hoeksema (2012) which identified various risk factors that are more common in females including “low instrumentality, low dominance, low aggression and a tendency to dwell on problems. Thus, it is imperative to consider both age and gender as contextual factors within developmental framework of attachment.

3. SOCIOECONOMIC STATUS AS A CONTEXTUAL FACTOR

Socioeconomic status is an aspect of the environment in which children develop and thus, it is likely to influence their development (Pampel, Krueger, & Denney, 2010). Attachment theory and the developmental framework purports that as a first step in successful development a child's basic needs (e.g., food, cloths, lodging and health) must be met in order for the psychosocial needs to be addressed (Bifulco & Thomas, 2013; Li, Naar-King, Barnett, Stanton, Fang, & Thurston, 2008). If these needs are difficult to meet or are not met at all such as, in case of low socioeconomic status they become a source of stress. Thus, from attachment perspective low socioeconomic status is considered as a stressor that can lead to psychopathology. This suggests that stress paradigm is embedded in attachment theory. As a stressor, low socioeconomic position is a source of adversity. It drenches the capacity of an individual to cope effectively; as those who are economically deprived, face a variety of chronic stressors in their daily lives including continuous struggle to earn enough to meet their basic needs and fewer opportunities for achieving positive goals (Pampel, Krueger, & Denney, 2010; South & Krueger, 2010). Due to these basic associated characteristics, merely being in a low socioeconomic group can make an individual more prone to psychopathology.

With respect to the socioeconomic status and psychopathologies, studies report mixed findings. Young, van Beinum, Sweeting and West (2007) concluded that no significant association existed between socioeconomic status and DSH among 18-29 years old individuals in Scotland ($N = 1258$). On the other hand, Hilt, Cha and Nolen-Hoeksema

(2008) concluded that lower socioeconomic status is associated with DSH among adolescent girls ($N = 94$, 10–15 years old). Similarly, for depression and anxiety low socioeconomic status is considered as a vulnerability factor (Lorant, Deliege, Eaton, Robert, Philippot, & Ansseau, 2003; Green & Benzeval, 2013; Salami & Walker, 2014). On the other hand, McLaughlin, Costello, Leblanc, Sampson and Kessler (2012) concluded that socioeconomic status is not a significant predictor of mental disorders. Thus, the contribution of low socioeconomic status as a stressor in an individual's life needs to be explored in order to ascertain its role from developmental and attachment based perspective.

PROFILE OF RESEARCH SITE: PAKISTAN

In the present research it has been purported that context serves as an important factor in determining psychopathology. Context plays two different roles in psychopathology. The first one is specific role in which specific contextual factors influence the pathways to psychopathology through their interaction with behaviors, affect and/or cognitions of individuals (Steinberg & Avenevoli, 2000). This role is elaborated in preceding sections on contextualization of theoretical framework. The second role is nonspecific in nature and is more concerned with understanding the general conditions in which psychopathology exists and is researched. It has implications for understating research outcomes and designing interventions based on these outcomes (Bukonya, Hickey & King, 2012). It is with respect to this second role of context that the profile of the research site will be explained in this section.

COUNTRY PROFILE

Pakistan is a developing Muslim country located in South Asia with 185.1 million population (48.6% females) (The World Bank, 2016). It is the sixth most populous nation in the world (Population Reference Bureau, 2015). The geographical location of the country is next to Afghanistan, Iran, India, Bangladesh and Russia. Urdu is the lingua Franca of Pakistan; however most of the official written communication is done in English. Other main languages used in the country are Punjabi, Sindhi, Siraiki, and Pashtu

(WHO, 2009). The main ethnic group of Pakistan is Punjabi. Other ethnicities include Sindhi, Siraiki, Pashtun, and Muhajir (WHO, 2009).

Pakistan is a low middle income country with important strategic position in South Asia and huge potential for growth and development (The World Bank Group, 2016). At the time of independence (1947) Pakistan was an agricultural country. In the past, 53% of GDP (gross domestic product) was contributed by agriculture as compared to 24% contribution of agriculture now-a-days. Agriculture got replaced by the service sector which contributes up to 50% in total GDP (Lashari, 2004). The literacy rate is 62% for males and 37.5% for females. The percentage of the health finance in GDP is 3.9. The healthy life expectancy at birth for men is 54 years and 52 years for women. There are about 85 general physicians and one hospital bed per 100,000 individuals (WHO, 2009). As compared to other developing countries in the region including India, China, Bangladesh Nepal, Bhutan, Iran and Sri Lanka, Pakistan's health and social indicators are fairly poor. For instance, ranking of Pakistan on Human Development index declined from 138 to 144 out of 175 countries in 2003 as compared to ranking of India and Bangladesh which increased to 127 and 139, correspondingly (Lashari, 2004).

In the past, the social and cultural set up of the country provided a strong familial network for informal care and counselling for the growing children and adolescents. Family used to serve as the first resource for care and nurturing in Pakistan (Mohmand & Gazdar, 2007) but due to demographic transition this set up is experiencing alterations. The hunt for better employment, increased movement of females into working sector,

migration to urban area for better education and employment opportunities, and nuclear family trends have resulted in demographic evolution that changed the previous social network and a need has arisen to explore emerging risks and alternative protective factors (Afridi, 2008).

STATE OF MENTAL HEALTH

As stated in the previous section, Pakistan is in the middle of demographic and social transition which extends to transit into epidemiology of mental health (Akram & Khan, 2007). According to the calculated figures, almost 59% of the total burden of disease is accounted by non-communicable diseases, including injuries (The World Bank, South Asia Human Development & Health, Nutrition, and Population, 2011). Little empirical research has been published on mental health in local peer reviewed journals and very little in international journals (Gadit, 2006). The general picture presented in the literature paints a disconsolate scenario of mental disorders. The average prevalence of anxiety and depression in the community is 34%, ranging from 29% to 66% for women and 10% to 33% for men (Mirza & Jenkins, 2004). This high rate of mental distress is a risk for increased DSH. Research has indicated that over 90% of those who committed suicide were experiencing mental health issue at the time of death (Bertolote & Fleischmann, 2002b).

National rates of suicidal and non-suicidal DSH are neither known nor reported in Pakistan. In the national annual mortality statistics, rates of deaths due to suicidal and non-suicidal DSH are not included (Khan, 2007).

PAKISTANI ADOLESCENTS AND THEIR MENTAL HEALTH

Adolescents (10-19 years old), a human resource asset, constitute almost 22.3% of the total population (UNICEF, 2015). This percentage of youth in Pakistan can be a prospective demographic advantage. However, there is critical challenge to provide adequate care and services to this reserve which needs paramount attention (The World Bank Group, 2016).

In Pakistan, adolescents are facing serious challenges ranging from malnutrition and violence to poor access to health facilities. Girls are especially affected as conservative attitudes impede their growth and access to facilities (UNICEF, 2015). Despite the increased vulnerability of adolescents, there are only 38 dedicated facilities for children and adolescents out of the total 3729 outpatient mental health facilities (WHO, 2009).

In the current trend of the social change experienced by adolescents, psychological issues including anxiety and depression are increasing (Mandil, Hussein, Omer, Turki, & Gaber, 2007; Anjum, Ahmed, & Ashfaq, 2008; Khalid, 2015) and newspaper reports speculate that DSH is on the rise in adolescents. The prevailing situation concerning mental health poses a serious challenge to development of the Pakistani adolescent population and its overall productivity and progress.

DSH IN PAKISTAN

In Pakistan, a developing Islamic country, characteristics of DSH are not well researched and are limited to hospital samples and police reports (Zakiullah et al., 2008; Khan & Reza, 1996; Khurram & Mahmood, 2008; Farooq, Majeed, Bhatti, Khan, Razzak, & Khan, 2010). The little research done shows that 1.12/100,000 deaths were due to DSH from 1998 to 2001. The peak incidence rate was in 20 - 29 years in males and 10 - 19 years in females (Saeed, Bashir, Khan, Iqbal, Raja, & Rehman, 2002). Two years analyses of newspapers showed that men outnumbered women in fatal DSH. There is 2:1 male to female ratio of completed suicides in Pakistan (Vijayakumar, Nagaraj, & John, 2004). Evidence suggests increase in cases of DSH with and without suicidal intent in last few years (Shahid & Hyder, 2008).

It is worth noting that Islam has clear religious sanctions against suicide but there are no clear principles against non-suicidal and non-fatal DSH (Abidi, Zia, & Waqas, 2010). Despite this vagueness, like many other Islamic countries DSH is a criminal offence in Pakistan (Khurram & Mahmood, 2008; Khan, 2007). An individual who dies because of fatal DSH is not allowed to be buried with religious rites. The religious belief that DSH with suicidal intent is a sin, leads the family of victim to be shunned from the community (Krug, Dahlberg, Mercy, Jwi, & Lozano, 2002). Moreover, management of DSH patients at public hospitals incorporates police involvement, “from whom everybody in this country wants to stay away” (Khurram & Mahmood, 2008; Shahid & Hyder, 2008). Many patients are taken to private hospitals which do not record such cases as DSH cases,

in order to save the victim and the family from distress (Khan & Reza, 1996; Krug, Dahlberg, Mercy, Jwi, & Lozano, 2002). There is also considerable stigma to seeing a psychiatrist which prevents many DSH cases from consulting psychiatric services (Khan & Reza, 1996; Shahid & Hyder, 2008).

These circumstances led to DSH being under studied, underreported and under diagnosed, especially in adolescent population. In 2009, an attempt was made to collect data on DSH from adolescent community population. Due to stigmatic, sacrilegious and criminal offence status of DSH, most of the institutes refused to participate in the study. However, it is noteworthy that once permission was sought from the institute the refusal rate decreased greatly at the respondents' level (Mustaqeem, 2009). Due to access issues most of the studies on adolescents focused on ideations and planning of DSH (e.g., Shaikh, 2014). Shaikh (2014) found rate of suicidal ideation and planning of DSH (with/ without suicidal ideation) to be 3.3% and 7.4% respectively among Pakistani school going adolescents ($N=5185$). In the absence of conclusive figures for mental health issues along with unmet needs of adolescent population, there is dire need for mental health research in Pakistan.

RATIONALE

There are several pragmatic and theoretical tenacities behind conceptualization of this study. Firstly, studies envisaging high rates of DSH in Pakistan are abundant and general information on suggested remedies can be easily found, but direct empirical evidence for prevalence rates and correlates is scarce (Shahid & Hyder, 2008; Khan & Reza, 1996). Most of the evidence is gathered from hospital samples, police and newspaper reports (Zakiullah et al., 2008; Khan & Reza, 1996; Khurram & Mahmood, 2008; Farooq, Majeed, Bhatti, Khan, Razzak, & Khan, 2010). It is unclear whether these results can be generalized to the community population, as most of the cases do not come to clinical attention, owing to the taboo status of DSH (Khan & Reza, 1996; Krug, Dahlberg, Mercy, Jwi, & Lozano, 2002; Shahid & Hyder, 2008). Even within this scarce evidence most of the published work focused on estimation of rates in hospital samples, speculation of higher rates in community and very few paid attention to correlates of DSH. Moreover, keeping in view that adolescents constitute around 1/4 (The Population Council, 2009) of the total population, the dearth of research on Pakistani adolescents' mental health is appalling. The urgency in the need for research on Pakistani adolescents becomes stark in the unavailability of national mental health figures and the sociocultural context of the country. Hence, a need for studying mental health of Pakistani adolescents especially DSH can be identified here.

Secondly, as it is evident from the studies discussed in the introduction and literature review, most of the evidence informing the research work done in this study is emerging

from studies conducted in Western countries, where there is much less stigma attached to mental health issues like DSH. The limited evidence presented here shows that DSH has highly sacrilegious, criminal and socially unacceptable status in Pakistan. Therefore, the rationale for this study is also supported by the fact that the current theoretical and empirical literature presented in this chapter provide important foundations, but the subject of this thesis must be investigated within the local social context in which adolescents reside, so as to explore generality of existing evidence.

Furthermore, in continuation with the second reason and with respect to attachment, most of the research conducted on attachment is conceptualized within Western settings where the main aim of the development and care giving is to encourage individual psychological autonomy. Whereas, in different cultures caregiving varies in the models of autonomy and relatedness (Keller, 2013). For instance, in Pakistan during adolescence the focus of attachment is not as much on autonomy as it is on relatedness. Again this can be accommodated by conducting research within indigenous settings however, this is complicated by the fact that non-Western countries are mostly developing countries where there is scarcity of resources. In this situation, one approach could be to assess the applicability of already available information across different regions of the world by using standardized measures. Such comparisons will allow to assess the similarities and differences as well as the applicability of the already available theories and remedies, thus allowing for the modifications/ additions required in these theories according to the specific circumstances of any particular region. This approach is especially useful for resource constraint settings, like Pakistan.

Lastly, the interaction between various intrapersonal and interpersonal predictors of DSH can be studied within attachment framework, due to its ability to provide explanation for both positive and negative outcomes; and its capability to act as a corner stone by effecting not only DSH but also its other predictors. It must be noted here that attachment insecurity is not considered as a psychopathology in itself but a predisposition. It also implies that attachment insecurity alone does not account for mental disorders. Attachment research, since its conception, has focused on establishing its role in various psychopathologies (Cassidy, Jones, & Shaver, 2013). There is little evidence of how it interacts with other predictors of psychopathologies, especially in case of DSH. Contemporary views of attachment have recognized the interaction of working models of attachment with current stressors but it has not been established whether these interactions involve mediation or moderation processes for DSH in Pakistan. Therefore, this study will focus on studying the predictors of DSH in Pakistan within attachment framework.

OBJECTIVES

Following are the objectives of this study.

- 1) Keeping in view the scarcity of resources and the need to measure the concepts in a way that is internationally comparable, this study also aims to translate and validate standardized psychological instruments into Urdu language.
- 2) To explore the occurrence of DSH among Pakistani school going adolescents in the present research.
- 3) To determine through structural equation modelling, how the occurrence of DSH is associated with attachment and a range of intrapersonal, interpersonal and demographic factors.

RESEARCH QUESTIONS

Following research questions were formulated in the present study.

1. What is the reliability and validity of Urdu translated psychological instruments?
(Chapter 4)
2. What is the rate of DSH in this sample of Pakistani school going adolescents?
(Chapter 4)
3. (a) Is the relationship between DSH and attachment mediated or moderated by social support, depression and anxiety? (Chapter 5)

(b) While controlling for age, gender, socioeconomic status and life events, is the relationship between DSH and attachment mediated or moderated by social support, depression and anxiety? (Chapter 5)

4. (a) Is the relationship between DSH and attachment mediated or moderated by interpersonal relationship style problems, depression and anxiety? (Chapter 6)

(b) While controlling for age, gender, socioeconomic status and life events, is the relationship between DSH and attachment mediated or moderated by interpersonal relationship style problems, depression and anxiety? (Chapter 6)

CHAPTER 2

METHODS

In order to fulfil the aims of the study, Urdu translated versions of the standardized psychological instruments were administered on adolescents through a cross sectional survey. In this chapter, a description of the sample and research instruments, and procedures regarding ethical considerations, access to the sample, and administration of the survey are presented. Details of the procedures employed for translation and psychometric evaluation (reliability and factor analyses) of the instruments are presented in the next chapter.

ETHICAL CONSIDERATIONS

Keeping in view the ethical codes of conduct recommended by APA (2003), information sheet and consent forms were prepared. Approval of the study from the concerned authorities was also obtained.

APPROVAL OF THE STUDY

Ethics approval was obtained from the ethics committees of the University of Edinburgh, Scotland and Fatima Jinnah Women University, Pakistan to collect data from two cities, one suburban area and one village. For one city (6 schools), permission was

taken from the Directorate of Education and school heads through Fatima Jinnah Women University. For the other city, and suburban and rural area schools, permission was taken directly from the school heads. Field contacts facilitated obtaining permission from the school heads.

FIELD CONTACTS

Field contacts play a crucial role in research especially in researching sensitive issues. Keeping this advantage of using field contacts and highly sacrilegious, criminal and stigmatic status of DSH, this study took extra precautionary measures to ensure increased cooperation at the institutional level. Thus, besides formal approval of the study, personal access to a wider range of schools was ensured through use of the field contacts. This was done to gain the trust of the institute and ensure credibility of the researcher.

INFORMATION SHEETS AND CONSENT FORMS

Information sheets and consent forms were prepared in accordance with APA code of ethics (APA, 2003) and approved by ethics committees. Adolescents, their parents and school principals were provided with written information about the purpose of the study, and their roles and rights. Adolescents were also informed that they can choose to not answer any question that they do not want to answer. They were also provided with information about other mental health services freely available in Pakistan. Written permissions on consent forms were obtained from school principals and/ or parents/ guardians and adolescents.

SAMPLE

Data was collected from all those institutes that agreed to participate ($N = 1420$). Adolescents were recruited from 8 urban (2 city areas), 2 suburban and 2 rural areas secondary schools. All schools were single-sex schools (5 being single-girls and 6 being single-boys). All schools were state owned schools except for one private urban area school ($N=4$). For schools having different sections within one class level, the sections were randomly selected with the help of Microsoft Excel software.

SAMPLE SIZE

As indicated in the literature review, there is dearth of studies on DSH in Pakistan. To the best of our knowledge, at the time of the sample size calculation there was no published study that explored prevalence of DSH in Pakistan. This is particularly true for school going adolescents. Among the studies conducted in Western societies on school going adolescents, O'Connor, Rasmussen, Miles and Hawton (2009) used a sample size of 2008 in Scotland. This allowed for detection of 13.8% DSH. In England, Hawton, Rodham, Evans and Weatherall (2002) took a sample size of 6020 which resulted in detection of 13.2% DSH. Morey, Corcoran, Arensman and Perry (2008) took a sample size of 3881 in Ireland and found life time rate of DSH to be 9.1%.

The aim of all these Western studies was to determine the prevalence rates of DSH along with correlates, for which larger sample sizes were required. The present study only aimed to explore the correlates of DSH. Since no community studies on DSH among

Pakistani school going adolescents were found at the time of sample size calculations, these Western studies were used as a guide. A small effect size was selected for sample size calculations. Small effect size was used as a caution to ensure that the sample size is adequate enough for detection of DSH among Pakistani school going adolescents. Thus, a minimum sample of 800 to 900 was calculated in G power 3.0 using a priori analysis for multiple regression. This sample size was calculated using 11 predictors for an effect size of 0.02, with 80% power, 0.05 alpha, and 95% confidence interval.

The sample size calculation for structural equation modelling (SEM) is a complex procedure and is still being developed owing to the huge number of factors influencing SEM (Westland, 2010). Most of the research indicated a ratio of at least 10 observations per indicator, 5 observations per parameter estimate or 15 observations per predictor (Bentler & Chu, 1987; Stevens, 2002). According to Division of Statistics + Scientific Computation, The University of Texas at Austin (2012), SEM is closely related to multiple regression in many respects and similar sample sizes can be used for both types of analyses. Hence, the estimated sample size for regression analysis can also be adequately used for SEM.

INCLUSION CRITERIA

Following is the inclusion criteria used in this study:

- 1) Being adolescent and present on the day of study. Adolescence was defined according to chronological age of 10-19 years (WHO, 2015a).

- 2) Signed individual and institutional/ parental/ guardian consent form.
- 3) Ability to understand and respond to the questionnaire in either Urdu or English language (ability as reported by the adolescents).

EXCLUSION CRITERIA

Following exclusion criteria was used in this study:

- 1) No signed individual and institutional/ parental/ guardian consent form.
- 2) Being younger than 10 years of age or older than 19 years.
- 3) Inability to understand and respond to the questionnaire in either Urdu or English language (inability as reported by the adolescent).

INSTRUMENTS

A battery of following self-report questionnaires was administered.

1. DEMOGRAPHICS

Demographic information about age, gender, education level, relationship status, parental/ guardian current occupational status and negative life events was obtained through questions adopted from Child and Adolescent Self-harm in Europe survey (CASE). CASE questionnaire is an anonymous questionnaire and is modified version of Life style and coping scale. It was developed through extensive piloting in schools and in an adolescent psychiatric unit, by group efforts of experts in school-based studies

(O'Connor, Rasmussen, & Hawton, 2009). The Urdu version of the questionnaire was translated by Mustaqeem (2009).

Information about religion, nationality and perceived Urdu and English language proficiency was obtained through questions borrowed and translated from Scotland census 2011. Questions about family system and diagnosed physical and mental health conditions were formulated and included in the questionnaire. Socioeconomic status was measured through following scale.

Family Affluence Scale (FAS-II)

Previous research has indicated that adolescents are not always able to provide accurate information about socioeconomic status (SES), even though they are aware of the concept of socioeconomic inequalities (O'Neil, 2003; Boyce, Torsheim, Currie, & Zambon, 2006). They cannot report accurately about their parental education, occupation and income (Jensen & Jensen, 2002; Backett-Milburn, Cunningham-Burley, & Davis, 2003). However, relative measures of SES proved to be useful tools for providing information by using proxy indicators of SES (Currie, 2001). Keeping this difficulty in view, the Family Affluence Scale (FAS-II) was used to measure SES in addition to questions about parental/ guardian current occupational status. Family Affluence Scale is specifically designed to measure SES of adolescents. It asks questions that adolescents are more likely to know about their family (i.e., car and computer ownership, own bedroom and travelling for holidays). It consists of four items scored on three point ordinal scale (0, 1, 2). Total score of 0 - 2 indicates low affluence, 2 - 5 indicate medium affluence and

6 - 9 indicate high affluence (Boyce, Torsheim, Currie, & Zambon, 2006). FAS-II scores have good criterion validity with national GDP. The spearman rank correlation between GDP and composite scores of FAS-II was found to be 0.87 in multi-country analyses involving 35 countries (Boyce, Torsheim, Currie, & Zambon, 2006). Among Chinese adolescents (aged 11 and 15 years) this scale showed moderate internal reliability ($\alpha = 0.58$) and moderate external validity ($r_s = 0.48 - 0.51$ ($p < 0.001$)) with other SES indicators (parental education level and perceived family wealth). (Liu, Wang, Villberg, Torsheim, Tynjala, Lv, & Kannas, 2012). An Urdu translated version of the scale by Khalid (2015) was used in the present study.

2. YOUTH HEALTH RISK BEHAVIOR SURVEY (YHRB)

Seven items from Youth Health Risk Behavior Survey (YHRB) were used to measure DSH. YHRB is designed to measure the prevalence of health risk behaviors in high school students, frequency of these behaviors over time, and their co-occurrence. The questionnaire was prepared by Centre for Disease Control and Prevention (CDC). The 2011 national version, used in this study, is the result of several revisions and extensive piloting in large high school samples. CDC allows and provide guidelines to revise the questionnaire according to national and site priorities (Brener et al., 2004). The questionnaire was translated into Urdu language for the present study.

3. ADOLESCENT RELATIONSHIP SCALES QUESTIONNAIRE (ARSQ)

Adolescent Relationship Scales Questionnaire (ARSQ) (Scharfe, 1996) is a 17 item self-report measure rated on 5 to 9 point Likert scale. In this study, 5 point scale (not like me = 1 to very much like me = 5) was used. It has four sub scales: secure (5 items), fearful (4 items), preoccupied (4 items) and dismissing (5 items). For scoring purposes, average of all the items corresponding to each type of attachment is obtained. It provides continuous measure of each attachment style. In ARSQ, item 5, 7 and 17 are reverse scored (Scharfe, 1996). Scores for the underlying two attachment dimensions (self and other models) which are being utilized in this study can be calculated by using the following equations.

$$\text{Self Model} = (\text{secure} + \text{dismissing}) - (\text{fearful} + \text{preoccupied})$$

$$\text{Other Model} = (\text{secure} + \text{preoccupied}) - (\text{fearful} + \text{dismissing})$$

This scale is an adaptation of Griffin and Bartholomew's (1994) 30 item relationship scales questionnaire (RSQ $\alpha = 0.79$ for each subscale (Scharfe and Eldredge (2001))). All the items corresponding to the four types of attachments are similar in RSQ and ARSQ. However, there is a difference between phrasing of certain items in order to adapt them to be used with adolescents. Moreover, ARSQ excludes some of the items included in RSQ that were adopted from the measures developed by Hazan and Shaver (1987), and Collins and Read (1990). An Urdu translated version of the scale was used for the present study.

4. SIGNIFICANT OTHERS SCALE (SOS)

It is a self-report inventory developed by Power, Champion and Aris, (1988). It provides an opportunity to name and rate each source of social support separately on 8 items. Four items correspond to perceived actual support and 4 to perceived ideal support. In the present study, all items were rated on a three point Likert scale (1 = never to 3 = always). In SOS the respondent rates the practical and emotional social support received from up to as many significant relationships as one wants. For each of these types of support and for each named individual, the actual and ideal level of support is also rated and a discrepancy score can be obtained. High discrepancy scores show greater level of inconsistency between respondent's perceived ideal support level and perceived actual support level. The scale has shown good test-retest reliability (0.73 - 0.83) and criterion related validity (Power, Champion, & Aris, 1988). For criterion validity three groups were formed on the basis of scores on General Health Questionnaire; non cases ($N = 34$), non-depressed cases ($N = 27$) and depressed cases ($N=15$) (Goldberg & Hillier, 1979). As compared to the non-depressed cases and non-cases (i.e., completely symptom free), the depressed cases showed higher scores on ideal emotional and practical support, and discrepancy between emotional and practical support. In the present study, an Urdu translated version of the scale was used (Khalid, 2015).

5. INVENTORY OF INTERPERSONAL PROBLEMS-32 (IIP-32)

It is a shorter form of original 127 item Inventory of Interpersonal Problems. It consists of 32 items, rated on 5 point Likert scale (0= not at all to 4= extremely) (Horowitz,

Alden, Wiggins, & Pincus, 2000). It was developed for screening purposes. It helps in detecting kinds of interpersonal relationship style problems that are most significant in various interpersonal situations. It has 8 subscales: (1) domineering/ controlling, (2) vindictive/ self-centered, (3) cold/ distant, (4) socially avoidant/ inhibited, (5) non-assertive, (6) over nurturant/ over accommodating, (7) exploitable/ self-sacrificing, and (8) intrusive/ needy. Each subscale consists of 4 items. Barkham, Hardy and Startup (1996) suggested that the short version sacrifices little compared to the original 127 item version in terms of its psychometric properties while being considerably more convenient for administration. For original 127 item instrument, internal consistency ranged from 0.82 to 0.94 for each subscale. The test-retest correlation was 0.98 for complete scale and 0.81 to 0.90 for each subscale (Horowitz, Rosenberg, Baer, Ureno, & Villasenor, 1988). The scale was translated into Urdu.

6. HOSPITAL ANXIETY AND DEPRESSION SCALE (HADS)

It consists of 14 items; 7 for anxiety and 7 for depression. Developed as a screening tool by Zigmond and Snaith in 1983, it is rated on four point Likert scale (0 = hardly at all to 3 = definitely). Item 7 corresponding to anxiety subscale is reverse scored. Similarly, items 2, 4, 6, 12 and 14 corresponding to depression subscale are also reverse scored. In various studies Cronbach's alpha for anxiety subscale was found to be ranging from 0.68 to 0.93 (mean 0.83) and for depression subscale from 0.67 to 0.90 (mean 0.82) (Bjelland, Dahl, Haug, & Necklemann, 2002). This scale has been internationally used with both patients and general population (Herrmann, 1997; White, Leach, Sims, Atkinson, &

Cottrell, 1999; Bjelland, Dahl, Haug & Necklemann, 2002). The scale has also been validated for use with adolescents with test-retest reliability of 0.62 for depression and 0.74 for anxiety (White, Leach, Sims, Atkinson, & Cottrell, 1999).

Criterion validity of depression subscale was established by using outpatient non-depressed group, outpatient depressed group, DSH patients and school children. Highly significant differences between groups were found ($F = 26.8, p < 0.001$), with depressed group showing higher reliability score than the non-depressed group ($t = 3.49, df = 46, p < 0.001$). For anxiety subscale four groups were used: outpatient group with no emotional disorder, outpatient group with emotional disorder, DSH patients and school children. Highly significant between group differences were found ($F = 15.4, p < 0.001$), with emotional disorder group scoring significantly higher than the group with no emotional disorder ($2.64, df = 46, p < 0.011$) (White, Leach, Sims, Atkinson, & Cottrell, 1999). Hence, this scale successfully differentiates between adolescents with depression or anxiety from those without it.

Factor analysis of HADS showed mixed findings with some factors loading onto both depression and anxiety and some loading either onto depression or anxiety (Cosco, Doyle, Ward, & McGee, 2012). An Urdu translated version of the scale by Mumford, Tareen, Bajwa, Bhatti and Karim (1991) was used.

TRANSLATION AND ADAPTATION OF INSTRUMENTS

The translations into Urdu language and cultural adaptations were done for Inventory of Interpersonal Problems-32, Significant Others Scale, Youth Health Risk Behaviors Survey, demographic questions for family system, and diagnosed physical and mental health conditions. Translations of Hospital Anxiety and Depression Scale, Life Events Scale and demographic items from CASE questionnaire were available in Urdu language. Translated versions of Family Affluence Scale – II, Adolescent Relationship Scales Questionnaire, and demographic items from Scotland census 2011 were obtained from a parallel study on adolescents by Khalid (2015). Details of the translations and psychometric evaluation are presented in chapter 3.

FIELD WORK

Field work was done from 23th January 2012 to 24th February 2012, between 8 am to 5 pm (as two evening shift schools were also included in the sample). Eleven females and four male volunteers helped in administration of the survey. Their education level was from higher secondary school certificate to graduation level. A training manual was prepared for them and they were given 1 hour training to orient them to the administration of the survey. Based on the findings of the pilot interviews and pilot survey, a list of alternative instructions, most frequently asked questions and commonly used meaning of words was given to them (see appendix for research assistants' administration manual).

INSTITUTIONAL, PARENTAL AND PARTICIPANT CONSENT

A total of 18 schools were contacted for participation in the study. Five schools refused to participate in the study and one school stopped the survey during administration stating that they changed their decision regarding the exposure of their students to such sensitive questions. In four schools, parental consent was obtained from the parents directly by the researcher. Parental consent form and information sheets were handed to the pupils in the schools a day before survey administration. This strategy to obtain parental consent had significant impact on the sample size. Out the total 645 parents who were sent parental consent forms, 146 refused permission. There were two cases who admitted of forging their parents' signatures stating that they were too keen to participate in the study. Three pupils refused to participate despite the parental permission, 12 forgot the form at home and 45 were absent on the day of survey administration.

In addition to that, there was one case where student had verbal parental consent but forgot to get the consent form signed by her parents. She was keen to participate and requested the researcher for initial telephonic verbal consent from parents. Keeping in view the importance of the contribution of each and every individual's participation and student's keenness, the telephonic verbal consent was obtained by the school teacher. This was later on supplemented by written parental consent form through the school teacher on the same day.

During field work, principals of some schools pointed out that most of the parents in the sampled schools are not literate and are not aware of what research is. Hence, they

might not be able to read the information sheet and/ or understand what is being asked of them. Due to this lack of awareness they might not want their child to participate in the research. Keeping in mind the substantial impact of parental refusal on sample size (i.e., 22% reduction of sample) and the fact that knowledge of the consenting people is important to satisfy the conditions of 'informed' consent, another strategy was adopted. Schools were requested to literate parents about what was being asked of them and encourage them to allow their children's participation. In addition the school principals were asked to consent that the parents have been informed about the research and that their children can participate in the research based on their child's own decision. This strategy significantly improved the sample size with only less than 1% parental refusal rate.

PILOT SURVEY INTERVIEWS

Pilot interviews ($N= 4$) were conducted in order to assess the understanding of the Urdu versions of the questionnaires. Pilot interviews were conducted at respondent's home (two interviews), at researcher's home (one interview) and field contact's home (one interview). Written consents were obtained before the interviews. Rapport was established with the respondent and the purpose of the interview was explained to the participants. It took one hour to complete the interview. Feedback on questionnaires was also obtained from the interviewee.

PILOT SURVEY

Pilot survey ($N= 223$) was administered in suburban schools with the help of two female volunteers in girls' school and one male volunteer in boys' school. Only those students were allowed to participate in the study who returned signed parental consent forms. The study was conducted in a group setting in the school hall. Study was introduced to the students by the researcher. Before handing over the survey to the pupils, an opportunity to ask questions related to study was provided. Adolescents took 1-2 hours to complete the survey which was in accordance with the time allowed by the school for survey administration. Verbal feedback from the students and school was obtained.

MAIN SURVEY

After the pilot survey, main study was conducted in classroom settings during school hours in rural and urban schools. In urban schools seven (six female and one male) volunteers assisted in administration of the survey. In rural area schools three female and three male volunteers assisted in administration. Study was introduced by the researcher to the students and the teachers present in the class. Information sheets, consent forms, and an opportunity to ask questions was provided. Total number of enrolled students, number of students present and the age range of each class was noted. Adolescents were provided with the choice to use either English or Urdu version of the questionnaire. Except for four students from a private school, all students preferred to use Urdu version of the questionnaire. Similar to the pilot survey, it took 1 - 2 hours for the students to complete the questionnaires.

ANALYSES

Data analysis was conducted in Statistical Package for Social Sciences version 20 (SPSS 20) and Mplus version 7. All descriptive, correlational and missing values analyses were done in SPSS. For factor analyses and structural equation modelling (SEM) Mplus 7 was used.

Data analyses were done in three steps. Firstly, descriptive analyses of the predictor and outcome variables were conducted. Since the data had missing values, missing values analyses (MVA) and multiple imputation (MI) was also done which is described in detail in the following section. In step two of analyses, bivariate associations of demographic and predictor variables with outcome variable were analyzed based on pooled statistics from five imputed datasets in SPSS. In step three, factor analyses of variables were performed for building measurement model of SEM. This was followed by testing of the structural model of SEM. Following is the detailed description of the procedures used for analyses conducted in this study.

STEP 1

Data was collected from 1420 students (223 in pilot study and 1197 in main study). One hundred and twenty eight cases were excluded, due to more than 50% missing data. Descriptive and missing value analysis was conducted with the rest of the 1292 respondents.

A. Descriptive Analyses

In descriptive analyses, demographic, predictor and outcome variables were described. For categorical variables frequency and percentages were calculated and for continuous variables mean, median, standard deviation, skewness, kurtosis and Kolmogorov Smirnov test (K-S) were used. Pictorial representations in the form of histograms and pie charts are presented. As it was not possible to calculate pooled statistics for descriptive analyses in SPSS, descriptive statistics presented in chapter 3 are based on original dataset with missing values.

B. Missing Values Analysis

During descriptive analyses, missing values due to individual non responsiveness on different items were discovered. The analyses of these missing values indicated that less than 6% responses were missing on items of Adolescent Relationship Scales Questionnaire (ARSQ), Family Affluence Scale (FAS), Life Events Scale (LES), Significant Others Scale (SOS), Hospital Anxiety and Depression Scale (HADS), and Inventory of Interpersonal Problems (IIP-32). In the Youth Health Risk Behavior Survey questions asking about life time DSH and DSH during the past 12 months had 18.5% and 18.19% missing data, respectively. In the demographic section, all variables had less than 5% missing data except for family system (33.5%), relationship status (17%), parental employment status (approx.. 28%), and language used at home (6.6%).

The estimations using the original data set would have resulted in deletion of more than 50% cases which would have reduced the sample size greatly making it insufficient for multivariate analyses that is SEM (Pigott, 2001; Schlomer, Bauman, & Card, 2010). In order to keep the adequate ratio of cases to the variables, multiple imputations of the data were done.

Multiple imputation (MI) procedure was conducted in SPSS 20. To check for the mechanisms of missingness, data was explored by analyzing missing data patterns. Monotonicity was tested for individual questions using missing value patterns chart. As there was no rigid decrease or increase in sequence of missing and non-missing cells, the missingness did not exhibit monotonicity. Little's MCAR test was used to verify whether values were missing completely at random (MCAR) or not. The test assumes that the data are missing completely at random, if the p value is 0.05 or more than 0.05 but if p value is less than 0.05, the data may either be missing at random (MAR) or not missing at random (NMAR). For the present study p value was not significant ($p > 0.05$). Hence, it was concluded that the data was missing completely at random.

After testing for missingness patterns, multiple linear regression was used to impute all missing values except for missing values on Significant Others Scale (SOS). Gender had no missing values and was used as predictor variable only. For each predicted value, a residual from a randomly selected complete case (called random normal deviate or a random deviate) was used. This was calculated on the basis of the square root of the residual mean square from the t distribution. For imputation of SOS items, the mean

substitution method was used as the number of categories of Likert scale used in this study (3 categories) were not enough for the regression to be performed successfully.

Although including maximum number of variables makes missing completely at random (MCAR) assumption more plausible, it was not possible to impute all the variables in a single imputation model due to computational complications. Therefore, as suggested by van Buuren, Boshuizen, and Knook (1999), suitable subsets of data were selected for imputation. All the demographic variables were imputed together and all the scale items were grouped according to the subscales they belonged to.

As a result of MI, five multiply imputed data sets were created. This gives above 90% efficiency for approximately 30% missing data (Schafer & Olsen, 1998). The imputed data sets showed similar distribution to the original data set. After imputation only two cases had missing values on total scores of SOS. Due to zero valid responses for SOS items the missing values could not be imputed and hence these cases were deleted from the data. Finally, after MI total scores for the scales were calculated.

STEP 2

BIVARIATE ASSOCIATIONS

In order to test the hypothesized relationships between the variables bivariate analyses were performed. The Spearman correlation coefficient was used to calculate pooled binary associations between two continuous variables. For multiply imputed

datasets, the commands in SPSS for binary associations between one continuous and one categorical variable do not support pooling of results. For instance, SPSS does not provide any pooled information about the significance of difference between pooled mean ranks through Mann Whitney U test. Hence, in order to provide complete picture of the distribution of the data, results of only mean ranks are reported as pooled results. The significance of the correlation coefficients is reported for each imputed dataset. The results of bivariate analyses are presented in chapter 5 and 6 along with SEM.

STEP 3

STRUCTURAL EQUATION MODELLING

In order to further test the hypothesized relationships between the variables for mediations and moderations, structural equation modelling (SEM) was performed. As first step, several measurement models were built (see chapter 4). This was followed by testing the hypothesized relationships in structural models (see chapter 5 and 6).

For measurement part of SEM, observed indicators were fixed to load onto the latent factor for which they were hypothesized with zero loadings on the other latent factor. For models with multiple latent factors, all the latent factors were correlated with one another by default in Mplus. The residuals associated with each indicator were uncorrelated. The individual factor loadings of each indicator are expressed in terms of standardized regression weights. A cut off value of 0.05 was used to test for; (1) the statistical significance of the observed indicators' factor loadings onto latent variables; (2) the

variances accounted (R^2) by them; and (3) the pathways drawn between latent and observed variables in the structural part of SEM. Indicators with statistically insignificant factor loadings, R^2 and pathways, were deleted from the final models.

For models with continuous variables, Maximum likelihood method (*MLM*) estimator was used to test for model fit. For categorical variables, Weighted Least Squares with Mean and Variance Adjustment (*WLSMV*) was utilized. An important consideration that must be kept in mind here is that in case of analyses with MI data, Mplus 7 does not provide significance value of chi-square for *MLM* and *WLSMV*. Hence, it was not possible to deduce information about model fit from the chi-square value, instead Root Mean Square Error of Approximation (*RMSEA*) was used to test model fit as it corroborates the value of chi-square. Further, it must also be noted here that chi-square test is sensitive to sample size and distribution of variables. With large sample sizes and non-normally distributed variables the value of chi-square test is often statistically significant. As compared to chi-square, *RMSEA* is less sensitive to large sample sizes.

The overall fit of the measurement and structural model was tested by two fit indices; first is the Bentler *Comparative Fit Index (CFI)* which compares the hypothesized model against null model (Bentler, 1990). It ranges from 0 to 1. The closer is the value to 1 better is the model fit. *CFI* values equal to and above 0.9 indicate an equitable fit (Hu & Bentler, 1999). The second model fit index is Root Mean Square Error of Approximation (*RMSEA*). *RMSEA* serves an index for the fit of the model. This index can be used in two ways; either by using a cut off value or confidence intervals (Kelley & Lai, 2011). Since

Mplus did not show confidence intervals for MI data, cut off was used. The cut off value of 0.01 indicates excellent fit, 0.05 indicates good fit and 0.08 indicates mediocre fit (MacCallum, Browne, & Sugawara, 1996). If the models did not reach the required standards of *CFI* and *RMSEA*, and/ or modification indices indicated further theoretically reasonable alterations, changes were made in the model structure which were based on theory, modification indices and factor loadings. Since the datasets used for SEM analyses were multiply imputed datasets and Mplus does not provide modification indices for pooled model results, one of the MI datasets was used to compute modification indices and make changes in the pooled models.

CHAPTER 3

DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

This chapter presents the descriptive statistics and discussion of demographic characteristics of the sample. In this sample ($N = 1290$) categorical demographic variables included gender, relationship status, current parental employment status, living arrangements, religion, family system, diagnosed past and present mental and/ or physical illnesses, perceived disabilities and language skills. Continuous variables included age and family affluence. Although age and family affluence are used as a continuous variable for multivariate analyses, their categories are also presented here. The following table outlines the demographic composition of the sample. Detail description of each demographic variable is stated in the respective sections following the table.

Table 3. 1

Total number (N) and percentages (%) of demographic characteristics in terms of age, gender, relationship status, current parental employment status, family affluence, living arrangements, family system and religion (N=1290).

| Variables and categories | N (%) |
|--|--------------|
| Age ^A | |
| Early adolescence (10-13) | 569 (45.45) |
| Middle adolescence (14-16) | 590 (47.12) |
| Late adolescence (17-19) | 93 (7.43) |
| Gender | |
| Male | 707 (54.8) |
| Female | 583 (45.2) |
| Relationship status ^B | |
| Single | 1010 (94.22) |
| In relationship | 41 (3.82) |
| Engaged/married | 21 (1.96) |
| Father's current employment status ^C | |
| Employed | 1051 (96.51) |
| Unemployed/ retired/ deceased | 38 (3.49) |
| Mother's current employment status ^D | |
| Employed | 77 (8.24) |
| Unemployed/ retired | 858 (91.76) |

| Variables and categories | N (%) |
|--|--------------|
| Family affluence^E | |
| Low family affluence | 550 (42.77) |
| Average family affluence | 579 (45.02) |
| High family affluence | 157 (12.21) |
| Living arrangements^F | |
| Living with both parents | 1077 (86.51) |
| Living with 1 parent/ and 1 stepparent | 124 (9.96) |
| Others | 44 (3.53) |
| Family System^G | |
| Joint family system | 392 (45.69) |
| Nuclear family system | 466 (54.31) |
| Religion^H | |
| Islam | 1206 (98.29) |
| Christianity | 21 (1.71) |

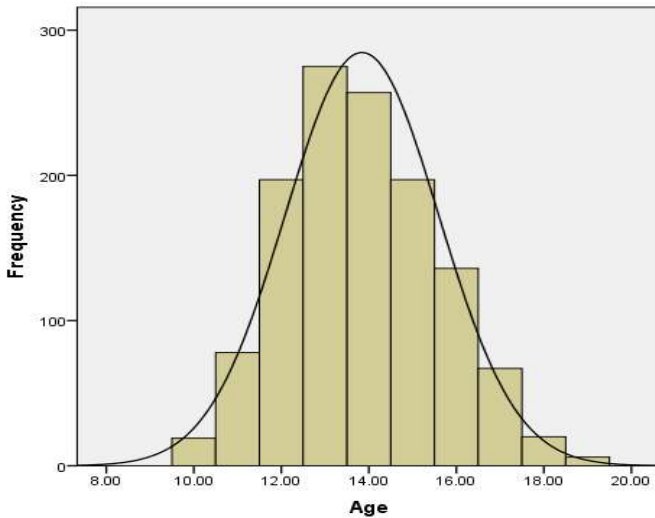
Note: Missing values on A= 38; B =218; C=201; D=355; E=4; F=45; G= 432; H=63.

i. AGE

Age of the participants ranged from 10-19 years ($M = 13.84$ years; median = 14 years; $SD = 1.75$). At the time of data collection most of the participants were 13 years old ($N = 275, 22\%$). Only 6 (0.5%) respondents were of 19 years. Age was non-normally distributed with 0.27 skewness and -0.31 kurtosis ($K-S = 0.14, p < 0.001$). The graphical distribution of age is presented below in the form of following histogram.

Figure 3. 1

Histogram of age with superimposed normal curve (N=1290).



Note: missing values = 38.

ii. GENDER

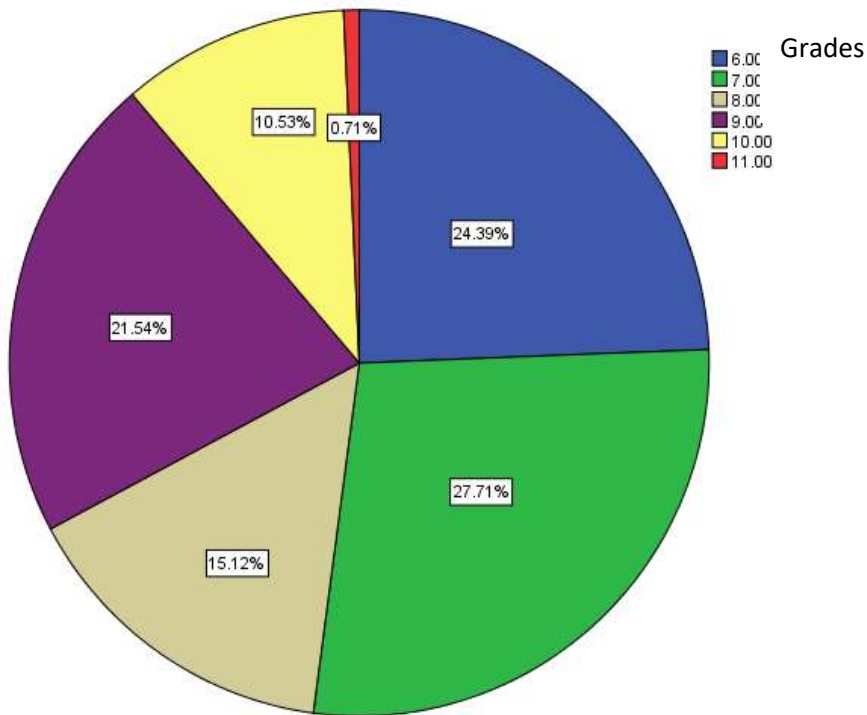
There are 583 (45.2%) females and 707 (54.8%) males in the sample. Based on the pooled crosstab statistics, out of the 583 females 277 (47.51%) were in their early adolescence, 264 (45.28%) were in their middle adolescence and 42 (7.2%) were in their late adolescence. Within males there were 306 (43.28%) early adolescents, 344 (48.66%) middle adolescents and 57 (8.06%) late adolescents.

iii. EDUCATION LEVEL

In this sample, adolescents from grade VI to XI were included. The following pie chart indicates the proportion of students in each grade in the original data set.

Figure 3. 2

Pie chart of distribution of adolescents with respect to education level (N=1290).



Note: Missing values = 27.

The pooled cross tabulation statistics show that in grade VI, 56.73% adolescents were male (10 - 15 years old) and 43.27% were female (10 - 16 years old). In grade VII, there were 56.14% male adolescents (11 - 17 years old) and 44.01% female adolescents (10 -16 years old). In grade VIII, there were 47.24% male adolescents (12 - 17 years old) and 52.76% female adolescents (12 - 18 years old). In grade IX, there were 58.18% male adolescents (13 - 18 years old) and 41.82% female adolescents (12 - 18 years old). Within grade X, there were 55.56% male adolescents of 14 - 18 years of age and 44.44% female

adolescents of 14 – 19 years age. Finally, data from grade XI comprised of female adolescents only ($N = 11$), who were 17 to 19 years old.

iv. RELATIONSHIP STATUS

In this sample only 41 (3.8%) adolescents reported being in a relationship and 21 (2%) reported being engaged or married. Out of these 21 adolescents, only one male adolescent (11 years old) reported being married. The pooled results of cross tabulation with gender indicate that among females, 93.83% were single, 3.78% were engaged and 2.4% were in a relationship. Among males, 89.25% were single, 3.39% were engaged/ married and 7.36% were in a relationship.

v. CURRENT PARENTAL EMPLOYMENT STATUS

One thousand and fifty one fathers (96.5%) and 77 (8.2%) mothers of adolescents were employed. Eleven adolescents' fathers (1%) were unemployed, 16 (1.5%) were deceased and 11 (1%) were retired. Eight hundred and fifty three adolescents (91.2%) reported their mothers to be unemployed and five (0.5%) adolescents' mothers were deceased. In this sample, 32 (2.9%) adolescents' both parents were unemployed, 60 (5.5%) adolescents' both parents were employed, 17 (1.5%) adolescents' only mothers and 991 (90.1%) adolescents' only fathers were employed.

vi. FAMILY AFFLUENCE

Socioeconomic status was measured in terms of family affluence through Family Affluence Scale-II (FAS-II). Scores on FAS-II ranged from 0 to 9. The mean, median and mode on FAS-II was 3.02, 3 and 3 respectively with 1.97 standard deviation. Skewness was 0.37 and kurtosis was -0.47.

vii. LIVING ARRANGEMENTS

Majority of adolescents ($N = 1077$, 86.5%) reported living with both parents and very few indicated living with others ($N = 44$, 3.5%). Out of the total 44 respondents who reported living with other people, 41 respondents provided details of other people they were living with. These included friends ($N = 11$), maternal aunt ($N = 1$), maternal grandmother ($N = 2$), maternal grandfather ($N = 2$), maternal grandparents ($N = 4$), maternal uncle ($N = 6$), paternal aunt ($N = 4$), paternal uncle ($N = 4$) and siblings ($N = 10$).

Pooled results of cross tabulation indicate that among males, 85.43% adolescents were living with both parents, 10.47% were living with one parent or with one parent and a stepparent and 4.24% were living with others. Among females 86.79% reported living with both parents, 4.34% reported living with one parent /and a stepparent and 3.6% females reported living with other people.

viii. FAMILY SYSTEM

The distribution of adolescents living in joint and nuclear family system is shown in table 3.1. According to pooled cross tabulation estimates 51.34% males were living in a nuclear family system while 48.66% males were living in a joint family system. Among females, 41.17% females reported living in a nuclear family system and 58.83% females reported living in a joint family system.

ix. RELIGION

Out of the total 707 male adolescents 97.17% were Muslim and 2.83% were Christian. Among females 97.60% were Muslim and 2.4% were Christian.

x. PAST AND PRESENT ILLNESSES AND PERCEIVED DISABILITIES

A total of 23 (1.8%) respondents reported having physical disabilities. Only one respondent reported having paralysis however, this respondent did not give any details of the disability suffered due to paralysis. None of the students who participated in the survey showed any ostensible signs of severe physical disability during the survey administration.

One hundred and nineteen (9.4%) adolescents reported being diagnosed with physical or mental health condition/s in the past. Further 111 (8%) respondents reported being currently diagnosed with physical and/ or mental health conditions. The past and present illnesses/ disabilities included problems related to kidneys, lungs, heart, chest, head, eyes, ear, nose, throat and stomach, pain, hepatitis and weakness. Two respondents

reported being currently diagnosed with depression and six respondents reported having some mental health issue but did not specify the type of mental health issue. The details provided did not indicate the severity of the problems.

xi. LANGUAGE SKILLS

This study was conducted in English medium schools. The pupils in these schools were considered to be a bilingual population. Questions related to ability to understand, read, write and speak Urdu and English language were asked to explore students' perception of their comprehension level of Urdu and English and whether it is suitable to conduct survey in Urdu with bilingual population. The results indicated that majority of the adolescents could understand, speak, read and write Urdu, while limited number of adolescents could not report the same about English. Responses are summarized in the following table.

Table 3. 2

Total number (N) and percentages (%) of perception of ability to understand English and Urdu language (N=1290).

| Variables and categories | No (N (%)) | Yes (N (%)) |
|---------------------------------|-------------------|--------------------|
| Ability to understand | | |
| English ^A | 702 (55.9) | 556 (44.1) |
| Urdu ^B | 11 (0.9) | 1246 (99.1) |
| Ability to speak | | |
| English ^C | 867 (69.1) | 388 (30.9) |
| Urdu ^D | 10 (0.8) | 1247 (99.2) |

| Variables and categories | No (N (%)) | Yes (N (%)) |
|-------------------------------------|-------------------|--------------------|
| Ability to read | | |
| English ^E | 462 (36.8) | 794 (63.2) |
| Urdu ^F | 25 (2) | 1232 (98) |
| Ability to write | | |
| English ^G | 476 (37.9) | 780 (62.1) |
| Urdu ^H | 24 (1.9) | 1233 (98.1) |
| Other language at home ^I | 483 (40) | 723 (60) |

Note: Missing values: A= 34; B =33; C=35; D=33; E=34; F=33; G=34; H=33; I=84.

More than half of the adolescents (69.9%) also used other languages at home. Out of these, most of the adolescents ($N = 476$, 41.5%) could speak Punjabi, 54 (4.8%) Pushto, 21 (1.8%) Hindku, 19 (1.7%) Kashmiri and 15 (1.3%) Potohari. In addition to these well-known regional languages 90 (6.4%) adolescents reported use of other dialects of these regional languages and 30 (2.6%) reported that they spoke English at home as well. Eighteen adolescents (12.1 %) did not provide any details.

DISCUSSION OF SAMPLE CHARACTERISTICS

Detailed demographic characteristics were explored to obtain information about the representativeness of the sample and applicability of the research findings. Among demographic characteristics age, gender, family affluence, relationship status, living arrangements and family system are discussed here.

AGE, GENDER AND EDUCATION LEVEL

Data was collected from public schools, except for one private school ($N = 4$). Decision to focus more on public schools was made based on the fact that in Pakistan 66% of students are enrolled in public schools (Malik, Amin, Irfan, Kakli, Farooq, & Zia, 2011). However, due to convenient sampling no claim is made about the representativeness of this sample in terms of public sector coverage. Another important aspect of this study is that most of the adolescents in this sample were in their early or middle adolescence. This could be a characteristic of classes which were available for participation. Only students from sixth till tenth grade (with the exception of grade 11 in one school) were recruited because in secondary schools, education is offered from grade 6 till 10 and most of the pupil start secondary school in their early adolescence (see inclusion criteria) and finish by middle adolescence.

Further to this line of discussion, the education system of Pakistan dictates, 11 to 15 years of pupils to be registered in grade six till 10 (Malik, Amin, Irfan, Kakli, Farooq, & Zia, 2011). Contrary to this, the present study indicates disparities in the set criterion and the actual student enrolment. For example, in grade 10 the age range was 14-18 years as compared to grade six (10-16 years). This could be due to the failure of pupils in exams and high repetition rate (Lynd, 2007). It is also possible that some adolescents start school at a much later age than the average age of five years for class one; an indication of lenient recruitment system which allows some students to be enrolled in school at earlier age and some later.

The low representation of grade 8 students (15.12%) was because at the time (January-February) of the data collection many students from grade 8 were busy in their center level exams (which is a competition between several schools for selective students). Similarly, students from grade 10 were preparing for their final board exam (to be held in the month of March) and not all schools allowed access to them.

With respect to gender the representation of females ($N= 583$, 45.2%) and males ($N= 707$, 54.8%) in this sample is similar to the gross percentage of males and females enrolled in secondary education (44 % for females and 54% for males) (World Bank, 2014).

RELATIONSHIP STATUS

In the present study the association of gender with relationship status was significant, with more males being in a relationship. The very small proportion of adolescents involved in a romantic relationship (3.8%) could be an attribute of wide spread Pakistani cultural view that discourage formation of romantic relationships outside of marriage and during adolescence. It is specially considered a matter of dishonor in females' case (Lari, 2011). Cultural intolerance may have also contributed to adolescents' reluctance to report about these relationships.

Low rate of being married/ engaged ($N = 21$) could be attributed to fact that the data was collected from schools and school enrolment is related to increase in age of marriage. Moreover, after marriage females are rarely allowed to go to school (Zia-ur-Rehman,

Saeed, Shaheen, Saeed, Saeed-ur-Rehman, & Haider, 2012). Thus, it is possible that those who got married at an early age were not enrolled in school and hence could not be included in the sample.

FAMILY AFFLUENCE

Family affluence was measured through Family Affluence Scale (FAS-II). There is low rate of missingness ($N=4$) on FAS-II which indicates that FAS-II is more likely to be answered by the adolescents (Boyce, Torsheim, Currie and Zambon, 2006). In present study, most adolescents reported low (42.8%) and moderate (45%) family affluence, as the schools approached for data collection were public sector schools that do not benefit from pupil's parental socioeconomic status to generate fiscal funds for the school (Goldring & Rowley, 2008). Thus, more children with low to moderate family affluence enroll in public schools.

FAMILY SYSTEM AND LIVING ARRANGEMENTS

Traditionally, joint family system was common in Pakistan however, with the changing demographic structure there has been a movement from joint to nuclear family system as depicted in the results (54.3% adolescents reported living in nuclear family system). This can be an attribute of the search for better employment, increased movement of females into paid labor, migration to urban areas for better education and employment opportunities (Afridi, 2008). Very high percentage (86.5%) of adolescents living with both parents is suggestive of low rate of divorce in Pakistan (1-2% (National Institute of

Population Studies & Measure DSH, ICF International, 2013)). Most of those who reported living with others (3.5%) reported living with extended family members. Although, no information was obtained about reasons of living with others, this could be an indication of the importance placed in blood relations as support structures in Pakistani society.

Thus, the demographic characteristics of the sample indicate that the sample consists of higher proportion of younger and middle adolescents; approximately 10% more males than females; more adolescents belonging to low and moderate family affluence; and a predominant proportion of Muslims.

CHAPTER 4

TRANSLATION, ADAPTATION AND VALIDATION OF THE INSTRUMENTS

One of the main concerns in the study of mental health constructs in indigenous settings is to achieve a balance between cultural/ contextual particularity and universality of the constructs. The cultural and contextual particularities can be studied through in-depth analyses of the constructs within specific contexts whereas universality of the constructs can be examined by comparing the mental health constructs across cultures (Cheung, van der Vijver, & Leong, 2011). For cross cultural comparisons standardized instruments are required (Cheung, van der Vijver, & Leong, 2011). At present many standardized instruments are available to study various mental health constructs however, a great majority of these instruments are in languages that are more commonly used in Western countries and do not account for cultural particularities. One probable reason for this could be that psychology became a scientific discipline in the West earlier than other non-Western cultures. This resulted in more research being conducted in Western countries than in non-Western countries like Pakistan (Cheung, van der Vijver, & Leong, 2011). Hence, more instruments were developed in languages that are used in Western set up. In this situation there are two probable alternatives that can be chosen for measuring a construct in an indigenous language and making cross cultural comparisons. One approach

can be to develop a new instrument which can accommodate the cultural variance but this is not always possible due to time consuming procedures and scarcity of resources in Pakistan (Epstein, Santo, & Guillemin, 2015; Stevelink & van Brakel, 2013; Rahman, Iqbal, Waheed, & Hussain, 2003). Furthermore, the basic essence of the most psychological constructs is universal and thus, they can be applied to diverse populations after cultural adaptations (Rahman, Iqbal, Waheed, & Hussain, 2003). Therefore, it is often pragmatic to adopt the second approach of translating and adapting already available instruments (Epstein, Santo, & Guillemin, 2015; Rahman, Iqbal, Waheed, & Hussain, 2003).

The translation and adaptation of instruments not only serves to save time and resources, it also provides an equivalent and comparable measure of a concept. Yet, this approach requires careful consideration of the processes involved and desired outcomes (Guerra, 2013). For instance, from linguistic perspective it is possible that the two languages can have non-equivalent words or idiomatic phrases. Therefore, care must be taken while finding synonyms in other languages (Epstein, Santo, & Guillemin, 2015). Another important consideration that must be made in the process of translating questionnaires is that equal attention should be paid to its all three components; (1) translation, (2) adaptation, and (3) cross-cultural validation. Firstly, translation refers to the process of converting a document from a source language to the target language. Secondly, adaptation considers differences between the source and the target culture in order to preserve equivalence in the meaning of the construct. Finally, the cross-cultural validation process ensures that the translated and adapted questionnaire has similar

properties as the original version and it performs in a comparable manner (Epstein, Santo, & Guillemin, 2015). Ultimately the aim of these three elements is to ensure equivalence of the constructs in the target and source language/culture. There are several criteria for ensuring equivalence which will be narrated in the following section.

EQUIVALENCE CRITERIA

To assess equivalence several indicators can be used. Existing literature recommends use of following criteria for ensuring equivalence (Guerra, 2013; Bolanos-Medina & Gonzalez-Ruiz, 2012; He & van de Vijver, 2012; Chavez & Canino, 2005).

- 1. Semantic Equivalence:** When the meaning of each item in the instrument is same as the meaning in the original language, semantic equivalence is achieved. A thorough process of translation is required for this purpose, which can take months or weeks.
- 2. Content Equivalence:** When the content of each item is pertinent to the culture of the target as well as the original group, content equivalence is established. This is achieved by formulating a committee of people who are familiar with both groups. This committee can carefully review the instrument's content for content equivalence. For this purpose, the committee members must constitute experts in the field. For example, representatives from the target population and a psychologist.
- 3. Technical Equivalence:** When original and translated versions provide

comparable results, technical equivalence is achieved. However, it must be kept in mind that the differences achieved in the results from two versions might be due to techniques used for assessment rather than the translation. Therefore, the capabilities of the participants, their understanding of the instrument's format and administration procedure should be carefully considered. This can be achieved through a multicultural committee, whose members are familiar with the population and field testing of the instrument. Test-retest reliability and internal consistency are also used for this purpose. Furthermore, the comparison of the target population's results with the results of the instrument administered in a population whose native language is the language of the instrument, can also serve as an evidence of technical equivalence.

4. **Conceptual Equivalence:** Conceptual or construct equivalence refers to the need for evaluating the same theoretical construct in the target population's culture, as well as in the culture for which the instrument was originally developed. For this purpose, factor analysis on results obtained from both populations can be done. Conceptual equivalence can also be established through determining the association of the construct under consideration with other relevant concepts by testing whether hypothesized relationships are confirmed or not.
5. **Criterion Equivalence:** Criterion equivalence is the similarity in the interpretation of the results obtained with the established norms of the culture of both populations. This can be achieved by interpreting an instrument's relationship to the established independent criteria which are culturally appropriate. This independent criteria usually consists of an instrument that is considered gold

standard in the field.

In addition to these criteria, it is also important to keep in mind the demographic characteristics of the population. For instance, age, gender and education level. This sometimes requires change in the original wording of the questionnaire by inserting words that are easier to understand for individuals from the target population (WHO, 2015b). Thus, whatsoever is the procedure employed for translation it should ensure the comparability of the instrument and the contextual relevance for the concept being explored through that instrument. For this purpose, several procedures have been recommended in the extant literature which will be reviewed in the next section.

REVIEW OF TRANSLATION PROCEDURES FOR ACHIEVING EQUIVALENCE

There are two commonly recommended ways to ensure appropriate translation, adaptation and validation of the psychological instruments; (1) psychometrics and (2) expert judgements. These two methods are often used in combination to ensure equivalence (Borsa, Damásio & Bandeira, 2012; Reichenheim & Moraes, 2007; Zavala-Rojas, 2014). Psychometrics involve conducting statistical analyses such as correlation, reliability and factors analyses. This is done to ensure technical, conceptual and criterion equivalence. For content and semantic equivalence expert judgment is required. The guidelines descending from Brislin have been widely used for expert judgment (Sousa & Rojjanasrirat, 2011; Epstein, Santo, & Guillemin, 2015; Santo, Ferreora, Alves, Epstein & Novaes, 2015; Stevelink & van Brakel, 2013). Often the new methods or the developments made in the translation and adaptation of instruments are based on Brislin's

recommendations which consists of four methods to translate instruments: back-translation method, bilingual technique, committee approach and pre-test procedure (Brislin, 1970). All of these methods have their own complications. For instance, in back-translation method since there is no limit to how many versions should be produced before consensus is obtained, it cannot be precisely estimated how many translators and back translators are needed. In bilingual technique, characteristics of the two samples may vary and be responsible for the disagreement in results, rather than the errors in the translation. In case of committee approach, more than three qualified bilingual members are required. For pre-testing, sample of the pilot study and the main study must be similar in their demographic characteristics (Cha, Kim, & Erlen, 2007). An alternative to avoid biases arising from these individual techniques is to use a combination of these methods (Jones, Lee, Phillips, Zhang, & Jaceldo, 2001). The advantage of using these translation techniques together, is to ensure equivalence of the instruments and to improve cross cultural comparisons. Keeping in view the importance of using research interments that can capture the cultural peculiarity and universality of the concepts and the scarce resources available for conducting research in Pakistan especially for child and adolescent mental health (Syed, Hussein, Azam, & Khan, 2009), this study translated, adapted and validated the instruments into Urdu language by using a combination of Brislin's four methods for expert judgement. Psychometric evaluations of the translated versions were also conducted.

OBJECTIVES

Following are the objectives of the translation phase of the study.

1. To translate and culturally adapt Youth Health Risk Behaviour Survey, Significant Others Scale, and Inventory of Interpersonal Problems-32 into Urdu language by using Brislin's translation guidelines.
2. To establish the semantic and content equivalence through expert judgement (i.e. back-translation method, committee approach and pre-test procedure) during the process of translation.
3. To establish the technical and construct equivalence of the Urdu translated versions through psychometric evaluation in terms of reliability and factor analyses.

HYPOTHESES

For conducting confirmatory factor analyses following hypotheses were formulated based on theory and previous factor structure of the instruments.

1. Based on continuum hypothesis (see chapter 1: DSH continuum approach) factor analysis of items of Youth Health Risk Behaviour Survey pertaining to DSH will result in two subscales (suicidal DSH and non-suicidal DSH) converging to give a single construct (DSH) i.e. two secondary factors converging to one primary factor.

2. Similar to original factor structure, Inventory of Interpersonal Problems-32 has eight secondary factors converging to one primary factors.
3. Items of Significant Others Scale (actual social support) will converge to one primary factor.
4. Items of Hospital Anxiety and Depression Scale (HADS) will converge to two correlated primary factors; depression and anxiety
5. Items of Life Events scale (LES) from CASE questionnaire will converge to give one primary factor
6. Items of Family Affluence Scale-II (FAS-II) will converge to form one primary factor.

METHOD

Urdu versions of Hospital Anxiety and Depression Scale (HADS), Significant Others Scale (SOS), Life Events scale (LES) from CASE questionnaire, and Family Affluence Scale-II (FAS-II) were already available. Thus, Urdu versions of Inventory of Interpersonal Problems-32 (IIP-32), Youth Health Risk Behavior Survey (YHRB), and demographic questions for family system and diagnosed physical and mental health conditions were prepared. A combination of expert judgment procedures (back translation, committee approach and pretesting) and psychometric evaluation were employed for translation of scales. For IIP-32, DSH questions from YHRB and demographic questions both expert judgement and psychometric evaluations were

employed. As translated versions of HADS, ARSQ, FAS-II and LES were already available they were reviewed and their psychometric evaluation was conducted.

A. EXPERT JUDGMENT

For expert judgment Brislin's translation guidelines (Brislin, 1970; Banville, Desroiers, Genet-Volet; 2000; Peters & Passchier, 2006) were used to translate the instruments into Urdu language.

Team Formulation for Translation

A team of 10 members knowledgeable about the instrument constructs and the population being studied, was formed for translation. These team members had an implicit command of Urdu and English languages. The main objective of this team was to simplify the translation and to make it as comprehensible as possible, while maintaining the concept of the items intact. This was done in accordance with the cognitive, cultural and language development levels of the target group. For example, the target group used both Urdu and English language; Urdu being the base language with incorporation of words or phrases from English. Often English language alternates are commonly used and better understood by Pakistani adolescents than Urdu. Therefore, in instances when an easier alternative was found in English language it was inserted along with the difficult Urdu word and later on tested in the pilot study.

The team consisted of one forward translator, one backward translator and two review panels. Panel 1 consisted of five members for review of forward translation and Panel 2 comprised of 3 members for comparison of backward translation with original version of the instruments.

Following are the steps undertaken to translate the instruments:

Forward Translation

All scales were translated by a bilingual translator with previous experience of translating and adapting scales into Urdu language. The translator's first language was Urdu.

First Review by the Panel 1

This panel consisted of five members (a psychologist and a secondary school teacher with previous experience of translation, two members with eight years of experience in working with anti-narcotics department and a Masters' degree holder researcher). Once the scales were translated, the translation was reviewed for the phrasing of items with reference to difficulties in conception. This panel identified, discussed and evaluated the instruments for:

1. Items with inadequacy in communicating their intent.
2. Items with problematic words to translate and those considered as local to the source culture but not target culture.

“Difficult word” list (see appendix) was prepared for above mentioned issues. The list contained words which were most accurate alternatives when a perfect translation was not possible. The final phrasing of items was then formulated based on words that are common in culture or closest alternatives. When more than one word seemed to equally qualify for translation, alternative words or phrases were placed in parentheses to be finally tested in the pilot study.

Pilot Interviews

Pilot individual interviews were conducted with four school going adolescents (age 11 and 12 years). Adolescents were selected through convenient sampling. Purpose of the study was explained to them and an information sheet was given. Written consent was obtained from the respondents. Initially all the questionnaire items were read aloud to the respondents and they were asked to respond to the questions and point out if they do not understand or find it difficult to understand any item/ phrase/ word. If an adolescent reported having difficulty in comprehending any item/ phrase/ word. The same item was read to them three times and slowly. If they still reported that they were not sure about what was being asked, they were asked to explain what they understood and respond accordingly. The items/ phrases/ words pointed out in the interviews as not comprehensible or difficult to comprehend were then marked. A list of suggestions was prepared for review by panel 1.

Second Review by the Panel 1

The suggestions and possible alternatives for difficult items/ words/ phrases identified in the pilot interviews were incorporated in the instruments after discussion with the panel 1.

Back Translation

This final version was then back translated by an independent translator, who was not involved in the earlier translations and who had not seen the original English version of the questionnaire.

Review by the panel 2

A panel of 3 members compared the back translated instruments to the original version. Any items that did not retain their original meaning and intention were re-translated into Urdu and processed through the same procedure of analyses by the panel.

Pilot Survey

After this, instruments were administered as a survey on 220 adolescents (98 males, 122 females; ages 10 - 19 years). The main aim of this survey was to check the comprehension of the instruments by the wider population of adolescents and the difficulty level. Verbal feedback was taken from them. Another list of suggestions was prepared and discussed with the panel 1. All adolescents reported difficulties with answering Significant

Others Scale and additional instructions were required. Initially, Significant Others Scale's items were scored on 7 point Likert scale as shown in the following figure.

Figure 4. 1

Seven point Likert scale for items of Significant Others Scale

| <i>Never</i> | | <i>Sometimes</i> | | | <i>Always</i> | |
|--------------|----------|------------------|----------|----------|---------------|----------|
| <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> | <i>7</i> |

Adolescents were unable to understand whether '1' corresponded to never or '2' and that this Likert scale was presenting a range of scores from 1 to 7. Hence, the Likert scale options were reduced to 3 where 1 represented never, 2 represented sometimes and 3 represented always. This scale was similar to the Likert scale response options of other instruments used in this study.

Final Refinements

Final refinement of the instruments was done based on discussions with the panel 1 and on the basis of aforementioned pilot study.

B. PSYCHOMETRIC EVALUATION

For psychometric evaluation, reliabilities were calculated in SPSS-20 and factor analyses were conducted in Mplus. Reliabilities of the scales calculated in the present study were compared with the reliabilities of other existing studies. For factors analyses,

confirmatory factor analysis was conducted as a first step and if the model fit was inadequate modifications were made. Changes were made in the model structure based on theory, modification indices and factor loadings. For DSH and life events, exploratory factor analyses was conducted within the confirmatory factor analyses framework. To analyze the fit of the factor structure Bentler *Comparative Fit Index (CFI)* (ranging from 0 to 1) and Root Mean Square Error of Approximation (*RMSEA*) were used. Details of the indices used are already explained in chapter 2.

For the sake of continuity, in addition to presenting results and discussion of factor analyses of translated instruments results of factor analyses of HADS, Negative Life Events Scale and Family affluence scale-II are also presented here as all of these factor structure were later on employed as measurement part of SEM. Descriptive statistics of these scales are also presented in their respective sections.

REVIEW OF AVAILABLE TRANSLATED VERSIONS OF INSTRUMENTS

Hospital Anxiety and Depression Scale (HADS), Family Affluence Scale- II (FAS-II), Adolescent Relationship Scales Questionnaire (ARSQ), and Negative Life Events Scale (LES) and demographic items from CASE questionnaire were evaluated by the translation team for their quality of translation and cultural adaptation. Minor changes were made in LES through the same procedure as carried out for the translation of scales.

RESULTS AND DISCUSSION

In this section results of reliability analyses, descriptive statistics and factor analyses followed by discussion for each instrument are presented.

A. RELIABILITY OF SCALES

The reliability is calculated in terms of internal consistency (Cronbach's alpha). These are presented in the following table along with the reliabilities obtained from other existing studies.

Table 4. 1

Reliability of scores of Family Affluence Scale (FAS-II), Adolescent Relationship Scale Questionnaire, Significant Others Scale, Inventory of Interpersonal Problems-32, Hospital Anxiety and Depression Scale and Negative Life Events Scale obtained in the present study and other existing studies (N=1290).

| Scale/ Subscales | No. of item | α in present study | α in previous studies |
|---|--------------------|---|---|
| DSH | 5 | 0.72 | No existing study |
| Family affluence scale-II^E | 4 | 0.48 | 0.58 (Liu, Wang, Villberg, Torsheim, Tynjala, Lv, & Kannas, 2012) |
| Adolescent Relationship Scales Questionnaire | | | |
| Secure ^F | 5 | 0.07 | 0.70 (Scharfe, & Eldredge, 2001) |
| Dismissing ^G | 5 | 0.45 | 0.45 (Scharfe, & Eldredge, 2001) |
| Fearful ^H | 4 | 0.54 | 0.77 (Scharfe, & Eldredge, 2001) |

| Scale/ Subscales | No. of item | α in present study | α in previous studies |
|--|-------------|---------------------------|---|
| Preoccupied ^I | 4 | 0.22 | 0.75 (Scharfe, & Eldredge, 2001) |
| Significant Others Scale^J | 4 | 0.90 | |
| Actual emotional social support ^K | 2 | 0.84 | 0.59 to 0.97 (Tsang, Lam, & Yee-Chiu, 2011) |
| Actual practical social support ^L | 2 | 0.80 | 0.64 to 0.93 (Tsang, Lam, & Yee-Chiu, 2011) |
| Inventory of Interpersonal Problems^M | 32 | 0.88 | 0.87 (Barkham, Hardy, & Startup, 1996) |
| Socially avoidant ^N | 4 | 0.63 | 0.84 (Barkham, Hardy, & Startup, 1996) |
| Intrusive ^O | 4 | 0.42 | 0.70 (Barkham, Hardy, & Startup, 1996) |
| Non-assertive ^P | 4 | 0.62 | 0.82 (Barkham, Hardy, & Startup, 1996) |
| Exploitable ^Q | 4 | 0.46 | 0.71 (Barkham, Hardy, & Startup, 1996) |
| Cold ^R | 4 | 0.74 | 0.80 (Barkham, Hardy, & Startup, 1996) |
| Vindictive ^S | 4 | 0.76 | 0.64 (Barkham, Hardy, & Startup, 1996) |
| Domineering ^T | 4 | 0.60 | 0.80 (Barkham, Hardy, & Startup, 1996) |
| Overly nurturant ^U | 4 | 0.67 | 0.80 (Barkham, Hardy, & Startup, 1996) |
| Hospital Anxiety and Depression Scale | | | |
| Anxiety subscale ^V | 7 | 0.67 | 0.68 – 0.93 (Bjelland, Dahl, Haug & Necklemann, 2002) |
| Depression subscale ^W | 7 | 0.43 | 0.67 – 0.90 (Bjelland, Dahl, Haug & Necklemann, 2002) |

Note: α = Cronbach's alpha. Missing values are A= 275; B=185; C= 61; D=87; E= 88; F= 122; G= 165; H= 100; I= 110; J= 12; K= 15; L= 16; M= 332; N= 77; O= 69; P= 92; Q= 76; R= 91; S= 96; T= 75; U= 75; V= 98; W= 90; X= 217; Y= 175; Z= 83.

The preceding table shows that most of the scales have moderate to high internal consistency values (0.60 – 0.90) while some have just acceptable (0.42 – 0.54) Cronbach alpha values. A few scales have low Cronbach alpha values for instance, 0.07 for secure and 0.22 preoccupied subscale of attachment. Low Cronbach alpha values of these subscales of ARSQ are also reported in other studies (e.g., Griffin & Bartholomew, 1994).

B. DESCRIPTIVES AND FACTOR ANALYSES OF THE SCALES

1. DELIBERATE SELF HARM (DSH): YOUTH HEALTH RISK BEHAVIOR SURVEY

In this sample, life time prevalence of deliberate self-harm (DSH) (including both suicidal and non-suicidal) is found to be 7% ($N = 89$). Seventeen adolescents reported committing both suicidal and non-suicidal DSH. The following table summarizes the frequency and percentage of DSH behaviors.

Table 4. 2*Total number (N) and percentages (%) of items measuring DSH (N=1290).*

| Variables and categories | N (%) |
|--|--------------|
| 1. Hopelessness | 182 (14.3) |
| 2. Considered attempting suicidal DSH | 77 (6) |
| 3. Planned to attempt suicidal DSH | 62 (4.9) |
| 4. Life time prevalence of non-suicidal DSH ^B | 44 (4.2) |
| 5. One year prevalence of non-suicidal DSH ^C | 43 (4.1) |
| 6. Actual suicidal DSH attempt during past 12 months | 51 (4) |
| 7. Life time prevalence of deliberate self-harm (DSH) ^A | 89 (7) |

Note: Missing values on A= 12; B = 239; C= 235.

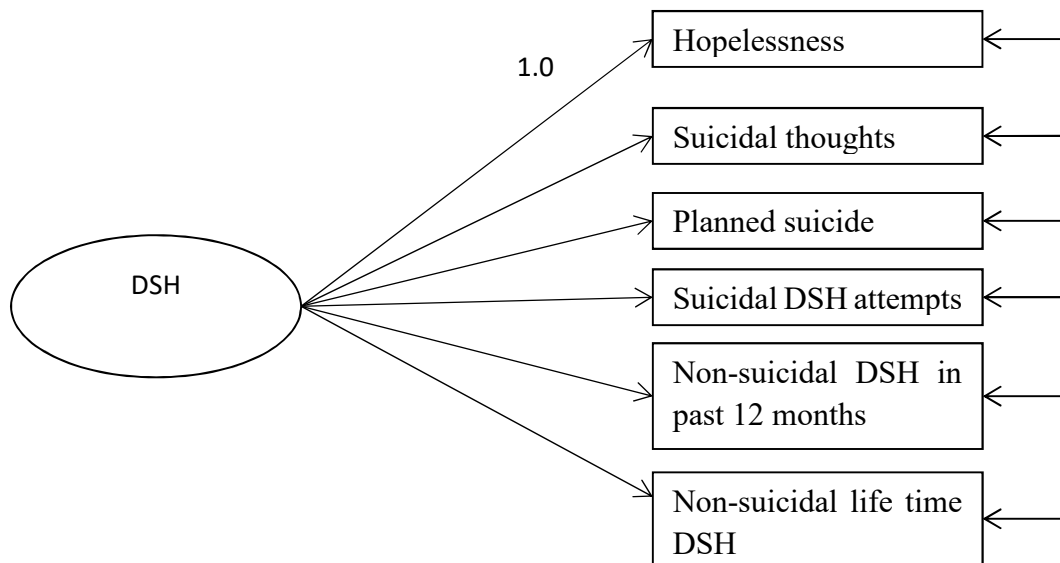
7 = Frequency and % of those who reported DSH either on questions asking about non-suicidal life time DSH, non-suicidal DSH in the past year or suicidal DSH.

Factor analysis of DSH

In this study deliberate self-harm (DSH) was measured with 5 items from Youth Health Risk Behavior Survey. As suggested by Hawton and Fortune (2009), DSH was taken along a continuum in this study. Two factors (DSH with suicidal intent and without suicidal intent) model were tested first but the model failed to converge for two factor approach. Therefore, items measuring DSH were loaded onto a single latent variable. The hypothesized model for single factor is presented in the figure 4.2.

Figure 4. 2

Hypothesized factor structure of DSH.



The hypothesized one factor model was subjected to a priori first order exploratory factor analysis. A total of 6 indicators were used to predict DSH.

Hypothesized Model

The overall model had mean $\chi^2 = 79.92$ (WLSMV) with $df = 9$. In addition the mean CFI was 0.97 and mean RMSEA was 0.09 which indicated a poor fit to data.

Final model

The final model (mean $\chi^2 = 22.32$; $df = 4$; mean CFI = 0.99; mean RMSEA = 0.06) showed good fit to the datasets. It consisted of five indicators, one latent variable and 20 free parameters. The smallest standardized estimate (0.50, $p < 0.001$) was of 'non-suicidal

lifetime DSH'. The remaining estimates for the standardized regression weights ranged from 0.57 (non-suicidal DSH in past 12 months) to 0.90 (suicidal DSH attempts). Non-suicidal lifetime DSH had lowest R^2 statistic (0.26, $p < 0.005$). The remaining variables also had significant R^2 statistic that range from 0.33 (hopelessness) to 0.81 (suicidal DSH attempts). Lifetime non-suicidal DSH significantly correlated with non-suicidal DSH in past 12 months ($r = 0.46$, $p < 0.001$). Planned suicide was excluded from the final model due to its poor performance in the model. The overall model fit indices suggested that the model fits the data well and the factor loadings are statistically significant. The diagrammatic presentation of the final model with standardized loadings and the variance accounted by each indicator is presented in following diagram and table respectively.

Figure 4. 3

Obtained factor structure of DSH.

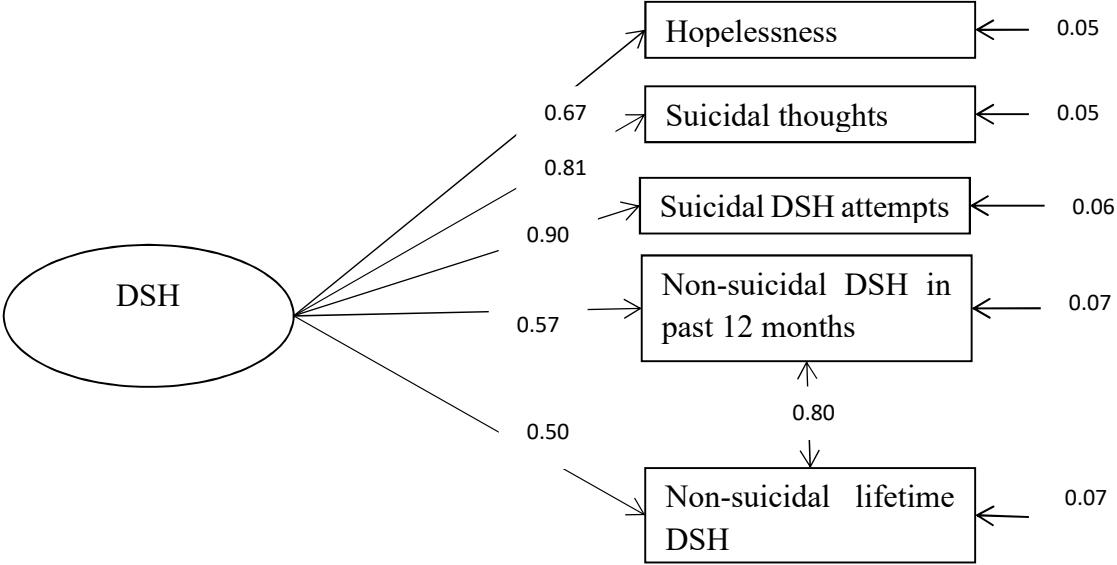


Table 4. 3*Variance accounted for (R^2) by deliberate self-harm (DSH) items. (N=1290).*

| Indicators | R^2 | SE |
|---------------------------------------|-------------------------|------------------------|
| 1. Hopelessness | 0.44** | 0.06 |
| 2. Suicidal thoughts | 0.65** | 0.08 |
| 3. Suicidal DSH attempts | 0.81** | 0.11 |
| 4. Non-suicidal lifetime DSH | 0.33** | 0.08 |
| 5. Non-suicidal DSH in past 12 months | 0.26** | 0.08 |

Note: **= $p < 0.001$; SE = standard error; R^2 = variance

DSH: DISCUSSION

With respect to suicidal DSH ideation (6%) and planning (4.9%) the rates found in the present study are higher than the rates of another recent study conducted on Pakistani school going adolescents (Shaikh, 2014). Shaikh (2014) found rate of suicidal ideation and planning of DSH (with/ without suicidal ideation) to be 3.3% and 7.4% respectively among Pakistani school going adolescents (N=5185). To the best of our knowledge, there is no other study in Pakistan which has calculated prevalence rates of the actual act of DSH among school going adolescent. In the present study life time prevalence of actual act of DSH (both suicidal and non-suicidal) is 7%. For suicidal DSH it is 4% and non-suicidal 4.2%. One year prevalence of DSH without suicidal intent is 4.1%. These percentages are smaller than the rates given by Skegg (2005); 5 - 9% point prevalence and 13-30% life time prevalence. These prevalence estimates are also smaller than 13.2% DSH

in England (Hawton, Rodham, Evans, & Weatherall, 2002), 13.8% in Scottish school going adolescents (O'Connor, Rasmussen, Miles, & Hawton, 2009) and 10% among Irish adolescents (Morey, Corcoran, Arensman, & Perry, 2008). Hence, despite the alarm raised about increasing rates of DSH in Pakistan (Shahid & Hyder, 2008), the rates were low in the present study as compared to Western countries. One of the reasons for this could be religion. DSH is prohibited in Islam (Quran 2:129, 4:29, 7:157) which might be acting as a protective factor against DSH or lead to low reporting rates of DSH out the fear of stigma. The second probable reason seems more plausible as approximately 18% of responses on DSH acts were missing.

The model of DSH built through factors analysis contributes to theory and measurement of DSH in four ways. Firstly, the successful convergence of the model with good *RMSEA* and *CFI* shows that these indicators can be used to measure DSH as a continuous phenomenon. Secondly, when the initial two factor model (DSH with suicidal intent and without suicidal intent) was tested, the model failed to converge for two factor approach and only one factor model converged. Thus, the final model advocates that suicidal and non-suicidal DSH are parts of the same concept as suggested in existing studies (Tormoen, Rossow, Larsson, & Mehlum, 2013) and Joiner's theory (Joiner, 2005). This conclusion is also supported by the descriptive result of 17 adolescents who were involved in both suicidal and non-suicidal DSH. These findings confirmed that in order to accommodate the overlap of non-suicidal and suicidal DSH it is more judicious to measure DSH as a continuous construct. Collectively all these results support Hawton and Fortune's (2009) continuum approach. However, an important difference from Hawton

and Fortune's (2009) continuum and the third unique contribution of this study is that it successfully included hopelessness as an indicator of DSH. The link established between hopelessness and DSH is theoretically grounded in cognitive theories which suggests that hopelessness is an essential cognitive vulnerability (Klonsky & May, 2015; Abramson, et al. 2000; Klonsky, Kotov, Bakst, Rabinowitz, & Bromet, 2012) that has been widely associated with the risk for DSH (Hamza, Stewart, & Willoughby, 2012; Victor & Klonsky, 2014; Salman, Idrees, Hassan, Idrees, Arifullah, & Badshah, 2014; Steeg et al., 2016).

The fourth interesting and unexpected finding of the factor analysis is that the item measuring planning for suicidal DSH (during the past 12 months, did you make a plan about how you would attempt suicide?) was excluded from the final model due to its poor performance. One probable explanation for this can be drawn from the existing studies. Existing literature indicates that adolescents who engage in DSH report impulsivity (O'Connor, Rasmussen, Miles, & Hawton, 2009). Impulsivity and lack of long term planning for DSH among adolescents has been reported in more recent studies as well (Townsend et al., 2016). Furthermore, in the context of development, prefrontal cortex of adolescent brain is not fully matured (Romer, 2010). Both, impulse control and planning are functions of prefrontal context which is not completely developed until adulthood is reached (Weinberger, Elvevag, & Giedd, 2005). Therefore, adolescents have greater tendency to act with little planning i.e., low planned DSH (Smith, Witte, Teale, King, Bender, & Joiner, 2008; Connor, 2004). On the other hand there is also plenty of evidence for longer periods of planning for DSH i.e. high planned DSH (Gvion & Apter, 2012,

Connor, 2004). There is not much direct statistical data available to ascertain that low planned DSH is more evident in adolescence, yet the association of impulsivity with DSH and developmental stage of adolescents is suggestive of greater chances of low planned DSH among adolescents. Thus, it seems reasonable to suggest further exploration in future research before excluding/ including planning as an indicator of DSH among Pakistani adolescents. Perhaps the item exploring planning of DSH should be modified to accommodate impulsivity and short term planning.

To conclude, the evidence provided by the factor analysis of DSH with 5 indicators is suggestive of considering continuum approach in SEM of the present study and future research.

2. ATTACHMENT: ADOLESCENT RELATIONSHIP SCALE QUESTIONNAIRE (ARSQ)

The following table provides information about mean, median, standard deviation and normality test of the four attachment styles and two models of attachment.

Table 4. 4

Mean, median, standard deviations (SD) and test for normality (K-S) of Adolescent Relationship Scales Questionnaire subscales (ARSQ) (N=1292).

| Subscales | Mean | Median | SD | K-S | p |
|--------------------|-------------|---------------|-----------|------------|-----------|
| Secure | 1.85 | 1.8 | 0.72 | 0.08 | <0.001 |
| Fearful | 1.66 | 1.75 | 1.01 | 0.08 | <0.001 |
| Preoccupied | 1.96 | 2 | 0.89 | 0.09 | <0.001 |
| Dismissing | 1.87 | 2 | 0.86 | 0.09 | <0.001 |
| Self model | 0.11 | 0.12 | 1.7 | 0.02 | 0.1 (n.s) |
| Other model | 0.28 | 0.3 | 1.71 | 0.02 | 0.1 (n.s) |

Note: $p < 0.001$; *SD*= standard deviation; K-S= Kolmogorov-Smirnov test; n.s= not significant.

The four attachment styles showed non normal distribution while the two models of attachment had normal distribution. The secure, fearful, preoccupied and dismissing attachments styles along with self and other model had skewness values of -0.31, 0.14, 0.3, - 0.38, -0.04 and -0.17, respectively. The corresponding values of kurtosis were -0.18, -0.69, -0.46, -0.39, 0.25 and -0.11.

3. SOCIAL SUPPORT: SIGNIFICANT OTHERS SCALE (SOS)

Social support was measured by Significant Others Scale (SOS). It was measured in terms of total, practical and emotional social support. Each of these types of social support was further measured in terms of actual and ideal social support dimensions. The discrepancy scores were also calculated for difference between actual and ideal dimensions of total, practical and emotional social support. The following table presents

mean, median, standard deviation and test of normality of distribution of scores on social support.

Table 4. 5

Mean (M), median (Md), standard deviations (SD) and test for normality (K-S) for social support measured by Significant Others Scale (N=1290).

| Subscales | M | Md | SD | K-S | p |
|--|----------|-----------|-----------|------------|----------|
| Actual Emotional support^A | 1.47 | 1.6 | 0.48 | 0.13 | <0.001 |
| Ideal emotional support^B | 1.44 | 1.6 | 0.51 | 0.13 | <0.001 |
| Actual practical support^C | 1.52 | 1.6 | 0.46 | 0.14 | <0.001 |
| Ideal practical support^D | 1.5 | 1.6 | 0.47 | 0.14 | <0.001 |
| Actual total social support^E | 1.49 | 1.6 | 0.45 | 0.12 | <0.001 |
| Ideal total social support^F | 1.47 | 1.55 | 0.46 | 0.12 | <0.001 |
| Discrepancy in emotional social support^G | 0.14 | 0.09 | 0.17 | 0.24 | <0.001 |
| Discrepancy in practical social support^H | 0.14 | 0.12 | 0.19 | 0.21 | <0.001 |
| Discrepancy in total social support^I | 0.28 | 0.18 | 0.32 | 0.19 | <0.001 |

Note: Missing values on A= 6; B = 12; C= 10; D= 12; E= 6; F= 10; G= 14; H=16; I= 13.
 $p < 0.001$; K-S= Kolmogorov-Smirnov test.

Among the sources of social support, parents, siblings, cousins, friends, class fellows, teachers, girlfriends, neighbors, and maternal and paternal uncles, aunts and grandparents were mentioned. Although no exact count of the frequency of each reported sources of social support was calculated due to computational complications parents, siblings and peers were mentioned by all the adolescents except for those who reported no social support. The total, emotional and practical social support on actual and ideal dimensions

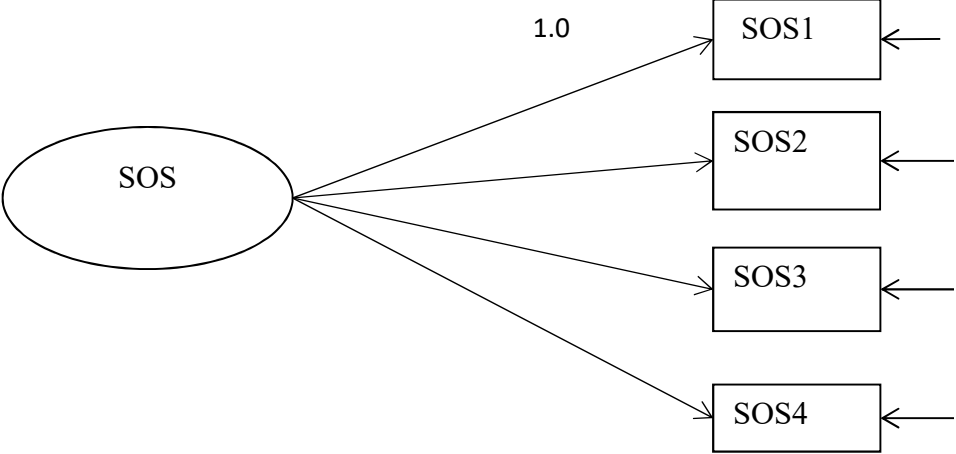
and the discrepancy scores between the actual and ideal dimensions of total, emotional and practical social support were non-normally distributed with -1.15, -1.12, -1.22, -1.2, -1.23, -1.21, -1.83, -2 and -1.92 skewness respectively. The corresponding values of kurtosis were 1.01, 0.75, 1.24 1.19, 1.34, 1.19, 4.82, 5.4 and 5.11.

Factor Analysis of Significant Others Scale

Model for perceived actual social support was built by using four indicators which were created by adding scores on each item for each person identified as a source of social support and then the mean for the total score for each created indicator was calculated (for instance indicator 1= (SOS1 for first person + ... +SOS1 for last person)/ N , indicator 2= (SOS2 for person 1+ ... +SOS2 for last person)/ N and so on). Mean was taken because the adolescents identified same person more than once as a source of social support and rated the social support provided by that person, and/or indicated and rated multiple persons together. The hypothesized model is presented in the following figure.

Figure 4. 4

Hypothesized factor structure of Significant Others Scale (SOS).



The hypothesized one factor model was subjected to a priori exploratory factor analysis. A total of 4 indicators were used to predict social support (including both practical and emotional social support) with 12 free parameters. Following table presents distribution of scores on the indicators in terms of pooled mean and pooled standard deviation.

Table 4. 6

Pooled mean (M) and standard deviation (SD) of indicators of Significant Other Scale (N=1290).

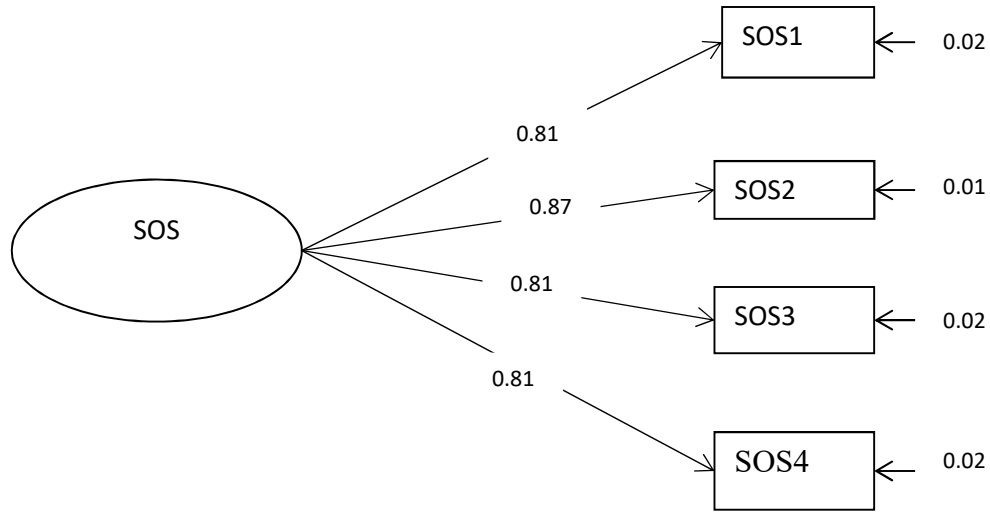
| Indicators | M | SD |
|---|----------|-----------|
| SOS1: Can you trust, talk to frankly and share feelings with this person? | 1.43 | 0.52 |
| SOS2: Can you lean on and turn to this person in times of difficulty? | 1.51 | 0.51 |
| SOS3: Do they give you practical help? | 1.54 | 0.49 |
| SOS4: Can you spend time with them socially? | 1.50 | 0.49 |

Hypothesized/ Final Model

The overall model had good fit with mean $\chi^2 = 3.51$ (*MLM*) and $df = 2$. The mean *CFI* was 0.99 and mean *RMSEA* 0.02. The factor loadings presented in the following figure were statistically significant and high in magnitude.

Figure 4. 5

Obtained factor structure of Significant Others Scale (SOS).



Following table presents the variance explained by each indicator as R^2 .

Table 4. 7

Variance accounted (R^2) by indicators of Significant Other Scale ($N=1290$).

| Indicators | R^2 | SE |
|-------------------|-------------------------|------------------------|
| SOS1 | 0.66** | 0.02 |
| SOS2 | 0.76** | 0.02 |
| SOS3 | 0.65** | 0.03 |
| SOS4 | 0.65** | 0.03 |

Note: $p < 0.001$; R^2 = variance; SE = standard error.

SOS: DISCUSSION

Only four items pertaining to actual total social support were used for SEM. The decision to use only perceived actual social support in SEM was made because previous literature indicated that discrepancy scores have additive value and they cannot substitute perceived social support in all contexts (Cho, Zunin, Chao, Heiby, & McKoy, 2012). Moreover, it was not possible to use subscales for emotional and practical social support in SEM due to the fact that for a reasonable factor structure at least three indicator items are required whereas. in SOS only two items are allocated for each subscale. The *RMSEA* (0.02) and *CFI* (0.99) values and high factor loadings (> 0.80) indicated the good factor structure of SOS; and adequacy of Urdu translated items in measuring perceived actual total social support.

4. INTERPERSONAL RELATIONSHIP STYLE PROBLEMS: INVENTORY OF INTERPERSONAL PROBLEMS-32 (IIP-32)

In this sample, interpersonal relationship style problems measured by Inventory of Interpersonal Problems (IIP-32) showed non normal distribution ($K-S = 0.04, p < 0.001$). The mean score for interpersonal relationship style problems was 49.76 with median 49 and standard deviations 21.91. Total scores of IIP-32 ranged from 0 - 124. The distribution of scores was skewed (0.19) with a kurtosis of -0.05. Descriptive information on subscale scores are presented in the following table.

Table 4. 8

Mean (M), median (Md), standard deviations (SD), skewness, kurtosis and test for normality (K-S) of subscales of Inventory of Interpersonal Problems (IIP-32) (N=1290).

| Subscales | M | Md | SD | Skew | Kurt | K-S | p |
|--------------------------|----------|-----------|-----------|-------------|-------------|------------|----------|
| Domineering | 4.33 | 4 | 3.64 | 0.82 | 0.25 | 0.13 | <0.001 |
| Vindictive | 6.28 | 6 | 4.74 | 0.32 | -0.98 | 0.10 | <0.001 |
| Cold | 6.31 | 6 | 4.62 | 0.32 | -.089 | 0.10 | <0.001 |
| Socially avoidant | 5.61 | 5 | 4.02 | 0.45 | -0.38 | 0.09 | <0.001 |
| Non-assertive | 5.90 | 6 | 4.06 | 0.32 | -0.68 | 0.09 | <0.001 |
| Exploitable | 9.61 | 5 | 4.14 | 0.43 | -0.35 | 0.09 | <0.001 |
| Overnurturant | 5.56 | 10 | 3.61 | -0.40 | -0.50 | 0.10 | <0.001 |
| Intrusive | 6.40 | 6 | 3.74 | 0.17 | -0.51 | 0.09 | <0.001 |

Note: K-S= Kolmogorov-Smirnov test; skew= skewness; Kurt= kurtosis

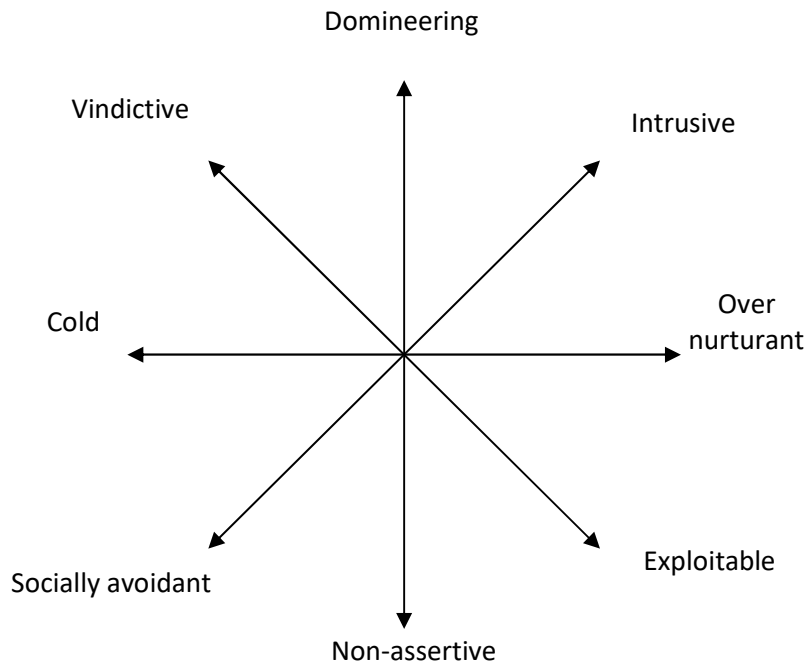
Factor analysis of Inventory of Interpersonal Problems-32

Inventory of Interpersonal Problems- 32 (IIP-32) has eight subscales that measure problematic interpersonal relationship styles and an aggregate score can also be obtained (Horowitz, Alden, Wiggins, & Pincus, 2000). Existing literature on IIP-32 reported that circumplex structure existed in the inventory with circular geometric representation of eight subscales with two orthogonal axis (agentic and communion). The subscales are placed on points on a circle which are equidistant from adjoining subscales ($r = 0.7$) and

center (Acton & Revelle, 2004; Vittengl, Clark, & Jarrett, 2003), as shown in the following figure.

Figure 4. 6

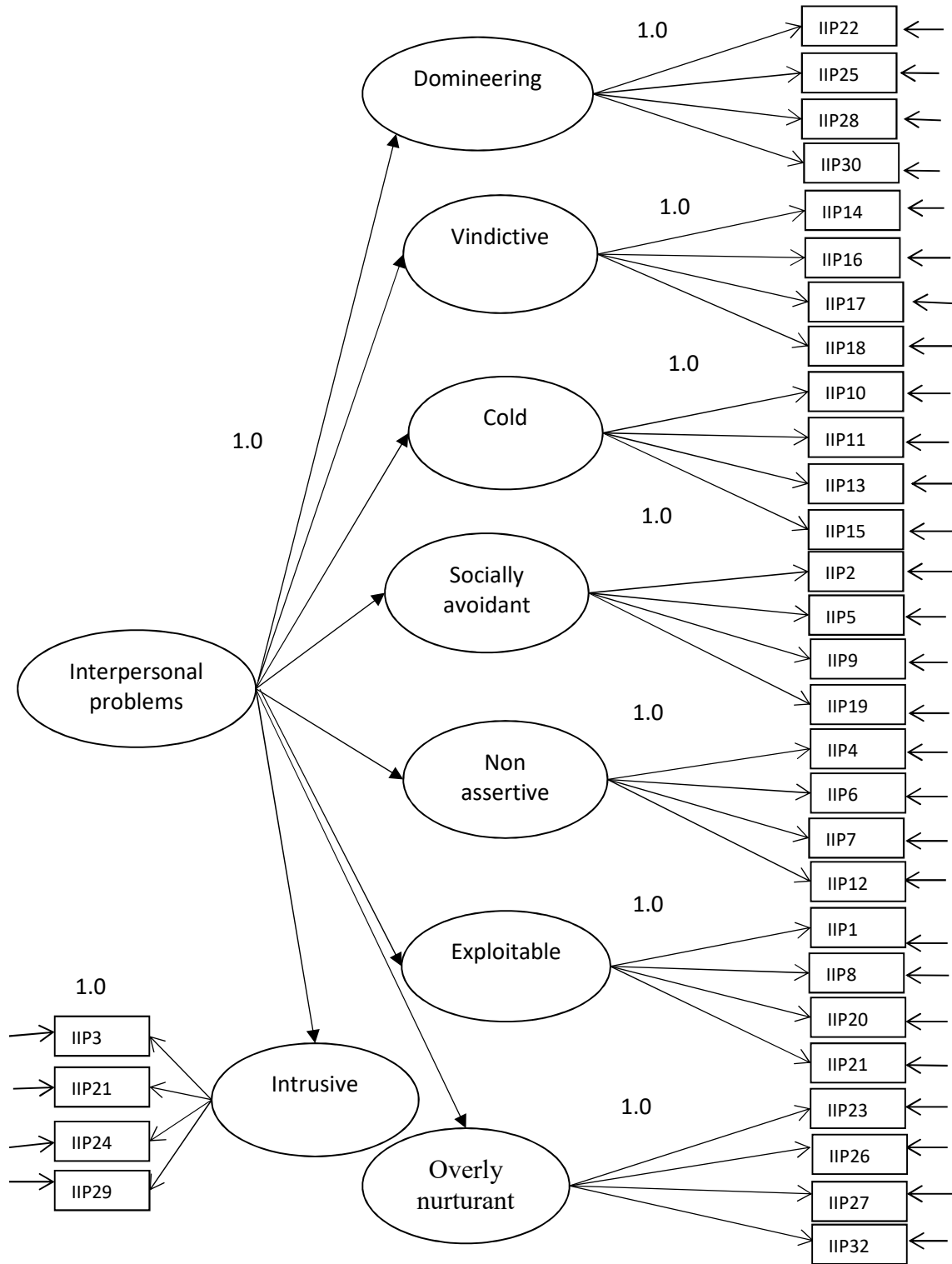
Diagrammatic presentation of subscales of Inventory of Interpersonal Problems-32 (IIP-32).



The original eight factor model was subjected to a priori second order confirmatory factor analysis. A total of four observed indicators were used to predict each of the eight latent factors which in turn were hypothesized to predict one second order latent factor. The hypothesized model is presented in the following figure.

Figure 4. 7

Hypothesized factor structure of Inventory of Interpersonal Problems-32 (IIP-32).



The distribution of each observed indicator in terms of mean (M) and standard deviation (SD) is presented in the following table.

Table 4. 9

Pooled mean (M) and standard deviation (SD) of observed indicators of Inventory of Interpersonal Problems-32 (IIP-32) ($N=1290$).

| Indicators | M | SD |
|--|-----------------------|------------------------|
| Domineering | | |
| IIP22. I am too aggressive toward other people | 1.15 | 1.32 |
| IIP25. I try to control other people too much | 1.43 | 1.47 |
| IIP28. I manipulate other people too much to get what I want | 0.91 | 1.32 |
| IIP30. I argue with other people too much | 0.94 | 1.30 |
| Vindictive | | |
| Find it hard to: | | |
| IIP14. Be supportive of another person's goals in life | 1.61 | 1.52 |
| IIP16. Really care about other people's problems | 1.61 | 1.50 |
| IIP17: Put somebody else's needs before my own | 1.67 | 1.56 |
| IIP18: Feel good about another person's happiness | 1.54 | 1.66 |
| Cold | | |
| Find it hard to: | | |
| IIP10: Show affection to people | 1.82 | 1.64 |
| IIP11: Get along with people | 1.38 | 1.50 |
| IIP13: Experience a feeling of love for another person | 1.67 | 1.56 |
| IIP15: Feel close to other people | 1.60 | 1.48 |

| Indicators | <i>M</i> | <i>SD</i> |
|--|-----------------|------------------|
| Socially avoidant | | |
| Find it hard to: | | |
| IIP2: Join in on groups | 1.47 | 1.45 |
| IIP5: Introduce myself to new people | 1.50 | 1.51 |
| IIP9: Socialize with other people | 1.22 | 1.44 |
| IIP19: Ask other people to get together socially with me | 1.55 | 1.51 |
| Non-assertive | | |
| Find it hard to: | | |
| IIP4: Tell a person to stop bothering me | 1.32 | 1.53 |
| IIP6: Confront people with problems that come up | 1.67 | 1.49 |
| IIP7: Be assertive with another person | 1.58 | 1.45 |
| IIP12: Be firm when I need to be | 1.49 | 1.53 |
| Exploitable | | |
| Find it hard to: | | |
| IIP1: Say "no" to other people | 1.55 | 1.38 |
| IIP8: Let other people know when I am angry | 1.45 | 1.53 |
| IIP20: Be assertive without worrying about hurting the other person's feelings | 1.68 | 1.56 |
| IIP31: I let other people take advantage of me too much | 0.10 | 1.35 |
| Over nurturant | | |
| IIP23: I try to please other people too much | 3.07 | 1.30 |
| IIP26: I put other people's needs before my own too much | 2.37 | 1.47 |
| IIP27: I am overly generous to other people | 1.10 | 1.48 |
| IIP32: I am affected by another person's misery too much | 2.27 | 1.54 |
| Intrusive | | |
| IIP3: Keep things private from other people | 1.58 | 1.63 |

| Indicators | M | SD |
|--|----------|-----------|
| IIP21: I open up to people too much | 2.07 | 1.54 |
| IIP24: I want to be noticed too much | 1.84 | 1.58 |
| IIP29: I tell personal things to people too much | 1.05 | 1.38 |

Note: IIP= Inventory of Interpersonal Problems.

Hypothesized Model

The model fit indices indicate that the hypothesized model was a poor fit (*MLM* mean $\chi^2 = 1559.51$; $df = 456$; $CFI = 0.77$; $RMSEA = 0.06$). Hence, an alternative model was drawn based on theoretical assumptions and modification indices.

Final model

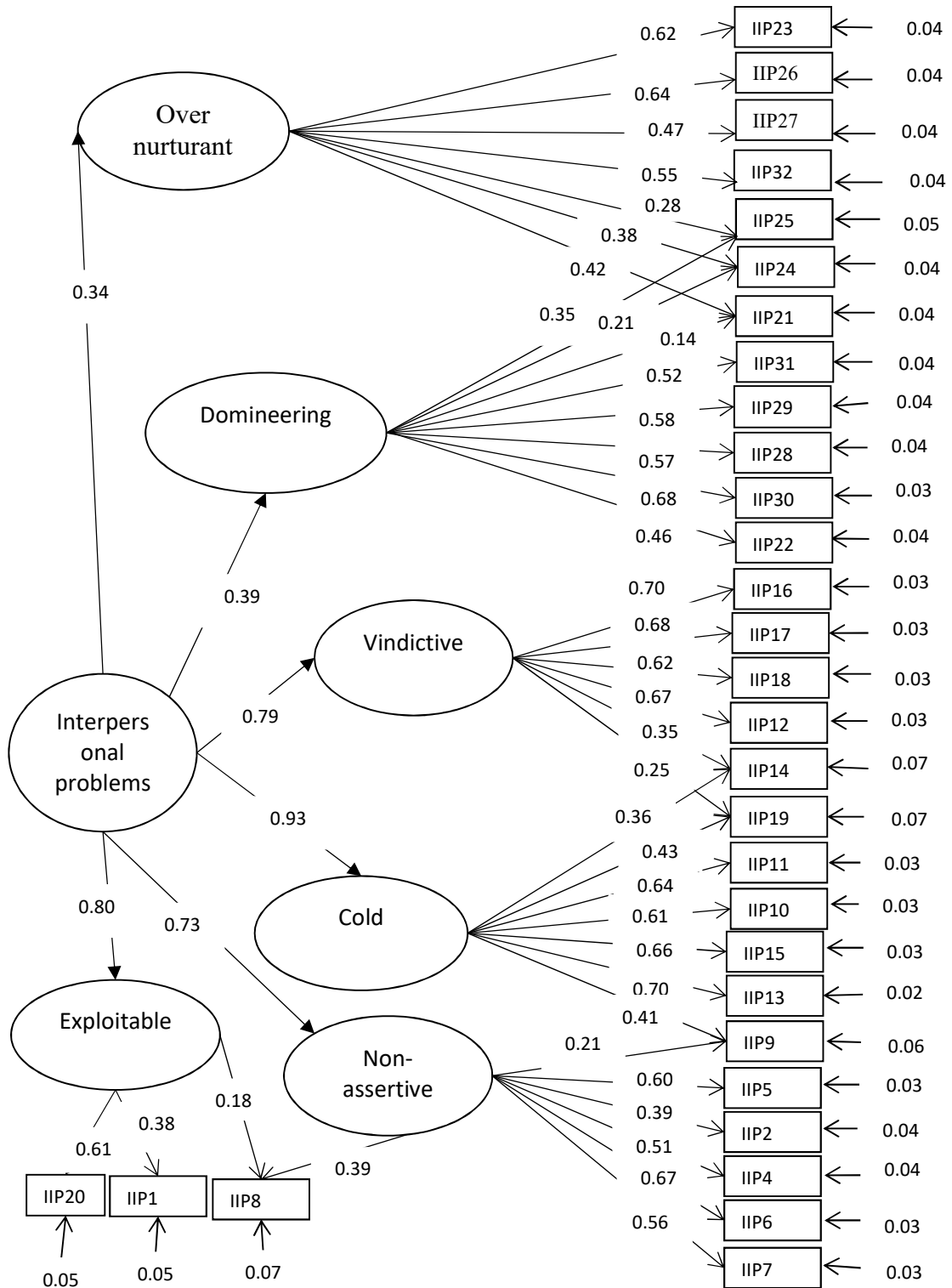
The final model consisted of 31 indicators, six latent factors and 106 free parameters. The overall model fit of the final model was good (*MLM* mean $\chi^2 = 861.16$, $df = 421$). In addition the mean CFI was 0.91 and mean $RMSEA$ was 0.04. In the final model only six latent factors emerged; domineering, vindictive, cold, non-assertive, exploitable and over nurturant. Items of the two disappearing subscales (intrusive and socially avoidant) loaded onto their neighboring subscales in accordance with the theory of circumplex structure and modification indices. IIP-32 scale is known to have circumplex structure in which the subscales placed closer to one another are more closely related than others. Items from intrusive subscale loaded onto over nurturant and domineering subscales. IIP21 and IIP24 loaded onto both over nurturant and domineering. IIP29 loaded onto domineering only. As IIP3 showed negative covariance with other

indicators it was excluded from the model. In case of socially avoidant subscale, IIP2 and IIP5 loaded onto non-assertive, IIP19 loaded onto cold and vindictive. IIP9 loaded onto both non-assertive and cold.

Three other items showed cross loadings onto neighboring subscales. IIP8 loaded both onto non-assertive and exploitable; IIP14 loaded onto both cold and vindictive; and IIP25 loaded both onto over nurturant and domineering. Finally, IIP12 loaded only onto domineering rather than non-assertive. The standardized loadings of indicators for each subscale were moderate in magnitude. The smallest standardized estimate was of IIP21 (0.14, $p < 0.001$). The remaining estimates for the standardized regression weights ranged from 0.18 (IIP8) to 0.70 (IIP13 and IIP16). IIP1 had lowest R^2 statistic (0.14, $p < 0.001$). The remaining variables had significant R^2 statistics that ranged from 0.15 (IIP2) to 0.49 (IIP13). The standardized loadings of the subscales on the second order latent factor (overall interpersonal problems) ranged from 0.34 (over nurturant) to 0.93 (cold) and R^2 statistics ranged from 0.11 (over nurturant) to 0.86 (cold). The diagrammatic presentation of the final model with standardized loading is presented in the following figure.

Figure 4. 8

Obtained factor structure of Inventory of Interpersonal Problems-32 (IIP-32).



Following table presents the variance explained by each indicator as R^2 .

Table 4. 10

Variance accounted (R^2) by indicators of Inventory of Interpersonal Problems-32 (IIP-32) (N=1290).

| Indicators | R^2 | <i>SE</i> |
|-------------------|-------------------------|------------------|
| IIP1 | 0.14** | 0.04 |
| IIP2 | 0.15** | 0.03 |
| IIP4 | 0.26** | 0.04 |
| IIP5 | 0.36** | 0.04 |
| IIP6 | 0.46** | 0.04 |
| IIP7 | 0.32** | 0.04 |
| IIP8 | 0.26** | 0.04 |
| IIP9 | 0.33** | 0.03 |
| IIP10 | 0.38** | 0.04 |
| IIP11 | 0.42** | 0.04 |
| IIP12 | 0.44** | 0.04 |
| IIP13 | 0.49** | 0.04 |
| IIP14 | 0.43** | 0.03 |
| IIP15 | 0.44** | 0.04 |
| IIP16 | 0.49** | 0.04 |
| IIP17 | 0.46** | 0.04 |
| IIP18 | 0.39** | 0.04 |
| IIP19 | 0.41** | 0.03 |
| IIP20 | 0.38** | 0.06 |

| Indicators | R^2 | SE |
|-----------------------|-------------------------|------------------------|
| HP21 | 0.21** | 0.03 |
| HP22 | 0.21** | 0.04 |
| HP23 | 0.38** | 0.04 |
| HP24 | 0.21** | 0.03 |
| HP25 | 0.23** | 0.03 |
| HP26 | 0.41** | 0.04 |
| HP27 | 0.22** | 0.04 |
| HP28 | 0.33** | 0.04 |
| HP29 | 0.33** | 0.04 |
| HP30 | 0.46** | 0.04 |
| HP31 | 0.27** | 0.04 |
| HP32 | 0.30** | 0.04 |
| Over nurturant | 0.11** | 0.03 |
| Domineering | 0.15** | 0.04 |
| Vindictive | 0.62** | 0.05 |
| Cold | 0.86** | 0.05 |
| Non-assertive | 0.53** | 0.05 |
| Exploitable | 0.65** | 0.1 |

Note: $p < 0.001$

IIP-32: DISCUSSION

The factor structure hypothesized in the present study was based on circumplex model. Nevertheless, the *CFI* (0.77) and *RMSEA* (0.06) of the hypothesized model indicated that it did not stand well for the translated version of IIP-32 in this Pakistani adolescent sample. However, there were some similarities as the final model (*CFI* = 0.91 and *RMSEA* = 0.04) comprised of mutually correlated uni-dimensional subscales which measured discrete concepts. This is similar to various exiting studies (for example, Vanheule, Desmet, & Rosseel, 2006; Barkham, Hardy & Startup, 1996). Yet, different subscales showed different strengths of correlations with the second order latent factor (overall IIP-32) that ranged from 0.34 – 0.93 which is in contrast to Acton and Revelle, (2004), and Vittengl, Clark and Jarrett's (2003) conclusions of circumplex structure.

Other indications about IIP-32 model's deviation from a perfect circular pattern in its circumplex structure comes from (1) submerging of subscales and (2) cross loading of items. With respect to submerging of subscales in this study, only 6 subscales emerged; over nurturant, domineering, vindictive, cold, non-assertive and exploitable. This is in contrast to exiting research (Acton & Revelle, 2004; Vanheule, Desmet, & Rosseel, 2006; Barkham, Hardy, & Startup, 1996). The items of the two subscales that disappeared (socially avoidant and intrusive), submerged into neighboring subscales. The loading pattern of items of socially avoidant subscale might be an expression of the cultural set up of Pakistan. Pakistan is a society in transitional state (moving from collectivistic to individualistic culture) where group affiliation is still encouraged in many respects (Khan,

2007). The presence of problems expressed in IIP2 (find it hard to join in on groups), IIP5 (find it hard to introduce myself to new people), IIP9 (find it hard to socialize with other people) and IIP19 (find it hard to ask other people to get together socially with me) are more indicative of being cold and vindictive rather than being socially avoidant or shy. The fact that these items still contributed to the factor structure of problematic interpersonal relationship styles shows that similar to Western cultures excess of these factors is considered problematic in Pakistan although, they might be labelled as a different kind of problem.

Similarly, disappearance of intrusive subscale can also be seen as embedded in the cultural context in terms of the extent to which individuals allow access to their inner selves (specific verses diffused). Pakistan has diffused culture where different aspects of life overlap for example, professional and personal (Thomas, 2008). Hence, intrusiveness may not be something that can be considered as problematic in Pakistan and is more often labelled as ‘concern’. Whereas being over nurturant and domineering are more recognized as problematic patterns. By the same argument the negative covariance showed by IIP3 (find it hard to keep things private from other people) can be explained. Since Pakistan has diffused culture, keeping things private from others is not a concern that falls consistent with other items of IIP-32.

Now to address the cross loading of some of the IIP-32 items onto the neighboring subscales, it can be seen that it is indicative of the differential conceptual closeness between the neighboring subscales that do not vary linearly with the distance on the circle.

For example, IIP8 (find it hard to let other people know when I am angry) belonging to exploitable subscale in the English version, loaded onto non-assertive subscale (placed after intrusive on the circle) rather than its immediate neighbors, intrusive and over nurturant subscales. Whereas, IIP14 (find it hard to be supportive of another person's goals in life) belonging to vindictive subscale in the English version, loaded onto cold subscale (its immediate neighbor in the circumplex structure). These cross loadings are also suggestive of cultural interpretations associated with these indicators.

Another interesting cross loading pattern was found for IIP12 (find it hard to be firm when I need to be) of non-assertive subscale which loaded onto the domineering subscale (situated on the opposite side in the circumplex geometric place). According to the interpersonal circumplex model (Horowitz, Wilson, Turan, Zolotsev, Constantino, & Henderson, 2006) interpersonal motives are responsible for establishing, maintaining or modifying an individual's interpersonal behaviors. In this context, interpersonal problems are reflective of enduring frustrations of interpersonal goals. Using two broad abstract categories (agency and communion) to define eight interpersonal motives within interpersonal circumplex model Thomas, Kirchmann, Suess, Utigam and Strauss (2012) studied the association of interpersonal motives with interpersonal problems. They defined an agentic motive to be emphasizing self as a discrete entity, determined to influence and control other people. Whereas communion motive is focused on connection and solidarity with others. The study hypothesized that interpersonal motive frustrations are associated with interpersonal relationship problems. Analysis of 258 in-patients undergoing psychotherapy for various mental health problems such as depression and anxiety

indicated that agentic (I appear confident) and agentic separate (I appear forceful) were positively correlated with domineering interpersonal relationship problem. It was concluded that where agentic motive is not properly fulfilled it could lead to domineering interpersonal relationship problem. The same argument can be applied in the present study to understand the factor loading of IIP12 (find it hard to be firm when I need to be). Those who have domineering interpersonal relationship style may believe that they are not firm enough when they need to be. This leads to agentic motive frustration which in turn results in expressing more domineering position to show that they are firm enough. Loading of this item on domineering subscale indicates that individuals with domineering interpersonal problems might believe that they are not firm enough and proceed their domineering behaviors to a problematic extent.

To conclude, the subscales did not produce an exact replicate of the previously reported circumplex structure of IIP however, the existence of correlations between subscales, factor loading of subscales on to a single IIP-32 latent factor and the successful use of the circumplex guide for formulating final model with adequate *CFI* and *RMSEA* indicates that the underlying theory of IIP-32 is applicable to Urdu translated version in Pakistani adolescent sample, after adaptations.

5. DEPRESSION AND ANXIETY: HOSPITAL DEPRESSION AND ANXIETY SCALE (HADS)

In this sample depression and anxiety were measured by Hospital Anxiety and Depression Scale (HADS). Mean and median for depression were 5.76 and 5 respectively

with standard deviation of 3.12. For anxiety subscale, mean, median and standard deviations were 7.31, 7 and 4.12, respectively. Scores ranged from 0 - 19 for depression and 0 – 20 for anxiety. Both depression ($K-S = 0.1, p < 0.001$) and anxiety ($K-S = 0.07, p < 0.001$) showed non normal distribution with 0.52 and 0.3 skewness and 0.29 and -0.36 kurtosis, respectively. The following table provides information on scores of respondents experiencing mild, moderate and severe depression and anxiety.

Table 4. 11

Total number and percentage of depression and anxiety as measured by Hospital Anxiety and Depression Scale (N=1290).

| Variables and categories | N (%) |
|--------------------------------------|--------------|
| Depression | |
| Normal (< 8) | 933 (72.4) |
| Mild depression (8 – 10) | 274 (21.3) |
| Moderate depression (11 – 14) | 67 (5.2) |
| Severe depression (15 – 21) | 14 (1.1) |
| Anxiety | |
| Normal (< 8) | 676 (52.5) |
| Mild anxiety (8 – 10) | 327 (25.4) |
| Moderate anxiety (11 – 14) | 219 (17) |
| Severe anxiety (15 – 21) | 66 (5.1) |

Over all, anxiety was reported by more adolescents than depression. A total of 197 (15.27%) respondents indicated presence of both depression and anxiety.

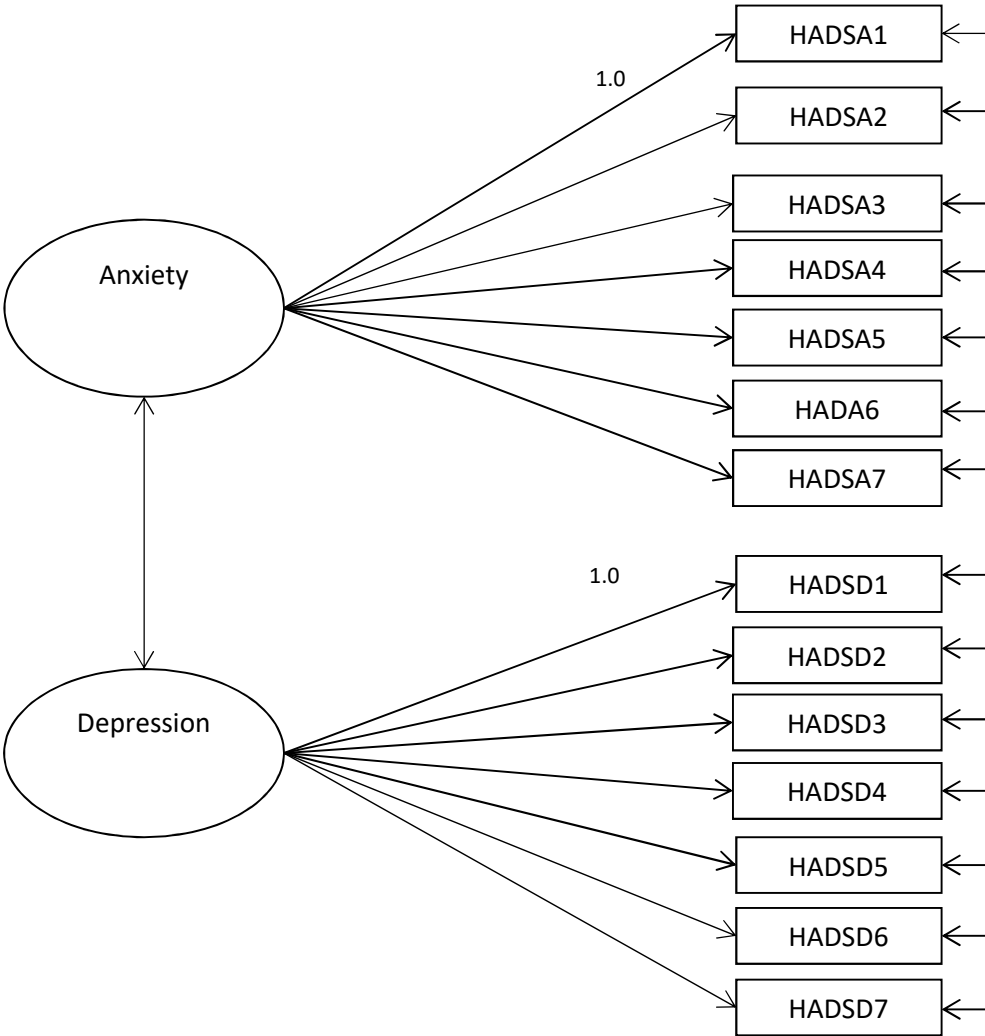
Factor analysis of Hospital Anxiety and Depression Scale

In this study, all 14 items were used from Hospital Depression and Anxiety Scale.

The hypothesized model is presented in the following figure.

Figure 4. 9

Hypothesized factor structure of Hospital Anxiety and Depression Scale (HADS).



The original two factor model was subjected to a priori confirmatory factor analysis. Seven indicators were hypothesized for predicting anxiety and seven for depression. The distribution of scores on individual items for depression and anxiety are presented in terms of mean and standard deviation in the following table.

Table 4. 12

Pooled mean (M) and standard deviations (SD) of indicators of Hospital Anxiety and Depression Scale (N=1290).

| Indicators | M | SD |
|---|----------|-----------|
| Anxiety | | |
| HADSA1: I feel tense and ‘wound up’ | 1.05 | 1.15 |
| HADSA2: I get a sort of frightened feeling as if something awful is about to happen | 1.26 | 1.16 |
| HADSA3: Worrying thoughts go through my mind | 1.04 | 1.03 |
| HADSA4: I can sit at ease and feel relaxed | 0.71 | 0.85 |
| HADSA5: I get a sort of frightened feeling like ‘butterflies’ in the stomach | 0.81 | 0.88 |
| HADSA6: I feel restless as if I have to be on the move | 1.38 | 1.02 |
| HADSA7: I get sudden feelings of panic | 1.17 | 1.06 |
| Depression | | |
| HADSD1: I still enjoy the things I used to enjoy as much | 0.92 | 0.99 |
| HADSD2: I can laugh and see the funny side of things | 0.62 | 0.94 |
| HADSD3: I feel cheerful | 0.55 | 0.68 |
| HADSD4: I feel as if I am slowed down | 1.02 | 0.79 |
| HADSD5: I have lost interest in my appearance | 1.20 | 1.19 |
| HADSD6: I look forward with enjoyment to things | 0.92 | 1.08 |
| HADSD7: I can enjoy a good book or radio or TV programme | 0.64 | 0.84 |

Hypothesized model

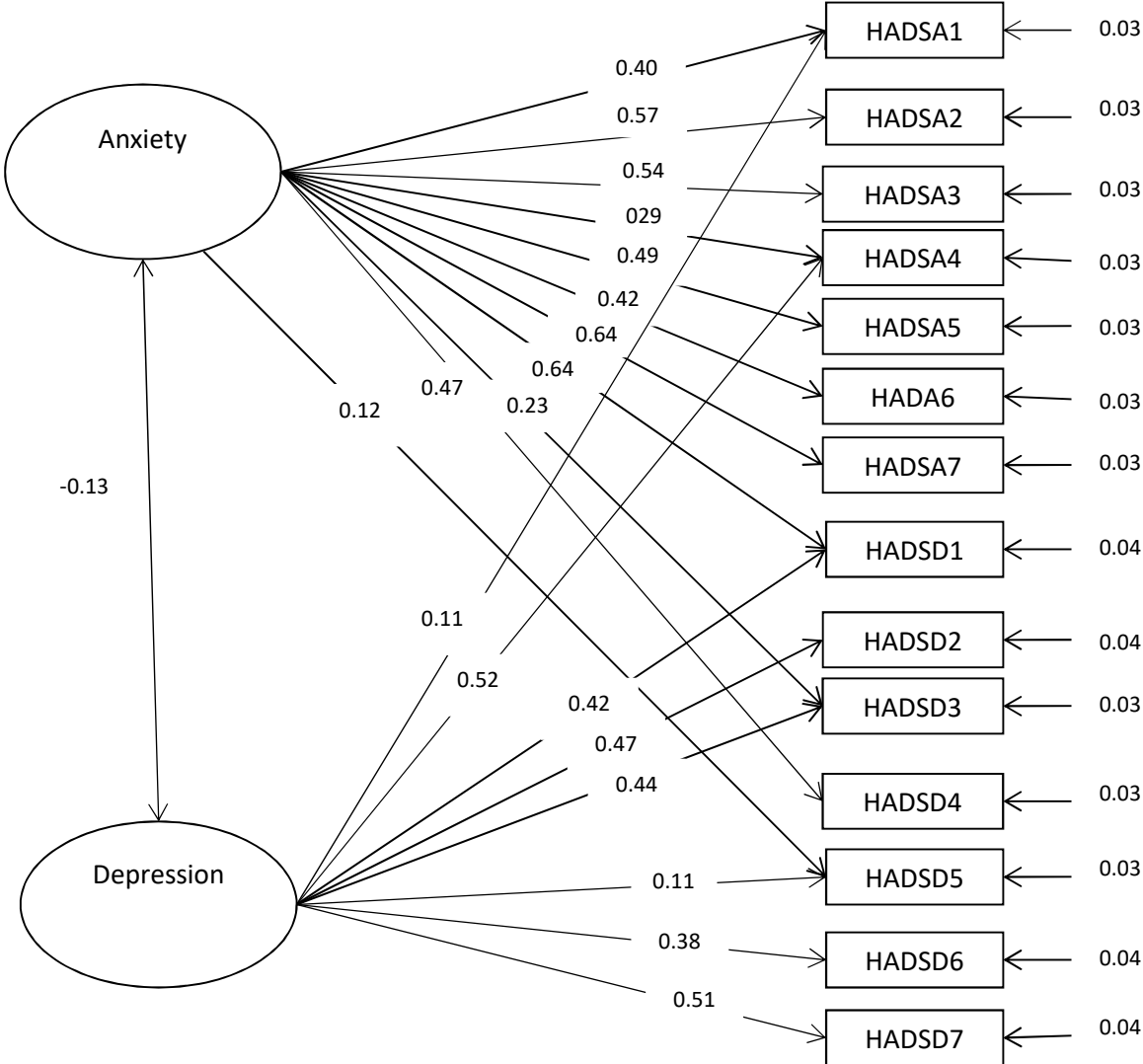
The overall model fit for the hypothesized model was poor (*MLM* mean $\chi^2 = 613.03$, $df = 76$) with 0.69 mean *CFI* and 0.07 mean *RMSEA*. Hence, an alternative model would be more appropriate.

Final model

The mean χ^2 value for the final model was 165.03 ($df = 71$) with 0.95 mean *CFI*, and mean *RMSEA* of 0.03. There were 14 indicators two latent variables and 48 free parameters. In the final model six indicators showed cross loadings. HADSA1, HADSA4, HADSD1, HADSD3 and HADSD5 loaded onto both depression and anxiety while HADSD4 loaded only onto anxiety. The smallest standardized estimates (0.11, $p < 0.001$) corresponded to the HADSA1 and HADSD5 (for loading onto depression). The remaining estimates for the standardized regression weights ranged from 0.14 for HADSD5 to 0.64 for HADSA7. Finally, the R^2 statistic for HADSD5 had the lowest value ($R^2 = 0.03$, $p < 0.05$). The remaining variables also had significant R^2 statistics ranging from 0.14 for HADSD6 to 0.41 for HADSA7. The two latent factors were significantly negatively correlated ($r = -0.13$). The factor loadings were statistically significant and the overall test of fit suggested that the model adequately fits the data. The diagrammatic presentation of the final model with standardized loading is shown in the following figure.

Figure 4. 10

Obtained factor structure of Hospital Anxiety and Depression Scale (HADS).



Following table presents the variance explained by each indicator as R^2 .

Table 4. 13

Variance accounted (R^2) by indicators of depression and anxiety (N=1290).

| Indicators | R^2 | SE |
|-------------------|-------------------------|------------------------|
| HADSA1 | 0.16** | 0.02 |
| HADSA2 | 0.33** | 0.03 |
| HADSA3 | 0.29** | 0.03 |
| HADSA4 | 0.32** | 0.04 |
| HADSA5 | 0.24** | 0.03 |
| HADSA6 | 0.18** | 0.02 |
| HADSA7 | 0.41** | 0.03 |
| HADSD1 | 0.19** | 0.03 |
| HADSD2 | 0.22** | 0.04 |
| HADSD3 | 0.22** | 0.03 |
| HADSD4 | 0.22** | 0.03 |
| HADSD5 | 0.03* | 0.01 |
| HADSD6 | 0.14** | 0.03 |
| HADSD7 | 0.26** | 0.04 |

Note: **= $p < 0.001$, * = $p < 0.05$; R^2 = variance; SE = standard errors.

HADS: DISCUSSION

Prevalence rates: In the present study, 26% of adolescents reported experiencing depressive symptoms and 47.5% reported symptoms of anxiety. These figures are 10% lower for depression and 13% higher for anxiety when compared to the average prevalence of anxiety and depression in Pakistani community (i.e., 34%) (Mirza & Jenkins, 2004). They are also higher than the rates reported by Khalid (2015) for adolescent depression (17.2%) and (21.4%) anxiety. These results show alarmingly high rate of depression and anxiety as compared to rates reported in other studies which were conducted in Western countries. For example, in United States rates of depression and anxiety among 3 – 17 years old individuals were found to be 2.1% and 3% respectively (Perou, et al., 2013). The rates of depression and anxiety of the present study are also much higher than the point prevalence reported in a global review by Merikangas, Nakamura and Kessler (2009). According to Merikangas, Nakamura and Kessler (2009), among children and adolescents rates for depression ranged from 0.6% in Great Britain to 3.0% in Puerto Rico; for anxiety, rates ranged from 2.2% in North Carolina to 9.5% in Puerto Rico.

In the present study, around 15% of adolescents reported both anxiety and depression symptoms. This could be due to a number of reasons. Firstly, comorbidity could be a property of the definition and indicators used for depression and anxiety. The factor analysis of HADS indicated high cross loadings, a sign of common/ shared indicators for recognition of depression and anxiety (discussed later in this section). It could also be a chance co-occurrence as both depression and anxiety are relatively high in

frequency. It is also possible that this comorbidity is an exhibition of one disorder occurring as a risk factor for another or both having common risk factors (Frances, Widiger, & Fyer, 1990).

Factor analysis: Two factor structure was obtained as a result of factor analyses. Unexpectedly, negative correlation was found between depression and anxiety in factor analysis ($r = -0.13$). Despite the fact that vast amount of literature is stressing the existence of common factors between depression and anxiety and consider it as a cause of their strong correlation, there is one study which asserted that some clinical features of depression and anxiety move in opposite directions (Xie et al., 2012). Xie and colleagues (2012) argued that both positive and negative correlations exist in depression and anxiety subscales of HADS due to both common and opposite directional factors. They used bifactor analysis method on data obtained from 503 pain patients (age ranged from 16 to 91 years with mean age = 47.21 years). After extraction of general factor of distress, the specific factors fundamental to anxiety and depression were significantly negatively correlated ($r = 0.245$), though this correlation was weak (Xie et al., 2012). The presence of a general factor and distinct factors is also recognized by Clark and Watson (1991). Clark and Watson (1991) attributed the strong covariation between anxiety and depression to negative affect and considered this as general distress factor. Low positive affect (anhedonia) and anxious arousal were proposed as distinguishing factors for depression and anxiety, respectively. In the present study, it is possible that after cross loadings of many items of depression and anxiety, the effect of opposite directional factors surfaced

resulting in negative correlation between depression and anxiety. Further research is required to ascertain this reasoning.

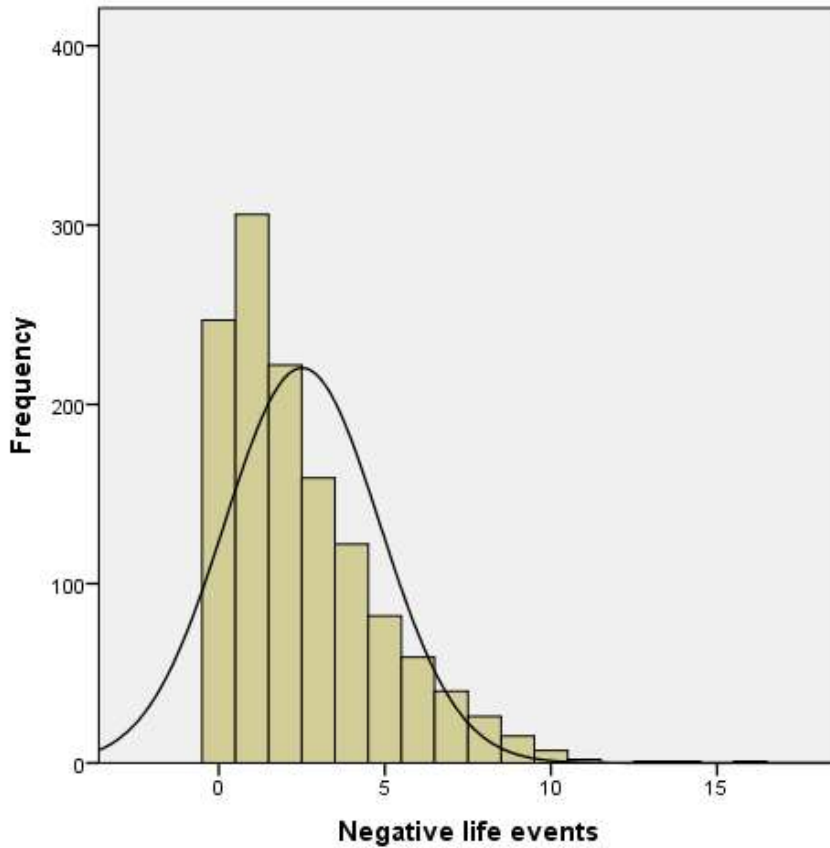
This study also demonstrated that two factor structure ($RMSEA=0.03$; $CFI=0.95$) fitted well with the Urdu version of the HADS scales. This is in line with the two factor structure proposed by the authors of the scale (Zigmond & Snaith, 1983) and several other Western studies (Mykletun, Stordal, & Dahl, 2001; Cosco, Doyle, Ward, & McGee, 2012). A similar two factor structure was also found in a recent study conducted in Pakistani population by Qadir, Khalid, Haqqani, Huma and Medhin (2013) on 277 married women living in the community. Qadir, Khalid, Haqqani, Huma and Medhin (2013) also used the same Urdu version of the scales as used in the present study and reported cross loadings of two items (HADSD4 and HADSA4). In present study in addition to these two items, several other items showed cross loadings. As stated earlier, these cross loadings could be explained as a function of the shared general factor of distress between depression and anxiety (Xie et al., 2012). A systematic review of previous studies on HADS also reported cross loadings of items (Cosco, Doyle, Ward, & McGee, 2012). For example, out of the studies appraised in the systematic review, Mykletun, Stordal and Dahl (2001) study showed that HADSA4 of anxiety and HADSD3 of depression loaded substantially onto the other subscale; similar to the present study. However, literature also propagates that despite these anomalous loadings HADS hold valuable position as predictor of one year morbidity and mortality (Doyle, Conroy, McGee, & Delaney, 2010). To conclude, after modifications HADS showed satisfactory factor structure in the present study.

6. NEGATIVE LIFE EVENTS: NEGATIVE LIFE EVENTS SCALE FROM CASE

Total score for negative life events ranged from 0 to 17 with 2.51 mean, 2 median and 2.34 standard deviation. The skewness and kurtosis values were 1.25 and 1.85 respectively. Kolmogorov-Simonov test indicated non normal ($K-S = 0.19, p < 0.001$) distribution. A histogram showing distribution of total score on negative life events is presented in the following figure.

Figure 4. 11

Histogram of total scores on Negative Life Events scale (LES) with superimposed normal curve (N= 1290).



The most frequently reported negative life event was death of a close person (68.8%) followed by serious illness or accident of a family member (33.5%) and death of a family member (28%). The frequencies and percentages of all negative life events reported by adolescents is presented in the following table.

Table 4. 14*Total number (N) and percentages (%) of negative life events experienced (N=1290).*

| Negative Life events | N (%) |
|--|--------------|
| LES1: Problems keeping up with school work | 195 (15.4) |
| LES2: Difficulty in making or keeping friends | 137 (10.7) |
| LES3: Had any serious arguments or fights with friends | 212 (16.7) |
| LES4: Had any serious problems with a boyfriend or girlfriend | 95 (7.6) |
| LES5: Parents separated or divorced | 24 (1.9) |
| LES6: Had any serious arguments or fights with parents | 74 (5.8) |
| LES7: Parents had any serious arguments or fights | 84 (6.6) |
| LES8: Family member had a serious illness or accident | 425 (33.5) |
| LES9: Close friend had a serious illness or accident | 228 (18.1) |
| LES10: Have been seriously physically abused | 30 (2.4) |
| LES11: Have been in any trouble with the Police | 57 (4.4) |
| LES12: Death of immediate family member | 356 (28.1) |
| LES13: Death of close person | 873 (68.9) |
| LES14: Family member or close friend committed suicide | 77 (6) |
| LES15: Family member attempted suicide or deliberately harmed themselves | 82 (6.4) |
| LES16: Close friend attempted suicide or deliberately harmed themselves | 66 (5.1) |
| LES17: Experienced sexual abuse | 44 (3.4) |
| LES18: (A) Other distressing events | 167 (13) |

Missing values: LES1=25; LES2=12; LES3=22; LES4=34; LES5=24; LES6=25; LES7=19; LES8=23; LES9=31; LES10=23; LES11=7; LES12=21; LES13=23; LES14=7; LES15=4; LES16=7; LES17=4; LES18=10.

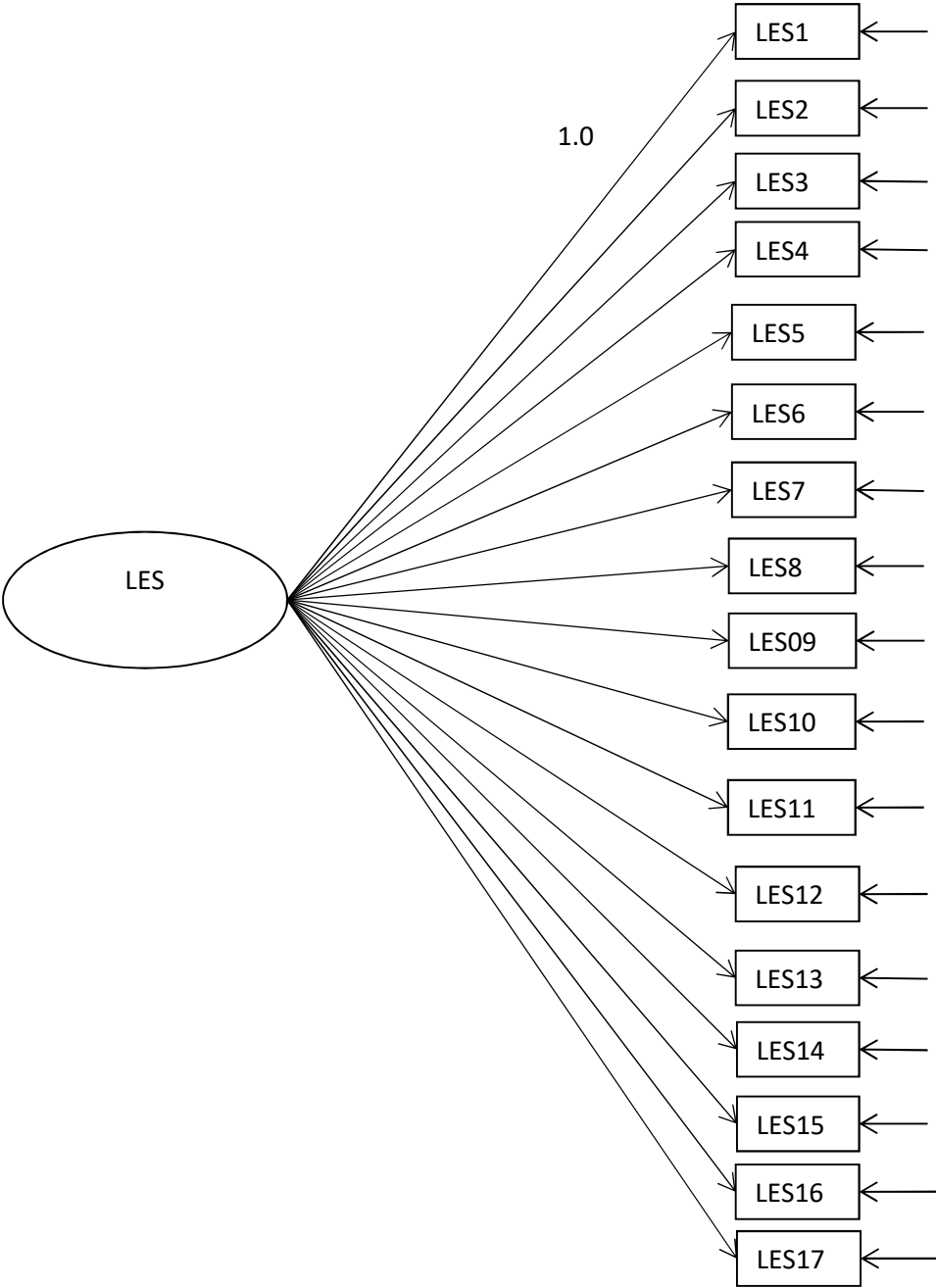
The total scores were calculated by adding item 1 to 17. Item 18 was not included in the total score because majority of the adolescents provided an explanation for one of the events already asked in items 1 to 17. It was not possible to verify whether this explanation was for the item 18 or another event. Responses of ten respondents indicated that they did not understand this question and 130 did not answer item 18. Only 26 respondents provided details of the negative life event indicated in item 18, and the explanations which were clearly different from the perilously asked negative life events. The explanations included being falsely accused (e.g., for being in a socially unapproved relationship or involvement in socially unacceptable task) ($N = 7$), forced engagement ($N = 1$), family disputes ($N = 2$), sister experiencing marital abuse ($N = 1$), relatives efforts to stop respondent from going to school ($N = 1$), violence related experiences ($N = 10$) (including 6 kidnappings, 1 murder and 3 physical abuse cases of relatives), and peer pressure to smoke and have boyfriends ($N = 2$).

Factor Analysis of Life Events Scale

Life events scale (LES) consists of 17 items. The single factor hypothesized model presented in the following figure was subjected to first order exploratory factor analysis.

Figure 4. 12

Hypothesized factor structure of negative life events scale (LES).



Hypothesized Model

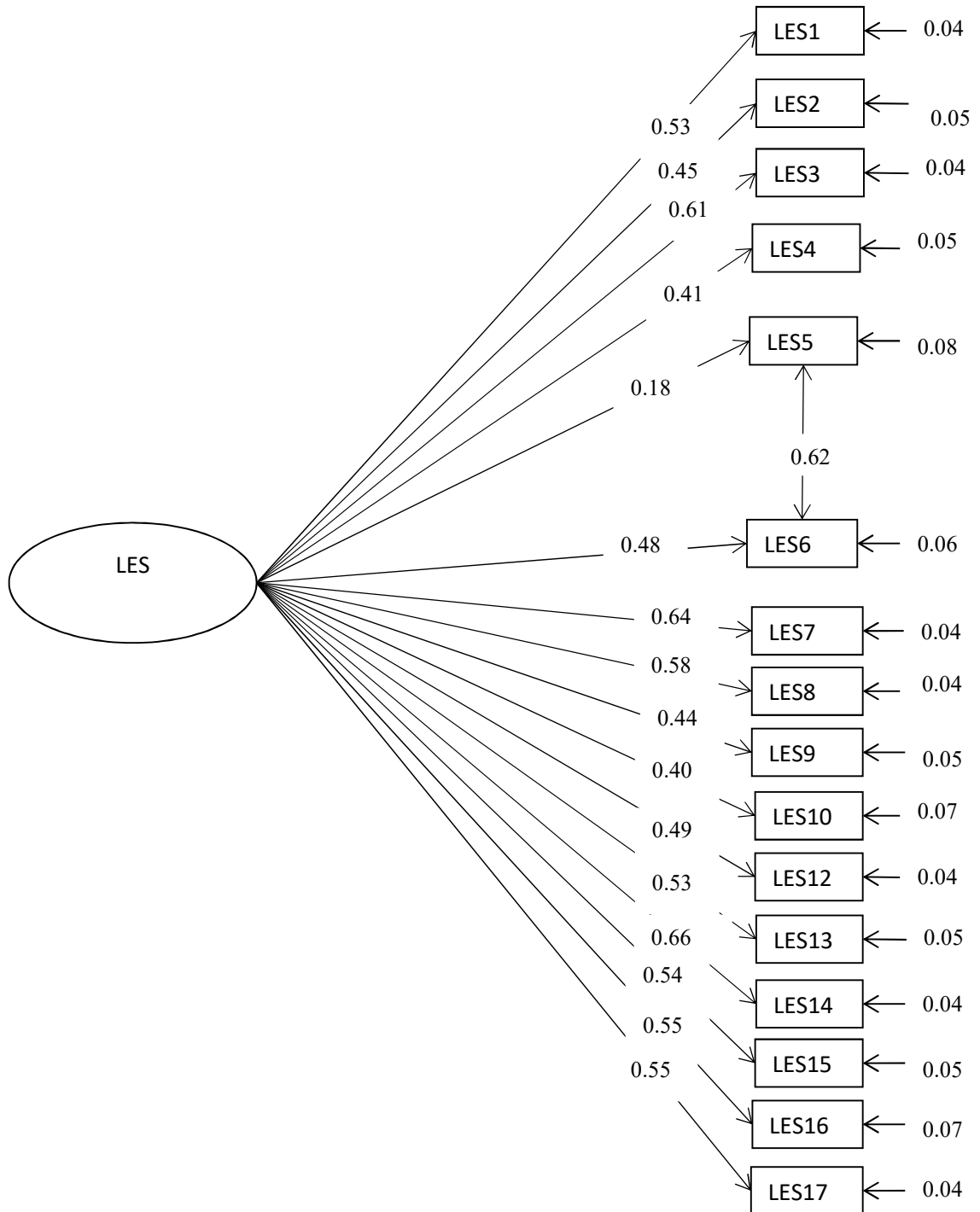
The overall model fit was poor (*MLM* mean $\chi^2 = 303.23$, $df = 104$) with 0.88 mean *CFI* and 0.04 mean *RMSEA*. The overall test of fit suggested that the hypothesized model did not adequately fit the data. Hence, an alternative model was built.

Alternate model

There were 16 indicators, 1 latent variable and 34 free parameters in the final model. The mean χ^2 value for this final model was 238.54 ($df = 103$) with 0.92 mean *CFI*, and 0.03 mean *RMSEA*. The smallest standardized estimate corresponded to the LES5 and is 0.18 ($p < 0.05$). The remaining estimates for the standardized regression weights ranged from 0.4 for LES11 to 0.66 for LES14. The lowest variance accounted for was shown by LES11 ($R^2 = 0.16$, $p < 0.05$). The remaining variables had R^2 statistics that ranged from 0.17 for LES4 to 0.52 for LES6. The factor loadings were statistically significant and the overall test of fit suggested that the model fitted the data well. In the final model LES6 showed correlations with LES7 (0.62, $p < 0.001$). LES11 was excluded from the final model due to its negative covariance. The diagrammatic presentation of the final model with standardized loading is presented in the following figure.

Figure 4. 13

Obtained factor structure of negative life events scale (LES).



Following table presents the variance (R^2) explained by each indicator.

Table 4. 15

Variance accounted (R^2) by each indicator of negative Life Events Scale (LES) (N=1290).

| Indicators | R^2 | <i>SE</i> |
|-------------------|-------------------------|------------------|
| LES1 | 0.28** | 0.05 |
| LES2 | 0.20** | 0.04 |
| LES3 | 0.37** | 0.05 |
| LES4 | 0.17** | 0.04 |
| LES5 | 0.52** | 0.08 |
| LES6 | 0.23** | 0.05 |
| LES7 | 0.41** | 0.05 |
| LES8 | 0.33** | 0.05 |
| LES9 | 0.19** | 0.05 |
| LES10 | 0.16** | 0.06 |
| LES11 | 0.24* | 0.04 |
| LES12 | 0.28** | 0.06 |
| LES13 | 0.43** | 0.06 |
| LES14 | 0.29** | 0.06 |
| LES15 | 0.29** | 0.07 |
| LES16 | 0.30** | 0.05 |

Note: **= $p < 0.001$; * $p < 0.05$; *SE* = standard error; R^2 = variance

LE: DISCUSSION

The factor structure of negative life events indicated (mean $CFI = 0.92$ and mean $RMSEA = 0.03$) that the items contributed well to produce latent variable of negative life events. The observed correlation between LES6 (had any serious arguments or fights with parents) and LES7 (parents had any serious arguments or fights) is indicative of the dysfunction in relationship between parents being closely related to dysfunction in relationship of parents and children. This is also in concordance with attachment theory postulates. According to Markiewicz, Doyle and Brendgen (2001) parents' marital conflict effects adolescents' attachment security to mother by decreasing the receptiveness and success of her childrearing practices.

7. FAMILY AFFLUENCE: FAMILY AFFLUENCE SCALE (FAS-II)

Family affluence (FA) was explored as part of demographic pro forma and descriptive statistics for family affluence are presented in chapter 3.

Factor analysis of Family Affluence Scale

In this study Family Affluences Scale (FAS-II), consisting of 4 items, was used. The distribution of scores on Family Affluence Scale-II items are presented in the form of pooled univariate proportions in the following table.

Table 4. 16

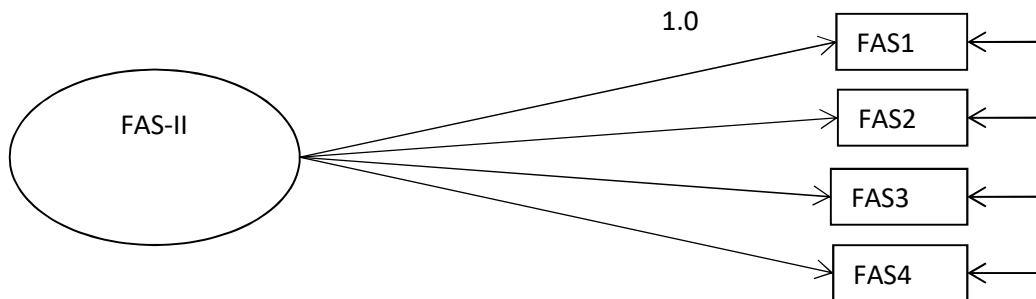
Univariate proportions of Family Affluence Scale (FAS-II) items. (N=1290).

| Indicators | No/None | 1/yes | More than 2 | |
|--|----------------|--------------|--------------------|--------------------|
| FAS1: Does your family own a motor bike car, van or truck (e.g., double cabin cars)? | 0.44 | 0.46 | 0.1 | |
| FAS2: Do you have your own bedroom for yourself? | 0.70 | 0.30 | | |
| Indicators | 0 | 1 | 2 | More than 2 |
| FAS3: During the past 12 months, how many times did you travel away on holiday with your family? | 0.27 | 0.29 | 0.16 | 0.28 |
| FAS4: How many computers does your family own? | 0.47 | 0.44 | 0.7 | 0.2 |

The hypothesized model is presented in the following figure.

Figure 4. 14

Hypothesized factor structure of Family Affluence Scale- II (FAS-II).



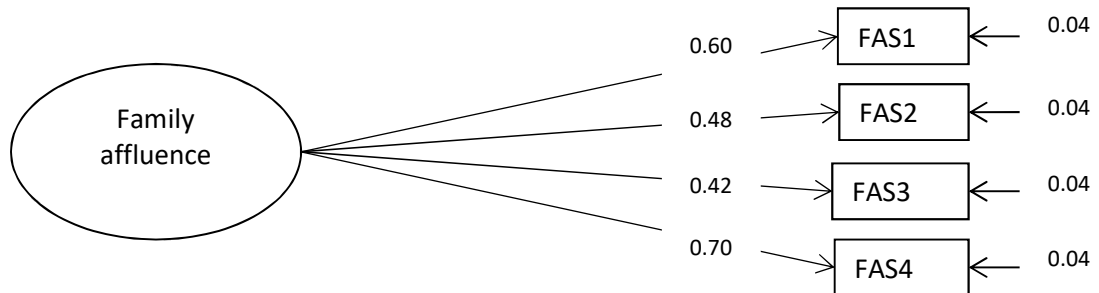
The original one factor model was subjected to a priori first order confirmatory factor analysis. There were 4 indicators, 1 latent variable and 13 free parameters.

Hypothesized/ Final Model

The overall model fit was good (*WLSMV* mean $\chi^2 = 10.48$, $df = 2$). In addition the mean *CFI* was 0.98 and mean *RMSEA* was 0.06. The standardized loadings of indicators were moderate in magnitude. The smallest standardized estimate (0.42, $p < 0.0001$) was of FAS3. The remaining estimates for the standardized regression weights ranged from 0.47 (FAS2) to 0.69 (BBC4). Finally, FAS3 had lowest R^2 statistics (0.17, $p < 0.0001$). The remaining variables also had significant R^2 statistics that ranged from 0.23 (FAS2) to 0.49 (FAS4). The diagrammatic presentation of the final model with standardized loadings is presented in the following figure.

Figure 4. 15

Obtained factor structure of Family Affluence Scale-II (FAS-II).



Following table presents the variance explained by each indicator as R^2 .

Table 4. 17

Variance accounted (R^2) by each indicator of Family Affluence Scale (FAS-II) (N=1290).

| Indicators | R^2 | SE |
|-------------------|-------------------------|------------------------|
| FAS1 | 0.36** | 0.05 |
| FAS2 | 0.23** | 0.04 |
| FAS3 | 0.17** | 0.03 |
| FAS4 | 0.49** | 0.06 |

Note: $p < 0.001$; SE = standard error; R^2 = variance.

FA: DISCUSSION

The CFI (0.98) and $RMSEA$ (0.06) of FAS-II showed that translated FAS-II adequately measured family affluence among Pakistani adolescents. The moderate factor loading (0.42) of item: “during the past 12 months, how many times did you travel away on holiday with your family”, indicated that in Pakistan family affluence was more signposted by material possessions. This is supported by other existing studies which have used only material affluence as an indication of parental socioeconomic status (Doku, Koivusilta, Rainio, & Rimpela, 2010). However, the significance of factor loadings of “family holidays” indicate that the family holidays also play important role in measuring family affluence.

CONCLUSION

In the present study, a number of instruments were translated into Urdu language. Adolescents were provided with a choice to answer questions in Urdu or English. A predominant majority ($N = 1286$) opted for Urdu. Furthermore in the demographic section of the questionnaire, it was also found that 55.9% adolescents could not understand English despite being taught English language as a compulsory course in schools and majority of their other course materials being in English. All of these observations support the need for using translated instruments.

An important challenge was to adapt the instruments to the needs of the bilingual population. This bilingual population was familiar with both Urdu and English language but did not have complete command over any of these languages. In accordance with Altarriba and Heredia (2008) suggestions, two points can be considered in this regard; (1) how well target population can speak, understand, read, and write in the two languages and (2) can target population use both languages equally well or one language more efficiently. The results of language skills and adolescents' preferences indicated that Urdu is stronger language for Pakistani adolescents. Hence, adolescents preferred to use Urdu sentences with incorporation of some English words (Brice, Shaunessy, Hughes, Mchatton, & Ratliff, 2008). In the present study, adolescents needed English words only when an appropriate word was not known to them in the base language. Therefore, bilingualism is an important consideration for adequacy of translation in research.

The translation and adaptation conducted in the present study has proved to be of particular significance as it provided a method of using and contextualizing already available information and instruments. This has also allowed to easily compare and contrast the model elements with the prior research and to develop a conceptual map. Study of DSH along a continuum with inclusion of hopelessness as an indicator, deviance of IIP-32 from the circumplex structure and validation of the variant structure within specific Pakistani context, negative covariance of subscales of HADS are among the unique contributions of the study.

LIMITATIONS

Following are the limitations of the present study.

1. To ensure the quality of translation, meticulous planning, time, skill, knowledge, and experience were invested in translation and adaptation of the questionnaire. However, to achieve balance of resources available, professional translators were not involved.
2. Due to limited resources it was not possible to test the criterion validity of the instruments which must be addressed in future research.
3. In addition the methods used to assess the adequacy of translation, adaptation and validation of the instruments, testing for test retest reliability is also recommended in the literature. However, this was beyond the scope and resources available for

the study. Therefore, future endeavours must include test retest reliability as an important component for examining the utility of these instruments.

RECOMMENDATIONS

Following are the recommendations made based on the results of translation, adaptation and validation of the instruments.

1. The translation and use of instruments in Urdu language in this study has established feasibility of their use with individuals whose preferred language of communication is Urdu. Thus, this study has established long term capacity for further research in terms of establishing reservoir of tools on wide range of topics encompassing both interpersonal and intrapersonal domains. Due to this internationally comparable research can now be conducted with these instruments.
2. In this thesis, several of the instruments exhibited variant factor structure than previous research. These results implied that this variation must be considered while using these instruments in future. It is also indicative of considering context specific variations in conducting any research in indigenous settings. Therefore, this study is unique in its nature to identify and highlight factors that are specific to Pakistani context.
3. This study also provides evidence that indicates need to expand the DSM-V

criteria for NSSI and suicidal behaviour disorder. Firstly, the results of the study indicate that it is not always possible to draw clear distinction between suicidal DSH and non-suicidal DSH (which is a requirement in DSM-V criteria) as a considerable overlap between suicidal and non-suicidal DSH was observed in the present study. This ambiguity is partially accommodated in DSM-V by devising a subcategory of NSSI, not otherwise specified (NOS), type 2 with uncertain intent. Nevertheless, in light of the result of the present study it needs to be explored further and included in both suicidal and non-suicidal DSH.

4. The study also recommends hopelessness as an important indicator of DSH. Thus, suggesting that interventions targeted at lowering the levels of hopelessness can be effective for DSH prevention.
5. With respect to clinical implication of this study with Urdu speaking populations, the translation of instruments has made it possible for the clinicians to use self-report instruments as a measure of achievement of therapeutic goals and for understanding therapeutic process. For example, interpersonal relationship style problems are identified as a common source of distress and often are the focus of the psychotherapy (Horowitz, 2004). Therefore, it is crucial to have an Urdu translated measure of interpersonal relationship problems which will help in identifying interpersonal relationship style problems, and measuring change in these problems during and after the therapy. It can also be used for understanding the nature of therapeutic alliance established in the therapy as a client's interpersonal style interact with the therapist's characteristics which in turn either stimulate or constrain therapeutic

change (Gurtman, 2004).

Thus, the translation and factors analyses conducted in this study served not only a valuable contribution to the progression of the present study but also provided tools for future research endeavors.

CHAPTER 5

ASSOCIATION OF ATTACHMENT AND DSH: MEDIATING AND MODERATING ROLE OF DEPRESSION, ANXIETY AND SOCIAL SUPPORT

Predictors of DSH have been explored through many different approaches. One approach is the investigation of correlates associated with DSH. These correlates can be broadly classified into intrapersonal and interpersonal factors (Nock, 2014). Among the intrapersonal correlates heightened state of negative emotions in the form of depression and anxiety have been found to be consistently associated with DSH (Kidger, Heron, Lewis, Evans & Gunnell, 2012; Brunner, Parzer, Haffner, Steen, Roos, Klett and Resch, 2007; Hawton, Rodham, Evans, & Weatherall, 2002; McMahon, Reulbach, Corcoran, Keeley, Perry, & Arensman, 2010). The consistent association of depression and anxiety symptoms indicates, their seminal importance in studying DSH; and it also stresses the need to include them in models studying correlates of DSH. An important concern that needs to be considered is how depression and anxiety are induced or what developmental and other factors make an adolescent more vulnerable to experiencing heightened states of negative emotions. According to attachment theory all development takes place in interpersonal context (Cassidy & Shaver, 2008) and therefore, interpersonal factors can serve as vulnerability to DSH. One such interpersonal factor is social support which has

been consistently associated with attachment and DSH (Cassidy & Shaver, 2008; Heath, Ross, Toste, Charlebois, & Nedecheva, 2009).

Among both intrapersonal and interpersonal correlates, attachment takes a unique place as; 1) it begins to formulate at birth; 2) it is both intrapersonal and interpersonal in nature and 3) it has the ability to influence all other developmental outcomes (Dubois-Comtois, Cyr, Pascuzzo, Lessard, & Poullin, 2013; Cassidy & Shaver, 2008) including other predictors of DSH (Erozkan, 2011; Cook, Heinze, Miller, & Zimmerman, 2016). These characteristics of attachment make it a breeding ground for adolescent development and enable it to serve as a framework for understanding developmental pathways of psychopathology among adolescents. Until recently, most of the work on attachment has focused on childhood and adulthood whereas, adolescence is relatively ignored in this respect (Dubois-Comtois, Cyr, Pascuzzo, Lessard, & Poullin, 2013). There is need to understand adolescent psychopathology and its predictors within attachment framework.

Attachment, depression, anxiety and social support, all have been studied as correlates of DSH in different studies however, they have rarely been studied in a unified model to understand their interaction and the resulting pathways leading to DSH. Therefore, in this chapter the association of depression, anxiety and social support with DSH will be discussed. The evidence for hypothesizing mediating and moderating interaction of depression, anxiety and social support will be studied within attachment framework. Influence of contextual variables (i.e. negative life events, age, gender and socioeconomic status) will also be briefly discussed.

DEPRESSION AND ANXIETY

Depression and anxiety are reported to be common mental disorders in adolescence (WHO 2014; Thapar, Collishaw, Pine, & Thapar, 2012). They are among the top 10 causes of years lost due to disability among adolescents (WHO, 2014). Depression has lifetime prevalence of 4% to 5.7% for adolescents (Costello, Erkanli, & Angold, 2006; Sabate, 2004) and anxiety has lifetime prevalence of 15 - 20% for children and adolescents (Beesdo, Knappe, & Pine, 2009). Among Pakistani adolescents 17.2% depression and 21.4% anxiety was reported in a recent study ($N=1124$) by Khalid (2015). Both depression and anxiety are associated with various maladaptive outcomes (Kendall et al., 2010; Kessler, Avenevoli, & Merikangas, 2001) and out of these one of the most serious outcomes is DSH (O'Connor, Rasmussen, & Hawton, 2009). The high prevalence rate of depression and anxiety in Pakistan and their predictive role for DSH (Cook, Heinze, Miller, & Zimmerman, 2016) makes it valuable to look into the evidence for the link between depression, anxiety and DSH.

DEPRESSION AND ANXIETY AS PREDICTORS OF DSH

Many community studies on school based sample in Western countries identified depression and anxiety as predictors of DSH. For example, in a study on 8 secondary schools in the Midlands and South West of England ($N=3964$, 12-16 years age), low mood along with avoidant peer attachment in boys and anxious peer attachment in girls were

found to be associated with increase in DSH (Stallard, Spears, Montgomery, Phillips & Sayal, 2013). This study compared the development of DSH and its predictors at two time points and used a single item to measure DSH. Despite the use of single item, the rate of DSH was higher than other community based studies and the study was able to successfully capture factors associated with development of DSH. However, it did not include other elements of DSH (such as planning). Thus, it was only able to isolate the predictors for actual act of DSH and not the association of severity of predictors with severity of DSH. Furthermore, the study employed multivariate analyses method but did not include any effect of interaction between the predictors (depression and attachment).

There are many other studies on school going adolescents which present evidence for association of depression and anxiety with DSH (e.g., Kidger, Heron, Lewis, Evans & Gunnell, 2012; Brunner, Parzer, Haffner, Steen, Roos, Klett and Resch, 2007; Hawton, Rodham, Evans, & Weatherall, 2002; McMahon, Reulbach, Corcoran, Keeley, Perry, & Arensman, 2010). Literature review also indicates that anxiety and depression are differentially associated with DSH. For instance, McMahon, Reulbach, Corcoran, Keeley, Perry and Arensman, (2010) concluded that as compared to depression, anxiety was more strongly associated with DSH in boys (52% girls; 15-17 years age). Another similar school based survey in Scotland on 2008 pupils aged 15–16 years (13 schools, almost 53% girls) concluded that depression was insignificantly and anxiety was significantly associated with DSH in both genders. (O'Connor, Rasmussen, Miles & Hawton, 2009). Like Stallard and colleagues (2013) all these studies, suffer from a limitation of not being able to consider the severity of DSH in relation to severity of depression and anxiety; did not

study interactional effects of predictors; and utilized small and varying age groups of adolescents. Catering these limitations will allow better understanding of the relationship between depression, anxiety and DSH within developmental context. However, from the review of the mentioned studies, it can be seen that deliberate self-harmers experience elevated levels of negative emotions in the form of depression and/ or anxiety symptoms.

Fliege, Lee, Grimm and Klapp, (2009) suggested that DSH is done in order to alleviate the heightened state of negative emotions. A recent study using card sort method ascertained this suggestion of the link between experiencing heightened state of negative emotions and DSH. Townsend et al. (2016) developed and administered the Card Sort Task for Self-harm (CaTS) with 41 individuals (13-21 years old) to explore the thoughts, feelings, events and behaviors related to DSH. The cards were developed based on theories of DSH (e.g., cry of pain model, Joiner's interpersonal theory and other related theories). Townsend and colleagues (2016) concluded that feeling sad ($N=38$), restless and agitated ($N=23$) before DSH, and feeling relieved afterwards ($N=23$) were among the most frequently reported experiences. The more we explore the literature, more convinced we become about the significant role of depression and anxiety in DSH. However, what the literature is not able to address well is whether this link of depression and anxiety serves as a source for generating DSH or a bridging link of DSH with other factors. This is where the theory of attachment becomes worth considering. Role of heightened state of negative emotions in the form of depression and anxiety symptoms can be understood as an explanatory link between attachment and DSH. This mediating role of depression and anxiety is discussed in the next section.

MEDIATING ROLE OF DEPRESSION AND ANXIETY IN ASSOCIATION OF ATTACHMENT WITH DSH

Attachment theory postulates that individuals with problematic attachment will be inclined to experience more negative emotions in the event of stress (Bifulco & Thomas, 2013). Combined with the literature review presented in chapter 1, this suggests that attachment is not only associated with DSH but with depression and anxiety as well; and depression and anxiety are associated with DSH (as elucidated in preceding section). There is also empirical evidence which suggests that different attachment styles are significantly associated with depression and anxiety (Marganska, Gallagher, & Miranda, 2013). For instance, regression analysis of data obtained from 652 Turkish University students indicated that out of the four attachment styles those with negative view of self (preoccupied and fearful) were more vulnerable to depression (Erozkan, 2011). Another recent study by Cook, Heinze, Miller and Zimmerman (2016) outlined the pivotal importance of insecure attachment during adolescence ($N=541$, age 16 years) in relation to later development of depression at 18 years of age, through growth curve model. Similarly, Rosenthal, Somers, Flemming and Walsh, (2014) also reported that more negative self and other model of attachment resulted in higher depressive symptoms ($N=105$, model age range 20-30 years). With respect to anxiety evidence of relationship of attachment can be obtained from the studies conducted by Marganska, Gallagher and Miranda (2013), Jakobsen, Horwood and Fergusson (2012), and Bekker and Croon, (2010). From the review of these studies the association of attachment with depression and anxiety seems evident.

Apart from the evidence supporting indiscriminate association of both models of attachment with depression there is also some evidence which suggests that models of attachment are differentially associated to depression and indiscriminately associated to anxiety. For example, in a sample of 662 Chinese University students (18- 23 years age) anxious attachment (negative self model) was associated with depression and both anxious and avoidant attachment (i.e. negative self and other models) were associated with anxiety (Jinyao et al., 2012). Bekker and Croon (2010) reported that only anxious attachment was associated with both anxiety and depression. Avoidant attachment had weak indirect influence on anxiety through capacity for managing new situations (Bekker & Croon, 2010). It seems attachment is a general vulnerability factor that influences depression and anxiety but it's self and other models may differ in the strength of influence that it exerts on depression and anxiety. Considering the variation in evidence for association of models of attachment with depression and anxiety, in the present study both models of attachment will be hypothesized to be associated with depression and anxiety.

Now the important consideration of the interactive role of depression, anxiety and attachment with respect to DSH will be addressed. There is a long-standing debate in the existing literature that whether attachment and stress influence psychopathology independently (main effect model) or whether it is the interaction between attachment and stress (depression and anxiety symptoms for the present study) that leads to psychopathology (vulnerability model). Various studies have pointed out the possible mediating and/ or moderating role of depression and anxiety. For instance, Hallab and Covic (2010) explored the relationship between attachment, depression and DSH. In this

study a sample of 114 deliberate self-harmers was extracted from non-clinical population (head-banging= 47%, hitting= 46%, scratching= 38% and cutting= 34%). Results showed that those who engaged in DSH had lower quality of attachment to parents but not to friends. They also experienced more stress, anxiety and depressive symptoms. Stress mediated the association between attachment and DSH in path analysis (Hallab & Covic, 2010). The study supports vulnerability argument but does not provide direct evidence for interaction of depression, anxiety and attachment. Another study concluded that the relationship between attachment anxiety and self-directed aggression (both suicidal and non-suicidal) is mediated by depression among psychiatric inpatients (Gormley & McNiel, 2010). Thus, it can be seen that there is circumstantial evidence available for hypothesizing that association of attachment is mediated through other factors. This also asserts that attachment is a general vulnerability factor and the exact developmental pathway of DSH can be determined through studying interaction between attachment and other predictors of DSH.

From the studies reviewed in this section, it seems a malfunctioning in either personal (self), interpersonal (other) or both domains of attachment influences depression and anxiety. The association of self model (i.e., cognition about self) with depression and anxiety is easily conceivable as attachment models are cognitive representations, they are likely to influence cognitive and affective states of individuals (Bifulco & Thomas, 2013). On the other hand, problematic other model influencing depression present an interesting scenario as it involves relationship factors. Teo, Choi and Valenstein (2013) suggested that poor relationship quality with family increased risk of depression in adults ($N=4642$,

25-75 year age). This poor quality of relationship contributes towards the development of negative other model, which in turn feeds back into maintaining the poor quality of relationship (Berlin, Cassidy, & Appleyard, 2008). With respect to quality of relationship two factors are worth considering 1) one's perception of support available to them from others i.e., perceived social support and 2) interpersonal relationship skills. Literature indicates that both of these factors take direct feedback from models of attachment (Cassidy & Shaver, 2008). For instance, according to Erozkhan (2011) and, Agerup, Lydersen, Wallander and Sund (2015) in case of problems with other model an individual is less likely to trust others and seek support which can lead to feelings of loneliness and depression. Such a postulation suggests that there might be more than one mediating factor in association of attachment with DSH that is along with depression and anxiety the role of social support and interpersonal problems should be considered. This hypothesis is also in line with the nature of attachment concept consisting of self and other model where other model suggests the role of interpersonal factors. Therefore, the next section will discuss the possibility of exploring the role of social support in the model of association of attachment, depression, anxiety and DSH. Role of interpersonal problems will be addressed in the chapter 6.

SOCIAL SUPPORT AND DSH

Social support is one of the most researched predictors of mental health. Social support derived from family, peers and teachers is considered as a main resource for coping with numerous changes and new situations occurring during adolescence

(Hombrados-Mendieta, Gomez-Jacinto, Dominguez-Fuentes, Garcia-Leiva, & Castro-Trave, 2012; Malecki & Demaray, 2003). It is a multidimensional concept, which accommodates both structural (number of relationships) and functional (usefulness of the existing relationships) aspects (Cohen & Wills, 1985). Another interesting fact pointed out in research on social support, is the distinction drawn between actual social support and perceived social support (Cohen & Wills, 1985). Research has argued that perceived social support is a better predictor than actual social support for mental health outcomes (Goodwin, Cost, & Adonu, 2004). Thus, just having a belief in availability of social support may have positive implications for adolescent development irrespective of the actual availability of social support. According to Cohen and Wills (1985) social support acts through reducing the perceived effect of stress leading to negative outcomes (Cohen & Wills, 1985). Cohen and Wills (1985) postulation can be supported by Kerr, Preuss and King's (2006) study conducted on 220 suicidal adolescents (152 females), in a psychiatric hospital. It was concluded that social support from family buffered against hopelessness and suicidal ideation (Kerr, Preuss, & King, 2006). Another longitudinal study also asserted that social support buffers against DSH among adolescents and youth (both the actual act of DSH and the ideation) (Connor & Rueter, 2006).

There is also evidence that reduction in social support can put an individual at an increased risk of DSH. In a longitudinal study of 23 (21 females) first year undergraduate college students, individuals involved in non-suicidal DSH reported less social support from peers than those not involved in DSH (Heath, Ross, Toste, Charlebois, & Nedecheva, 2009). Adolescence is an important time period where relationships expand from parents

to peers. Consequently, a decrease in peer social support may play an influential role in DSH, compelling these lonely individuals to choose to express themselves in a more extreme manner (Nock, 2008). Thus, it is well established in the literature that social support is an important predictor of DSH that leads to the question of its relative standing with other predictors of DSH including attachment, depression and anxiety. This will be addressed in the following sections on conceptualization of social support within attachment framework and interaction of social support with depression and anxiety.

SOCIAL SUPPORT CONCEPTUALIZED WITHIN ATTACHMENT FRAMEWORK

According to attachment theory, internal working models develop during repeated daily transactions between a child and care giver/s through activation of attachment behavioral system and exploration of the environment. These internal working models continue to evolve with development and ongoing experiences. They facilitate development by providing opportunities for exploring social environment (Cassidy & Shaver, 2008; Bifulco & Thomas, 2013). As stated in the earlier section, there are two major interpersonal influences that can be seen here as a consequence of specific attachment experiences; (1) an expectation about others' behaviors and support (i.e., social support) and (2) an opportunity to develop a pattern of interaction and practice interpersonal skills (explained in next chapter) (Berlin, Cassidy, & Appleyard, 2008). With respect to social support an individual's internal representations (Bowlby, 1988) are proposed to have the potential to guide future experience of relationships. These internal

representations or working models of attachment influence the perception of other people in a person's social world and thus, form the basis for understanding others (Bowlby, 1988). When the internalized aspect of others is projected onto others' expected and actual behavior, it shapes into the concept of perceived social support. If a child has an internal working model of others as aggressive this will regulate their anticipation of others. This postulate is empirically shown in Tresno and Mearns study (2016) which concluded that childhood maltreatment results in decreased perceived social support. On the other hand, if a child has a more supportive and less intimidating view of others it will lead to development of an expectation of others being more supportive and less belligerent (Champion, 1995). A study on 308 undergraduate Malaysian students concluded that secure attachment styles had significant positive relationship with social support and "preoccupied with mistrust style" was significantly negatively associated with decreased perceived social support (Khodarahimi, Hashim, & Mohd-Zaharim, 2016). Most studies on attachment and expectations of social support incorporate this prediction that secure individuals are more likely to evaluate others' receptiveness positively and vice versa (Mikulincer & Shaver, 2009). Thus, it can be seen that before playing a buffering role for DSH, the concept of social support takes direct feed from internal working models of attachment and thus, it must be considered within attachment framework as mediating factor along with depression and anxiety.

INTERACTION OF SOCIAL SUPPORT WITH DEPRESSION AND ANXIETY

Social support from family, friends and teachers acts as a psychological barrier against many mental health problems (Cohen & Wills, 1985). In addition to social support acting as a direct buffer against DSH, it may also buffer through moderating or mediating effects on other risk factors related to DSH (Harrison, Dombrovski, Morse, Houck, Schlernitzauer, Reynolds III & Szanto, 2010). Kleiman, Riskind, Schaefer and Weingarden (2012) found that among 169 undergraduates, those who were more at risk for suicidal DSH because of being impulsive were protected against it if they had high levels of social support. In this study a moderating role of social support was demonstrated. More recent evidence also asserts the importance of social support as moderator (Farrell, Bolland, & Cockerham, 2015). There is also evidence that social support can act as mediator between mood states and DSH. For example, social support buffered from DSH by protecting against depression among 314 University students (243 females) (Chioqueta & Stiles, 2007). Taken together, the presented evidence suggests that social support not only buffers against DSH and intervenes to reduce its risk factors, it is influenced by developmental factors and buffers against depression and anxiety as well. However, there is hardly any empirical study to verify this mediating role of social support in association of attachment with depression, anxiety and DSH.

THE PRESENT STUDY: EVIDENCE FOR HYPOTHESIZING INTERACTION OF ATTACHMENT, SOCIAL SUPPORT, DEPRESSION AND ANXIETY LEADING TO DSH

Research on developmental pathways from attachment to DSH is scarce but the indirect evidence collected from various studies and reviewed in this chapter suggests that there is a complex web of relationships between attachment, depression, anxiety and social support as predictors of DSH. It seems that attachment influence DSH as well as its predictors; depression, anxiety and social support which also interact with each other in mediating or moderating fashion. However, there is scarcity of evidence for incorporating these variable into a single model. The hint for hypothesizing the link between these predictors and DSH in a single model can be obtained from Tresno and Mearns (2016), and Vogel and Wei's (2005) studies. Tresno and Mearns (2016) indicated that social support and mood regulation double mediates the relationship of childhood maltreatment with non-suicidal DSH. Similarly, Vogel and Wei (2005) supported the double mediating role of social support and psychological distress in association of attachment with help seeking. From the results of these two studies, it seems that all these predictors considered in this study are not just simply linked with each other, they are acting through double mediation pathway. Therefore, in the present thesis it is hypothesized that attachment influence DSH and its predictors. The association of attachment with DSH is partially double mediated through social support, depression and anxiety; and depression and anxiety are acting as moderators for each other.

CONTEXTUALIZING THE RELATIONSHIP OF ATTACHMENT, SOCIAL SUPPORT, DEPRESSION, ANXIETY AND DSH

Attachment theory has been accused of not being able to account for contextual differences in its formulation of attachment styles and models. When these formulations are applied to various cultural set ups especially those with no/ little Western influence and dominance of indigenous values (e.g., Japanese culture), they need to be revised (Behrens, 2016). However, the required revisions are based on the originally proposed theory of attachment which strengthens the fundamental role of attachment. In order to understand the applicability of the attachment theory in a particular context one approach can be to consider contextual factors. The importance of including contextual factors is stressed in attachment theory itself. An example of contextual consideration can be deduced from the negative life events serving to activate attachment system (Bifulo & Thomas, 2013). Similarly, evolution of attachment with age is another example of consideration of broad contextual factors in attachment theory (Cassidy & Shaver, 2008). Gender and socioeconomic status are also two important demographic factors which have been found to influence DSH (Farrell, Bolland, & Cockerham, 2015; Hawton, Bergen, Kapur, Cooper, Steeg, Ness, & Waters, 2012; Welch, 2001; O'Connor, Rasmussen, & Hawton, 2010; Young, van Beinum, Sweeting, & West, 2007) (see chapter 1 for details of empirical evidence).

Thus, there is need to include contextual factors like; age, gender, socioeconomic class and negative life events. These broader contextual influences are especially

significant in the context of a developmental approach. They will not only help to isolate the contextual conditions under which individual risk factors are related to DSH but inclusion of these into the model for predictive pathways of DSH will help to understand the applicability of the model within specific social contexts and universality across various social setups. Therefore, these contextual variables can act as important factors for determining interaction between different predictors of DSH.

Apart from contextual factors' association with DSH, they are also known to be associated with depression and anxiety. For instance, it is well known that rates of depression and anxiety vary among males and females (WHO, 2016b). Similarly with respect to age, studies report that wellbeing increase with increasing age among adolescents (Steptoe, Deaton, & Stone, 2015). There is also evidence that adolescents have relatively low wellbeing as compared to adults (Chen & Page, 2016; Springer, Pudrovska, & Hauser, 2011). Adolescents have also been reported to have high rates of depression and anxiety (Khalid, 2015). However, studies analyzing the change in depressive and anxiety symptoms with age within adolescents are scarce. Therefore, considering the evidence available for the link of age and gender with depression and anxiety, it will be useful to hypothesize that gender and age are associated with DSH as well as depression and anxiety. Apart from age and gender, socioeconomic status and negative life events have been also been associated with depression and anxiety (Friis, Wittchen, Pfister, & Lieb, 2002; Green & Benzeval, 2013). Hence, in the present study where model of attachment and DSH with mediators (social support leading to depression and anxiety) is

tested separately to isolate their interrelationship, the model is also tested for moderated and mediated effects of age, gender, socioeconomic status and negative life events.

OBJECTIVES

There are two aims of the data analyses conducted and presented in this chapter.

1. To understand the interaction of attachment, social support, depression and anxiety with DSH using Structural Equation Modelling.
2. To explore the hypothesized relationship of attachment, social support, depression and anxiety with DSH within the context of gender, age, family affluence and negative life events.

HYPOTHESES

Following hypotheses were formulated in this chapter for testing two SEM models

1. Model 1

Association of self and other model of attachment with DSH is double mediated by social support leading to depression and anxiety to predict DSH. This double mediation will be tested for partial and complete effects as attachment is hypothesized to influence not only social support directly but depression, anxiety and DSH as well. Similarly, mediation of depression and anxiety in the association of social support with DSH will be tested for partial and complete effects.

Following is an elaborated picture of the hypothesized pathways.

Direct pathways

Following are the hypothesized direct pathways in Model 1

1a. Adolescents with negative view of self and others will report more DSH

1b Adolescents with decreased perceived social support will report more DSH.

1c 1b Adolescents with higher scores on depression and anxiety will report more DSH.

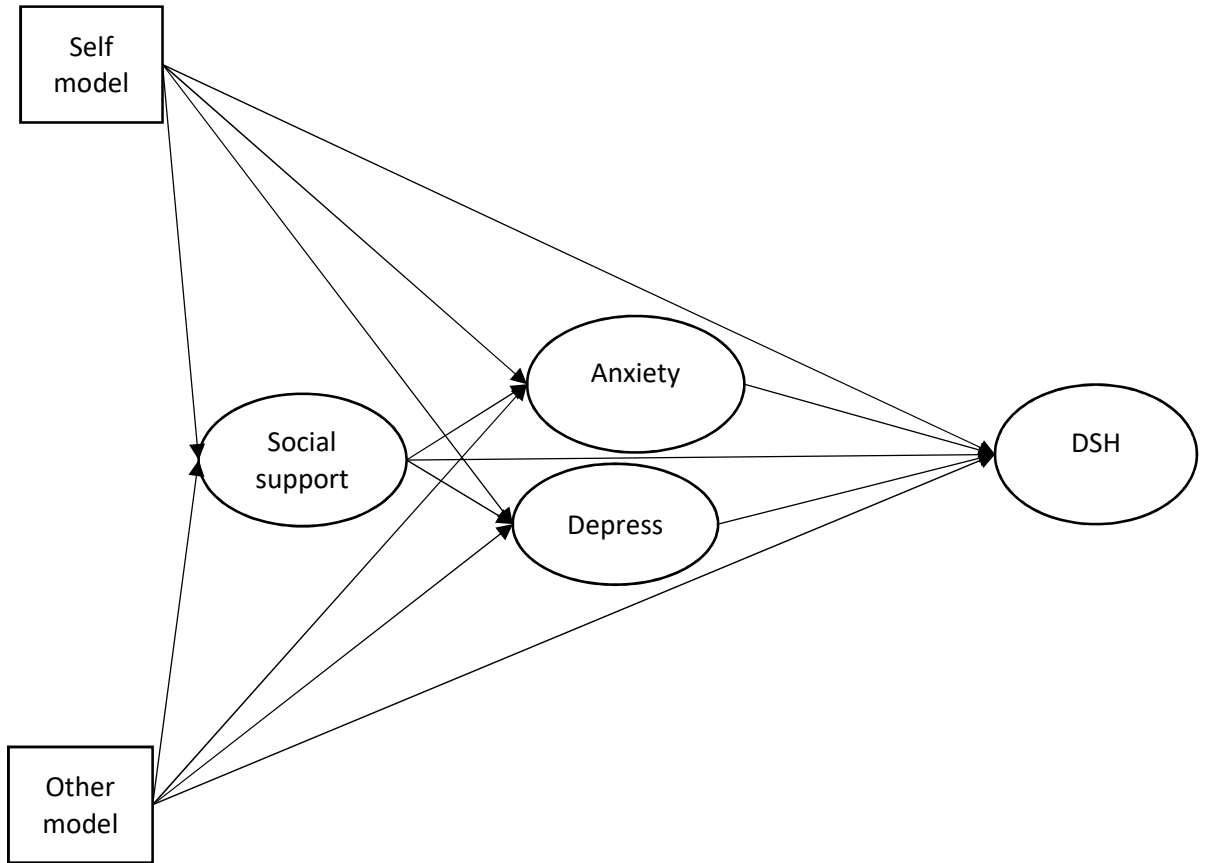
Mediation pathway

1b. Adolescents with negative view of self and others will perceive lower social support which will lead to high depression and anxiety, and both depression and anxiety will then lead to increased DSH.

Following is the diagrammatic presentation of the hypothesized direct and indirect pathways.

Figure 5. 1

Diagrammatic presentation of hypothesized pathways for association of attachment, social support, depression and anxiety with DSH.



2. Model 2

Age, gender, socioeconomic status and negative life events act as moderators for predicting DSH. They also influence DSH through depression and anxiety. Both direct and indirect pathways are hypothesized and will be tested for partial and complete effects. Following are the specific hypotheses formulated for this model.

Direct pathways

2a. Increase in age, female gender, lower family affluence and increase in negative life events will lead to increase in DSH.

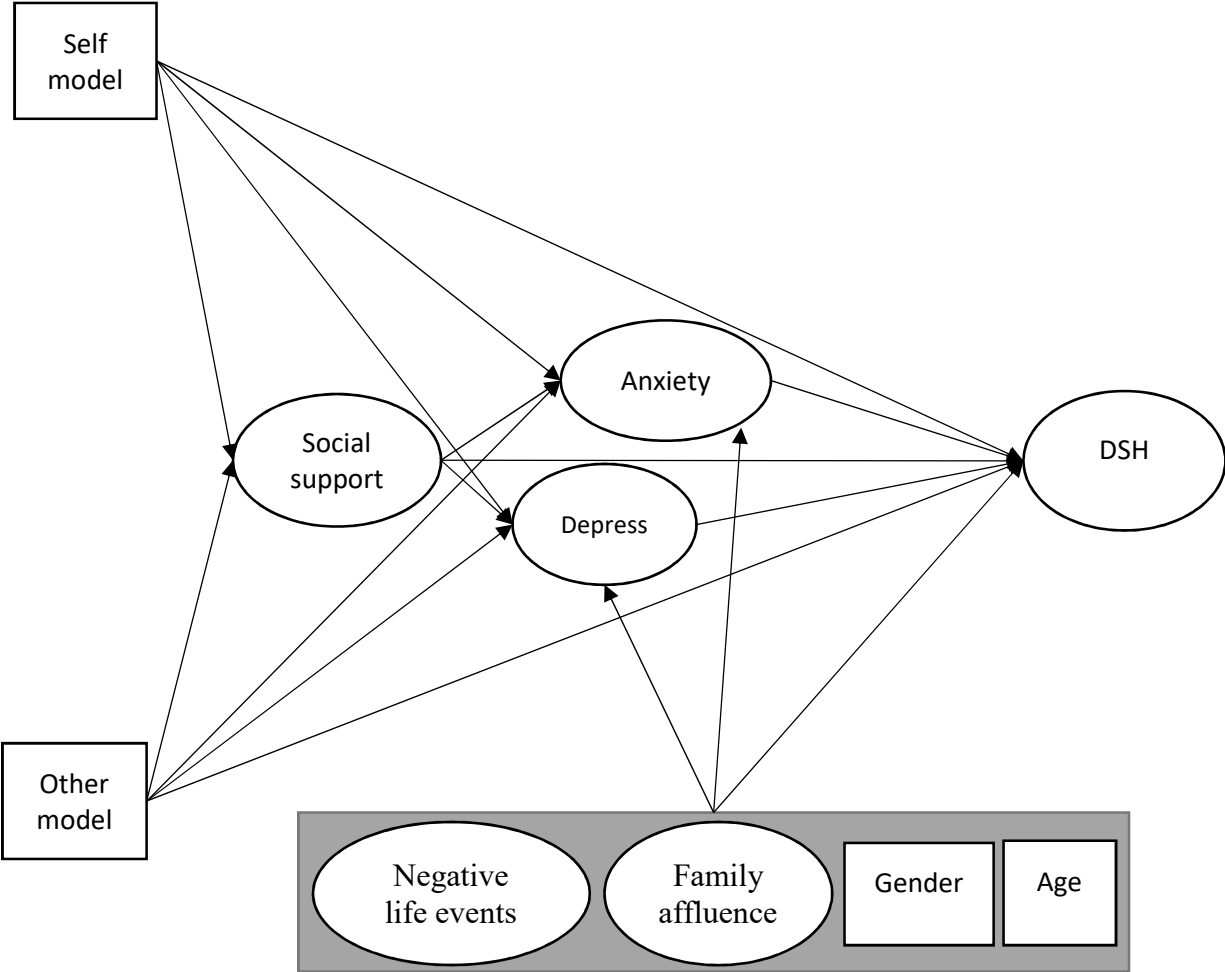
Indirect pathways

2b. Increase in age, female gender, lower family affluence and increase in negative life events will lead to higher scores on depression and anxiety which will in turn predict increased DSH.

These hypotheses are diagrammatically presented in the following figure.

Figure 5. 2

Diagrammatic presentation of hypothesized pathways for association of attachment, social support, depression and anxiety, with DSH while controlling for age, gender, family affluence and negative life events.



METHOD

Data was collected from 1420 Pakistani school going adolescents. Translated versions of self-report psychological instruments were administered in group setting on 10-19 years old adolescents. In this study following instruments were used:

1. Self and other models of attachment were measured using Adolescent Relationship Scales Questionnaire (Scharfe, 1996).
2. DSH was measured with items from Youth Health Risk Behaviour Survey (2011 version) developed by Centre for Disease Control and Prevention (CDC).
3. Significant Others Scale (Power, Champion, & Aris, 1988) was used for perceived social support
4. Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) was used for measuring depressive and anxiety symptoms.
5. Information about age and gender was obtained in demographic pro forma along with other demographic variables.
6. Family affluence scale-II (FAS-II) (Boyce, Torsheim, Currie, & Zambon, 2006) was used to enquire about socioeconomic status.
7. Negative life events were measured through negative life event items obtained from Child and Adolescent Self-harm in Europe survey (O'Connor, Rasmussen, & Hawton, 2009).

After data collection 128 cases were excluded as they had more than 50% missing data. Multiple imputation (MI) was performed in SPSS 20. After MI, 1290 cases were available for testing the hypothesized pathways through structural equation modelling (SEM). The univariate analyses of data is presented in descriptive results chapter. For structural equation modelling both structural (i.e., factor analyses) and measurement models were built. The structural model is presented in chapter on translation and adaptation of scales whereas results of the measurement model concerning the hypothesized relationships are presented in this chapter. Bivariate associations of the hypothesized pathways are also presented here.

RESULTS

In this section results of bivariate associations of the hypothesized pathways are presented. This is followed by SEM model of attachment, social support, depression, anxiety and DSH. Results of the same model tested while controlling for contextual factors are also presented.

BIVARIATE ASSOCIATIONS

The bivariate associations of all subscales of social support, self and other models of attachment, DSH, depression and anxiety are presented in the following table. Discrepancies in emotional, practical and total social support were significantly associated with DSH. DSH was also significantly associated with depression, anxiety and self model of attachment. Actual practical and discrepancies in emotional, practical and total social

support were associated with self model of attachment. With other model of attachment both ideal and actual types of emotional, practical and total social support were significantly associated. All subscales of social support were also significantly associated with depression and anxiety except for association of discrepancy in practical social support and depression.

Table 5. 1

Pooled results for associations of age, family affluence (FA), negative life events (LES), DSH, depression (dep), anxiety (anx) and social support (N=1290).

| | DSH | Self | Other | Dep | Anx | AE | IE | AP | IP | AS | IS | DE | DP | DS |
|--------------|-----|-------|-------|---------|---------|---------|---------|---------|--------|---------|---------|---------|---------|---------|
| DSH | - | 0.06* | 0.01 | 0.12** | 0.19** | -0.06 | -0.02 | -0.05 | -0.03 | 0.05 | -0.02 | 0.11** | 0.1** | 0.12** |
| Self | - | - | 0.1* | -0.92** | -0.28** | 0.02 | 0.03 | 0.07* | 0.04 | 0.04 | 0.03 | -0.08** | -0.08** | -0.1** |
| Other | - | - | - | -0.02 | -0.9** | -0.13** | -0.13** | -0.06* | -0.06* | -0.1** | -0.1** | 0.00 | 0.03 | 0.02 |
| Dep | - | - | - | - | 0.22** | -0.18** | -0.2** | -0.18** | 0.16** | -0.19** | -0.19** | 0.08** | 0.05 | 0.08** |
| Anx | - | - | - | - | - | -0.06* | -0.08** | -0.07* | -0.07* | -0.08** | -0.08** | 0.13** | 0.14** | 0.16** |
| AE | - | - | - | - | - | - | 0.82** | 0.7** | 0.69** | 0.93** | 0.8** | -0.4** | -0.41** | -0.48** |
| IE | - | - | - | - | - | - | - | 0.7** | 0.76** | 0.83** | 0.95** | -0.19** | -0.23** | -0.26** |
| AP | - | - | - | - | - | - | - | - | 0.8** | 0.92** | 0.81** | -0.34** | -0.42** | -0.44** |
| IP | - | - | - | - | - | - | - | - | - | 0.79** | 0.92 | -0.14** | -0.19** | -0.19** |
| AS | - | - | - | - | - | - | - | - | - | - | 0.86** | -0.41** | -0.46** | -0.5** |
| IS | - | - | - | - | - | - | - | - | - | - | - | -0.18** | -0.23** | -0.24** |
| DE | - | - | - | - | - | - | - | - | - | - | - | - | 0.48** | 0.85** |
| DP | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.84** |
| DS | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Note: ** = $p < 0.01$; * $p < 0.05$; Self= self model; Other= other model; DSH= deliberate self-harm; dep= depression; anx= anxiety; AE: Actual emotional support; IE= Ideal emotional social support; AP: Actual practical support; IP= Ideal practical social support; AS: Actual total support; IS= Ideal total social support; DE: Discrepancy in emotional support; DP= Discrepancy in practical social support; DS= Discrepancy in total social support

The bivariate associations of age, gender, family affluence and negative life events with DSH, depression, anxiety and interpersonal relationship problems are presented in the following tables.

Table 5. 2

Pooled results for associations of age, family affluence (FA), negative life events (LES), DSH, depression (dep), anxiety (anx) and social support (N=1290).

| | Age | FA | LES | DSH | Dep | Anx | AE | IE | AP | IP | AS | IS | DE | DP | DS |
|------------|-----|--------|--------|--------|--------|-------|---------|---------|---------|--------|---------|---------|---------|---------|---------|
| Age | - | 0.12** | 0.06* | 0.1** | -0.00 | -0.04 | 0.04 | 0.05 | -0.02 | 0.01 | 0.01 | 0.03 | -0.01 | 0.01 | 0.00 |
| FA | - | - | 0.11** | 0.11** | -0.1** | -0.05 | 0.04 | 0.02 | 0.09** | 0.05 | -0.06* | 0.00 | -0.07* | -0.06* | -0.08** |
| LES | - | - | - | 0.23** | 0.07** | 0.3** | 0.03 | -0.07* | -0.02 | 0.00 | 0.00 | -0.02 | 0.09** | 0.1** | 0.12** |
| DSH | - | - | - | - | 0.12* | 0.19* | -0.06 | -0.02 | -0.05 | -0.03 | 0.05 | -0.02 | 0.11** | 0.1** | 0.12** |
| Dep | - | - | - | - | - | 0.22* | -0.18** | -0.2** | -0.18** | 0.16** | -0.19** | -0.19** | 0.08** | 0.05 | 0.08** |
| Anx | - | - | - | - | - | - | -0.06* | -0.08** | -0.07* | -0.07* | -0.08** | -0.08** | 0.13** | 0.14** | 0.16** |
| AE | - | - | - | - | - | - | - | 0.82** | 0.7** | 0.69** | 0.93** | 0.8** | -0.4** | -0.41** | -0.48** |
| IE | - | - | - | - | - | - | - | - | 0.7** | 0.76** | 0.83** | 0.95** | -0.19** | -0.23** | -0.26** |
| AP | - | - | - | - | - | - | - | - | - | 0.8** | 0.92** | 0.81** | -0.34** | -0.42** | -0.44** |
| IP | - | - | - | - | - | - | - | - | - | - | 0.79** | 0.92 | -0.14** | -0.19** | -0.19** |
| AS | - | - | - | - | - | - | - | - | - | - | - | 0.86** | -0.41** | -0.46** | -0.5** |
| IS | - | - | - | - | - | - | - | - | - | - | - | - | -0.18** | -0.23** | -0.24** |
| DE | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.48** | 0.85** |
| DP | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.84** |
| DS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Note: ** = $p < 0.01$; * $p < 0.05$; FA= family affluence; LES= negative life events; DSH= deliberate self-harm; dep= depression; anx= anxiety; AE: Actual emotional support; IE= Ideal emotional social support; AP: Actual practical support; IP= Ideal practical social support; AS: Actual total support; IS= Ideal total social support; DE: Discrepancy in emotional support; DP= Discrepancy in practical social support; DS= Discrepancy in total social support

Table 5. 3

Pooled mean ranks for association of gender with DSH, depression, anxiety and social support (N=1290).

| | Gender | |
|---|-------------------------|---------------------------|
| | Male (n=707) | Female (n=583) |
| DSH | 640.65 | 651.38 |
| Depression | 656.04 | 651.38 |
| Anxiety | 603.45 | 696.49 |
| Actual emotional support | 646.62 | 643.97 |
| Ideal emotional support | 646.76 | 643.97 |
| Actual practical support | 642.56 | 649.06 |
| Ideal practical support | 645.01 | 646.09 |
| Actual total support | 643.8 | 647.56 |
| Ideal total support | 646.36 | 644.46 |
| Discrepancy in emotional support | 640.48 | 651.59 |
| Discrepancy in practical support | 635.73 | 657.34 |
| Discrepancy in total support | 634.99 | 658.24 |

For all imputed data sets, the difference in mean ranks of males and females was not significant for DSH, working models of attachment, depression, anxiety and social support.

STRUCTURAL EQUATION MODELS

MODEL 1: ATTACHMENT AND DSH: ROLE OF SOCIAL SUPPORT, DEPRESSION AND ANXIETY

Based on the theoretical assumptions and the empirical evidence discussed in literature review presented in this chapter and chapter 1, it was hypothesized that self and other models of attachment will predict DSH, depression, anxiety and social support. It was also hypothesized that social support, depression and anxiety will predict DSH directly. Social support will also predict DSH through depression and anxiety. Thus, a partial double mediational pathway is hypothesized here starting from attachment models through social support leading to bifurcated pathways to depression and anxiety to predict DSH.

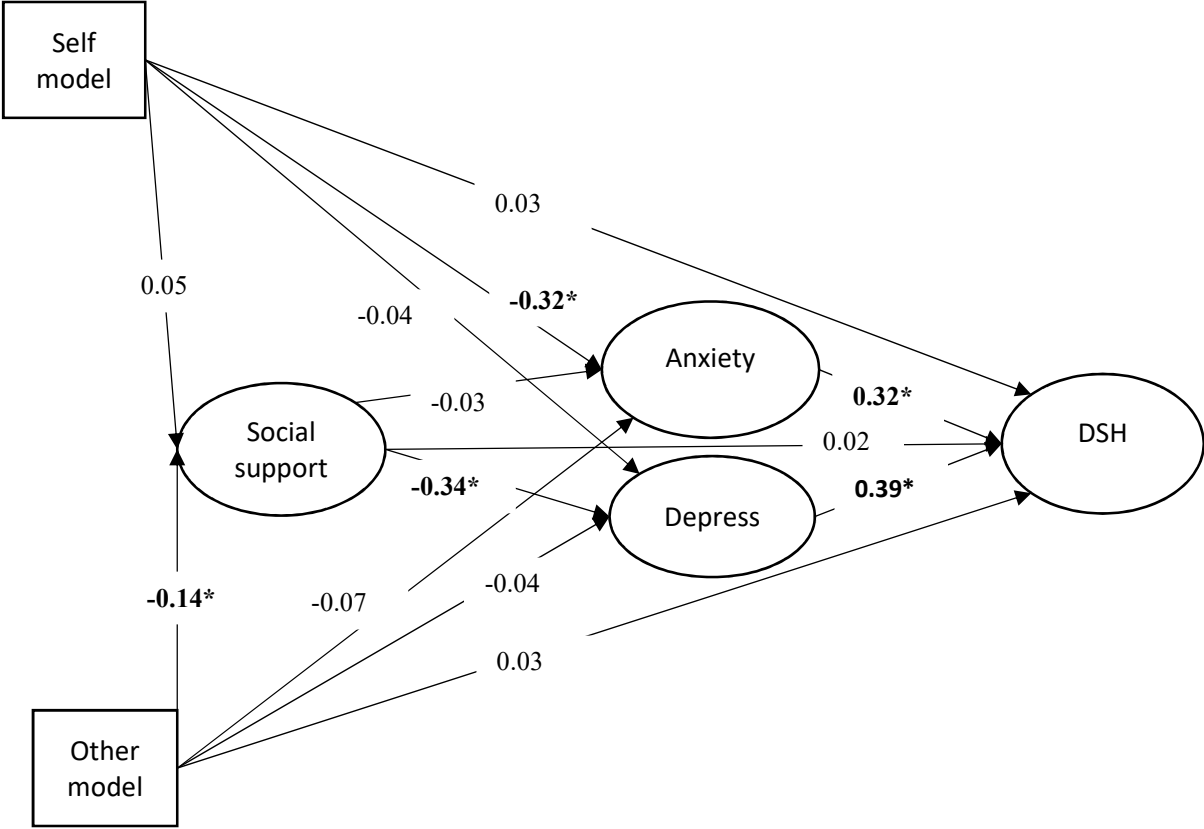
Hypothesized model

Based on hypothesized pathways this model was subjected to a priori structural equation modelling. A total of two observed variables (self and other models of attachment) and three latent variables (depression, anxiety and social support) were used to predict one latent outcome (DSH) with 89 free parameters.

The initial model had good fit (mean $\chi^2 = 629.29$, $df = 260$; mean $CFI = 0.91$; mean $RMSEA = 0.03$) but there were many insignificant pathways as shown in the following figure.

Figure 5. 3

Diagrammatic presentation of initial SEM model for association of attachment, social support, depression and anxiety with DSH (N=1290).



Note: * = $p < 0.05$

Changes made in the model

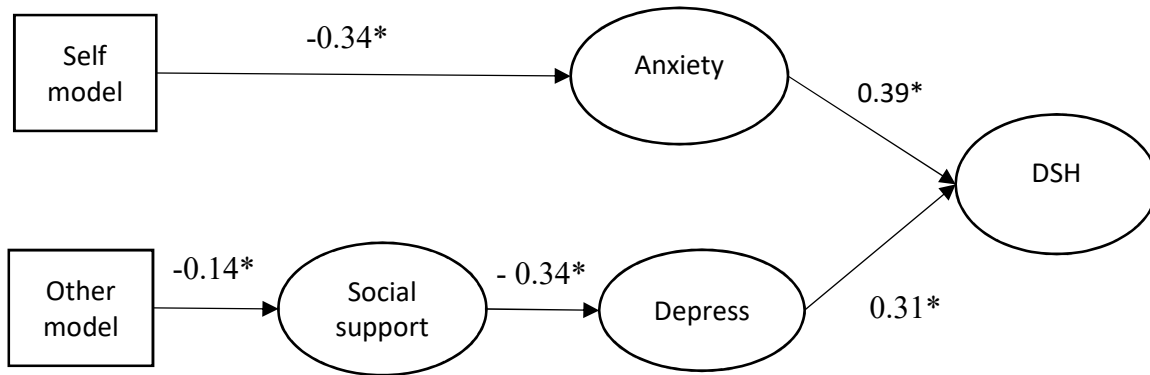
Changes were made in the model with respect to removing one hypothesized insignificant relationship at a time. As a first step for model modification only direct pathways were examined. It could be seen from the significance value of the pathways that attachment did not significantly influence the outcome variable directly. It also did not influence all predictors in a similar way. Therefore, insignificant pathways leading from attachment to outcome variable and mediating variables were deleted. Similarly, insignificant pathways from social support leading to DSH and anxiety were removed. As a result of these changes a model with only significant pathways emerged. Details of the significant pathways are presented in the following section.

Final model

The final model had four latent predictors, seven observed predictors, four outcome variables and 81 free parameters. The model fit is good with 591.33 mean χ^2 ($df = 268$), 0.03 mean *RMSEA* and 0.93 mean *CFI*. For the purpose of clear presentation of the significant pathways obtained, following figure presents only structural part of SEM.

Figure 5. 4

Diagrammatic presentation of significant pathways in final SEM model for association of attachment, social support, depression and anxiety with DSH (N=1290).



Note: * = $p < 0.05$

Two pathways emerged in the final model one originating from self model and other from other model of attachment. In the first pathway association of self model of attachment with DSH was completely mediated by anxiety. With decrease in positive score on self model anxiety increased (-0.34, $p = 0.000$) which in turn increased DSH (0.39, $p = 0.000$). In the second pathway association of other model was completely double mediated by social support and depression; as hypothesized. Decrease in positive score on other model (-0.14, $p = 0.000$) led to decrease in perceived social support which then resulted in increased depression (-0.34, $p = 0.000$) finally leading to increased DSH (0.31, $p = 0.000$).

MODEL 2: CONTEXTUALIZING THE RELATIONSHIP OF ATTACHMENT, SOCIAL SUPPORT, DEPRESSION, ANXIETY AND DSH THROUGH CONTROLLING FOR AGE, GENDER, FAMILY AFFLUENCE AND NEGATIVE LIFE EVENTS.

As the literature review indicated that there is need to contextualize the hypothesized relationships of attachment, social support, depression, anxiety and DSH, it was hypothesized that age, gender, family affluence and negative life events will moderate the association of DSH with its predictors. It was also hypothesized that these contextual variables will influence depression and anxiety. Thus, indirect pathways were also drawn from age, gender, family affluence and negative life events to DSH through depression and anxiety.

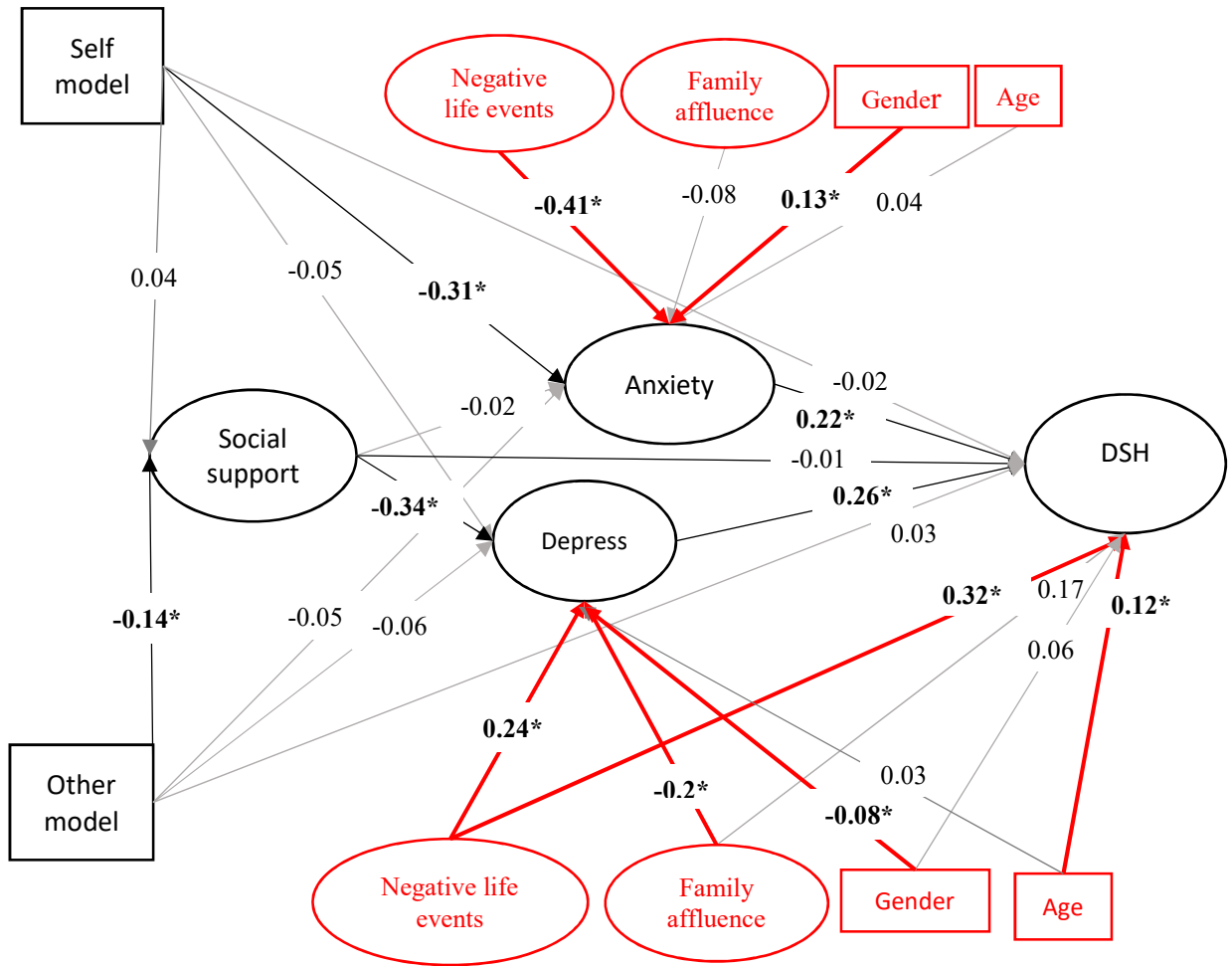
Hypothesized model

Based on hypothesized pathways this model was subjected to a priori structural equation modelling. A total of four observed variables (self model, other model, age and gender) and five latent variables (depression, anxiety, social support, family affluence and negative life events) were used to predict one latent outcome (DSH) with 167 free parameters.

The initial model shown in the following figure had poor fit (mean $\chi^2 = 1585.44$, $df = 1048$; mean $CFI = 0.81$; mean $RMSEA = 0.02$).

Figure 5. 5

Diagrammatic presentation of initial SEM model for association of attachment, social support, depression and anxiety, with DSH while controlling for age, gender, family affluence and negative life event (N=1290).



Note: * = $p < 0.05$, Grey colored arrows indicate insignificant pathway. Red arrows indicate significant pathways originating from contextual variables and black arrows indicate significant pathways involving intrapersonal and interpersonal predictors of DSH

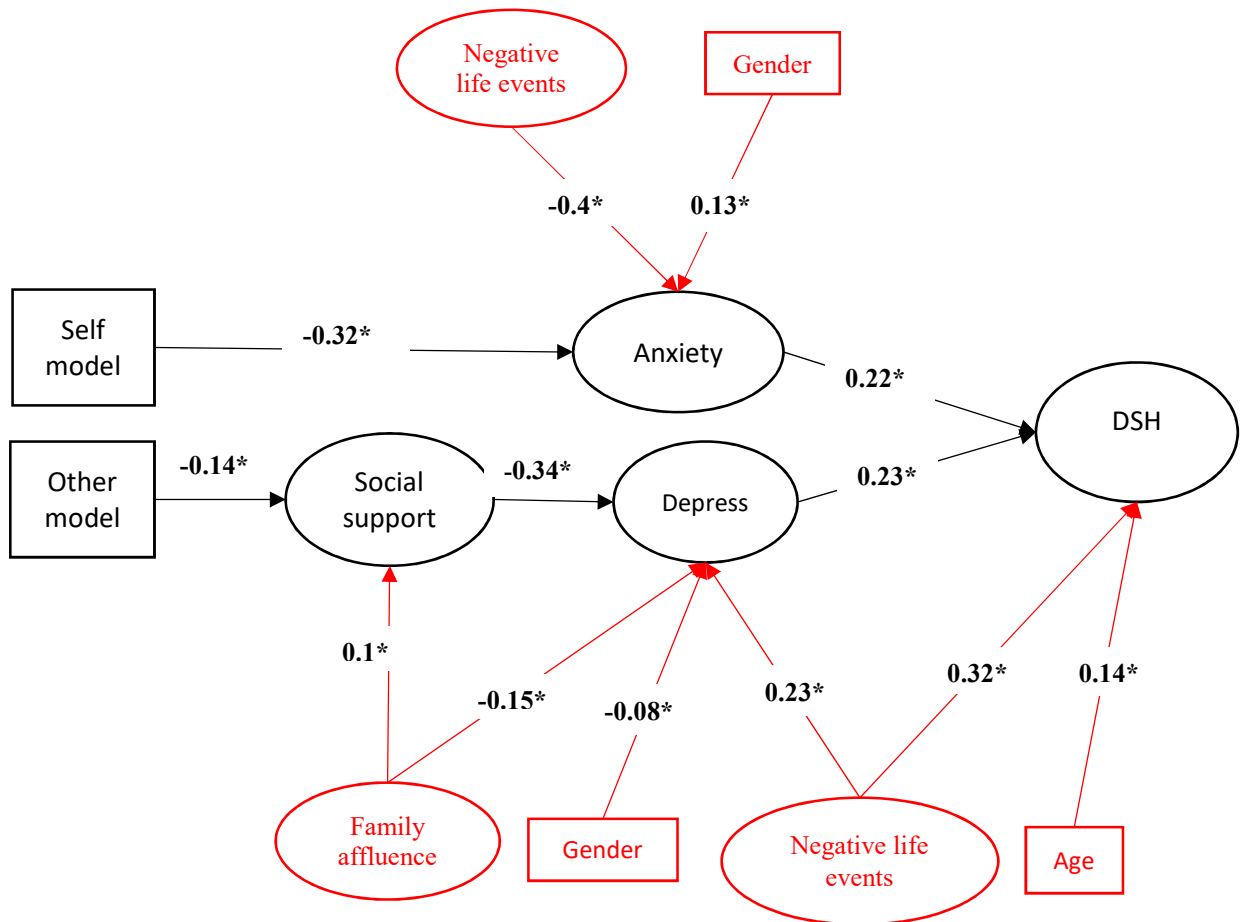
Modifications in the model were made based on theoretical assumptions and modification indices. Insignificant pathways were removed from the final model. Following is the summary of changes made in the model.

Changes made in the model

Changes were made in the model with respect to removing or modifying one hypothesized relationship at a time. As a first step for model modification, a new pathway was added from family affluence to social support based on the modification indices and literature review (Woodward, Chatters, Taylor, Neighbors, & Jackson, 2010). Secondly, insignificant pathways were removed from the model (age-depression, age-anxiety, family affluence- anxiety, family affluence-DSH, gender-DSH, self model-DSH, other model-DSH, other model-anxiety, self model-depression, other model-depression and self mode-social support). Despite these modification the model had poor fit (mean $\chi^2 = 1591.52$, $df = 1060$; mean $CFI = 0.82$; mean $RMSEA = 0.02$). Following is the diagrammatic presentation of this model.

Figure 5. 6

Diagrammatic presentation modified SEM model for association of attachment, social support, depression and anxiety, with DSH while controlling for age, gender, family affluence and negative life event (N=1290).



Note: $* = p < 0.05$, Red arrows indicate significant pathways originating from contextual variables and black arrows indicate significant pathways involving intrapersonal and interpersonal predictors of DSH

At this stage no further modification indices were available for model improvement however, with the removal of negative life events from the model the model fit became

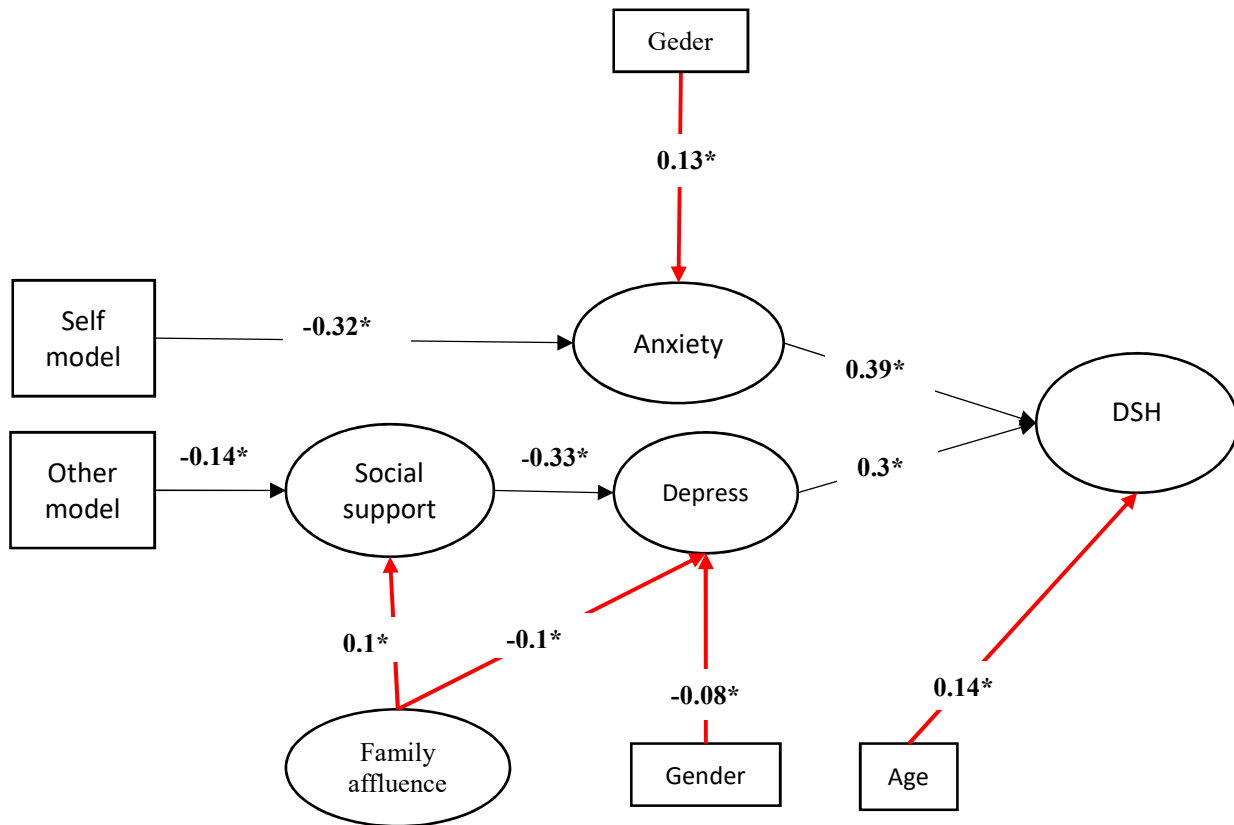
adequate. Therefore, in order to achieve an adequate model fit negative life events were removed from the model.

Final model

The final model had four latent predictors, five observed predictors, one outcome variable and 99 free parameters. The model fit is good with 898.22 mean χ^2 ($df=419$), 0.03 mean *RMSEA* and 0.9 mean *CFI*. For the purpose of clear presentation of the significant pathways obtained, following figure presents only structural part of the SEM.

Figure 5. 7

Diagrammatic presentation of significant pathways in final SEM model for association of attachment, social support, depression and anxiety, with DSH while controlling for age, gender and family affluence (N=1290).



This final model is similar to model 1 with two pathways emerging from self and other model of attachment mediated by social support, depression and anxiety. Age (0.14, $p= 0.01$) acted as moderator for predicting DSH whereas, association of gender was completely mediated by anxiety (0.13, $p= 0.000$) and depression (-0.08, $p= 0.03$). Results showed that girls were more likely to report higher scores on anxiety and boys were more likely to report higher scores on depression. Association of family affluence was mediated

through social support (0.1, $p=0.008$) and depression (-0.1, $p= 0.03$) leading to DSH. Increase in family affluence predicted increased social support and decreased depression.

DISCUSSION

The present study was aimed at understanding the interaction of attachment, social support, depression and anxiety as predictors of DSH. Attachment was considered as corner stone in understanding the interaction of predictors of DSH. It was hypothesized as a predictor that will not only influence DSH directly but through its predictors as well. Thus, in addition to direct pathways from self and other models of attachment, double mediational pathways from self and other models of attachment through social support, depression and anxiety were hypothesized in model 1. The model 2 was analyzed by controlling for age, gender, family affluence and negative life events. Section A of the discussion focusses on model 1 whereas section B focuses on pathways involving contextual factors in model 2.

A. MODEL 1

As a result of analyses of model 1 two significant pathways emerged; (1) self model → anxiety → DSH and (2) other model → social support → depression → DSH. The significant associations of predictors of DSH involved in these two pathways are discussed in this section.

Attachment as Predictor of DSH

Attachment played a central role in knitting the web of predictors and outcomes (as suggested by Bifulco & Thomas, 2013; Belsky & Cassidy, 1994). Yet, the two models of attachment exerted differential influence on other predictors of DSH. Self model was significantly associated with anxiety and other model with social support.

Association of self model of attachment with anxiety (pathway 1)

The effect of self model on anxiety is similar to previous research (e.g., Simonelli, Ray, & Pincus, 2004; Picardi et al., 2013). It is also partly in agreement with the study on Chinese University students (Jinyao et al., 2012) which concluded that anxious and avoidant attachment (i.e. negative self and other models) were associated with anxiety (Jinyao et al., 2012). In the present study only self model was associated with anxiety. It can be deduced here that anxiety is an intrapersonal concept, it is more influenced by self model (also intrapersonal in nature). The negative evaluation of self lead to problems with regulating emotions in the form of feeling fearful and anxious (Bifulco & Thomas, 2013).

Association of other model of attachment with social support (pathway 2)

The significant association of other model with perceived social support confirms the proposition that when the internalized aspect of others is projected onto others' expected and actual behavior, it shapes into the concept of perceived social support. The negative association of other model with social support is in contrast to the findings of

Shaver and Mikulincer (2002). Shaver and Mikulincer (2002) stated that those with fearful attachment styles (negative other model) will rely less on others. However, this can be explained in terms of the transitional state of Pakistani society; moving from collectivistic to individualistic position. Hence, individuals with more positive other model (expecting more social support) might report less social support due to the general change in society towards individualism. Here the important deduction to be made is the need to make adaptive changes in the concept of attachment and social support with respect to the transitional changes taking place in Pakistan. Among the examples of adaptive changes and required remedies is the possibility of educating adolescents and parents about expectations from others, and appropriately responding to others in daily routine and in times of distress. This can be targeted in parenting and self-grooming programs and awareness campaigns. By keeping the emotional bonds intact through enhancing attachments appropriately, the demographic transition taking place in Pakistan can be facilitated (for example movement from joint to nuclear family, migration of children to urban areas for better employment and education).

Association of social support with depression leading to DSH (pathways 2)

The results have shown that social support from family and friends acted as a psychological barrier against mental health problems as suggested by Cohen and Wills (1985). In agreement with exiting literature (Harrison, Dombrowski, Morse, Houck, Schlernitzauer, Reynolds III & Szanto, 2010; Chioqueta & Stiles, 2007; Tresno & Mearns, 2016) buffering effect of social support on other risk factors related to DSH was observed.

The association of social support with depression is also supported by Chioqueta and Stiles (2007), and Connor and Rueter (2006) studies. Model results showed that decrease in social support resulted in feeling depressed which compelled the adolescents to choose to express themselves through DSH (Nock, 2008). Therefore, through increasing social support (an inherent asset of the society), a robust and self-sufficient way of protection against depression (a global endemic) and eventually DSH can be established. Working on social support can also help to reduce stigma about mental health concerns particularly DSH in Pakistan.

Depression and Anxiety as Direct Predictors of DSH: Direct Associations in Pathways 1 & 2

The associations of depression and anxiety with DSH are in agreement with the hypothesized relationships and existing literature (Pollard & Lee, 2003; McMahon, Reulbach, Corcoran, Keeley, Perry & Arensman, 2010; Hawton, Rodham, Evans & Weatherall, 2002; O'Connor, Rasmussen & Hawton, 2009). The link of DSH with depression and anxiety can be considered as a property of elevated levels of negative emotions (depression and anxiety); and in order to alleviate these disrupted levels of negative emotions DSH is performed (Fliege, Lee, Grimm, & Klapp, 2009). Further, the direct association of depression and anxiety with DSH is important because depression and anxiety disorders are common mental disorders among adolescents (Kessler, Avenevoli, Merikangas, 2001; Chavira, Stein, Bailey, & Stein, 2004; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). This direct association raises alarm, as a very high rate

of depression and anxiety was found in the present study and study by Khalid (2015) which makes adolescents especially prone to DSH in Pakistan.

B. MODEL 2

In model 2, along with interpersonal and intrapersonal predictors of DSH age, gender, family affluence and negative life events were analyzed as contextual factors. Although, negative life events contributed to the model significantly but inclusion of negative life events led to a model with poor fit. Therefore, in the final model negative life events were excluded. In the final model, (1) one direct pathway from age to DSH, (2) two indirect pathways from gender to DSH which bifurcated through depression and anxiety and (3) two indirect pathways from family affluence; one through social support and other through depression led to DSH. Following is the discussion of each of the contextual predictor of DSH.

Age as Predictor of DSH

Increase in DSH with age is in agreement with previous studies. For example, Hawton and Harriss (2008) study which concluded that among adolescents DSH peaked around age 16 years. This is comparable to the results of the present study as most of the sample was from 10-16 years of age (92.57%). However, this also points out the need to explore how these trends change for late adolescence.

Gender as Predictor of DSH: Association of Gender and DSH Mediated by Depression and Anxiety

As hypothesized gender was found to be a significant predictor of depression and anxiety. In the present study gender acted only as an indirect predictor. These results are similar to WHO's (2016b) reports and other studies (e.g, McLean, Asnaani, Litz, & Hofmann, 2011) which state that females are more prone to mental health problems. However in contrast to WHO's report and existing research (e.g., Essau, Lewinsohn Seeley, & Sasagawa, 2009), male adolescents were more likely to report higher scores on depression, though the effect is very small. Research has shown that the gender differences in anxiety and depression can be attributed to stress response and exposure to certain stressors (Nolen-Hoeksema, 2001). Gender is an important factor to determine the differential power and exposure of males and females to specific stressors (WHO, 2016b). These stressors and responses vary according to cultural and social set up of the country. Where females are generally considered more oppressed and stressed, males in Pakistan might be more exposed to stressors due to current security situation in Pakistan. The less restricted mobility as compared to females makes them more vulnerable to social stressors like terrorism, economic pressures and other social factors. There is need to explore further the specific stressors to which male and female Pakistani adolescents are exposed in order to understand the gender related proneness to mental illnesses.

Family Affluence as Predictor of DSH

Family affluence only indirectly affected DSH through depression and social support.

Association of family affluence with depression leading to DSH

Low socioeconomic status has been reported to be associated with mental health problems in existing literature (Ibrahim, Kelly, & Glazebrook, 2013; Ardington & Case, 2010; Lorant, Deliege, Eaton, Robert, Philippot & Anseau, 2003). Similarly, in this study low family affluence predicted increase in depressive symptoms. However, there is also evidence which suggests that increase in socioeconomic status of parents is associated with increased depression (Yin, Heo, Subramanian, Kawachi, & Oh, 2010). While interpreting the findings of this study related to family affluence it must be considered that the sample was collected from state owned schools which are mostly opted by children of parents in low to middle income groups and the descriptive results also showed that most of the children identified themselves with low and middle family affluence. Hence, the results presented here provide a better picture of relationship of depression with low to middle family affluence but they are less representative of the changes associated with higher family affluence. Therefore, there is need to explore in future studies whether this relationship of family affluence with depression remains same or changes for higher family affluence.

Association of Family Affluence with Social Support Leading to DSH

For association of family affluence and social support, the pattern observed is in line with the developmental stage of the adolescents. Adolescents are dependent on their families for practical and emotional social support (Woodward, Chatters, Taylor, Neighbors, & Jackson, 2010). The association observed in the present study can be explained through research by Belle (1990). Belle (1990) purports that social networks of the people reporting lower socio economic status are characterized by unequal social exchanges. In such social exchanges a person might be more inclined to take advantage by receiving assistance and often fail to respond appropriately. These unbalanced social transactions are deleterious to perception of social support. Therefore, it is plausible that with increase in family affluence perceived social support increases. However, the effect of family affluence on social support and depression is so small that it must be studied further in future research before drawing any definite conclusion.

COMPARISON OF MODEL 1 WITH MODEL 2

In the present study, model 1 was tested for interaction of interpersonal and intrapersonal predictors of DSH whereas in model 2 effect of the contextual variables on the interaction of predictors of DSH was analyzed. Comparison of the two models show that the contextual variables added little to the model 2 in terms of the effects of contextual variables. This verifies that even when controlled for contextual variables the interaction of attachment with social support, depression, anxiety and DSH remains the same. It strengthens the evidence that the fundamental role of attachment remains significant

across cultures. It also shows the applicability and operational pathways of attachment in Pakistani culture for adolescents. However, by saying that interaction of attachment with other predictors and DSH remained the same even when controlled for contextual variables the role of contextual factors as predisposing conditions to DSH must not be undermined as they contributed significantly to the model.

LIMITATIONS AND RECOMMENDATIONS

Following are the limitations and recommendations for the present study.

1. An important limitation of the present study is exclusion of negative life events from the model despite their significant contribution. Negative life events have been identified as important predictors in attachment theory and research (Bifulco & Thomas, 2013). Future research endeavours must include negative life events to understand their contribution as predictor of DSH.
2. The direct and relatively strong association of depression and anxiety with DSH and very high rates of depression ((27.6%) and anxiety (47.5%) reported in the present study raise alarm. These close links between depression and anxiety show that adolescents are vulnerable to DSH in Pakistan. Therefore, any effort directed at exploring depression and anxiety symptoms must include an enquiry about DSH. Similarly, interventions aimed at reducing depression and anxiety must also include information about DSH.
3. The results of the present study also recommend that to alleviate the rates of

depression, anxiety and DSH interventions should focus on attachment and social support. With respect to Pakistani social context, where there is wide spread social insecurity, mental stress, and occurrence of social and familial transformations, enhancement of attachment behaviours can form an integral part of the required remedy. Similarly, social support can play an important role in reduction of mental health problems among adolescents. Furthermore, while designing those interventions focused on attachment and social support contextual variables must be considered.

CONCLUSION

From the models presented in this chapter it can be deduced that attachment is general vulnerability factor that influence social support, depression, anxiety and DSH but it exerts differential influence on different predictors of DSH. From these results it can also be construed that attachment plays a very important role in adolescent development in Pakistan, similar to Western conceptualizations. It is concluded that DSH must be understood from intrapersonal as well as interpersonal perspective and attachment can serve as useful framework to understand interaction of DSH and its other predictors.

CHAPTER 6

ASSOCIATION OF ATTACHMENT, DEPRESSION AND ANXIETY WITH DSH: ROLE OF INTERPERSONAL RELATIONSHIP PROBLEMS

INTRODUCTION

Throughout life development occurs within interpersonal contexts (Reis, Collins, & Berscheid, 2000; Bifulco & Thomas, 2013) and for the fulfilment of developmental demands individuals need to interact and associate with others i.e., individuals need to formulate interpersonal relationships (Bowlby, 1973). According to attachment theory, interpersonal interactions with significant others shape cognitive representations which subsequently guide the development of interpersonal styles of interaction with others (Bifulco & Thomas, 2013; Kocak & Onen, 2014). Through earlier interpersonal experiences later interpersonal experiences are shaped (Bifulco & Thomas, 2013; Reis, Collins, & Berscheid, 2000; Bowlby, 1973) which develop into a general model of interpersonal relationship style (Reis, Collins, & Berscheid, 2000). Since all development takes place in interpersonal contexts, any deviation in development leading to psychopathology will be embedded within the context of problems in interpersonal

relationships. Empirical research has shown that problems in interpersonal relationships are significant contributors to psychopathologies like DSH (Prinstein, Boergers, Spirito, Little, & Grapentine, 2000), depression and anxiety (e.g., Starr & Davila, 2008). To understand interpersonal relationship styles within developmental context and their role with respect to DSH, depression and anxiety, the literature review presented in this chapter will draw on interpersonal theory (Sullivan, 1953) and the formative role of attachment theory (Bowlby, 1973). Hypotheses derived from these theories will be discussed in relation to empirical evidence.

INTERPERSONAL RELATIONSHIP STYLES

According to Sullivan's interpersonal theory all social and emotional actions are done in order to avoid anxiety (Feist & Feist, 2008). However, consideration of all interpersonal tendencies as avoidance behaviors will be an unjustified reduction. It seems reasonable to also consider interpersonal tendencies as a drive to seek something. Considering these two main domains of drives related to interpersonal tendencies, Birtchnell proposed some forms of relating as desirable and constructive (positive), and others as undesirable and destructive (negative). This suggests a biaxial system of styles of relating. In this biaxial system of relating, horizontal axis represents close-distant dimension and vertical axis indicates need to relate from a position of inferiority versus superiority (Birtchnell, 2014). These two axes were termed as agency and communion by Horowitz (2004). Between these two axes are intermediate positions (Birtchnell, 2014; Horowitz, 2004). The four poles of the two axes and four intermediate positions form eight

main domains of interpersonal relationship styles: domineering, vindictive, cold, socially avoidant, non-assertive, exploitable, overly nurturant and intrusive. This octagonal approach is also described by Leary (1957) by arranging the two axes (i.e., love-hate and dominate-submit) in a circle to obtain divisions of interpersonal styles (Gurtman, 2009). Leary proposed that all of these interpersonal octants are aimed at reducing anxiety and maintaining self-esteem (Kiesler, 1996). An excess of all of these domains is considered indicative of a problem in interpersonal relationships (Alden, Wiggins, & Pincus, 1990). This octagonal profile of interpersonal relationship styles has been used in research to understand association of interpersonal relationships with mental health. In general, the superfluity of any of these interpersonal relationship styles is considered problematic and a vulnerability to mental health problems.

Interpersonal theory also provided the bridging link between interpersonal relationship styles and mental health problems. The theory posits that two interacting individuals formulate a guide for each other's behaviors as they interact (Horowitz, Rosenberg, & Bartholomew, 1993). Therefore, behaviors and emotions are produced based on a person's typical versions of the agentic and communal aspects of situations to avoid anxiety or achieve relating objective (Pincus, Lukowitsky, Wright, & Eichler, 2009). However, when the typical versions of interpersonal styles do not let the individuals avoid anxiety or achieve relating objective, they experience emotional distress which will open a window for psychopathologies (Hanken & Abela, 2005). The effects of the interpersonal relationship style problems on mental health have been known to be so severe that they can lead to severe self-destructing behaviors like DSH (Prinstein, Boergers, Spirito, Little,

& Grapentine, 2000). The next section will explain the link between interpersonal relationship styles and DSH.

INTERPERSONAL RELATIONSHIP STYLE PROBLEMS AND DSH

Problems in interpersonal relationships are linked with DSH both in community and clinical samples (Prinstein, Boergers, Spirito, Little, & Grapentine, 2000). Brunner, Parzer, Haffner, Steen, Roos, Klett and Resch (2007) described specifically female DSH profile as the one having relationship difficulties with parents and friends. On the other hand, a large USA study recruited 20,745 adolescents (48% males) to test the importance of interpersonal relationships in DSH. The study concluded that males with history of DSH had poor peer relationships. The study also pointed out that interpersonal relationships with different individuals such as, parents and peers can compensate for each other. In this study poor peer relationships were compensated by improved relationships with parents and school (Kidd, Henrich, Brookmeyer, Davidson, King, & Shahar, 2006). It can be deduced here that the difficulties in styles of interpersonal relationship seems to be more related with DSH rather than the difficulties within any particular relationship (e.g., peers). This is in line with the theoretical proposition that interpersonal interactions with various significant others get formulated into a general model of interpersonal relationship style (Reis, Collins, & Berscheid, 2000). Nonetheless, Kidd, Henrich, Brookmeyer, Davidson, King, & Shahar (2006) results' support for this proposition should be considered with caution as the study did not directly test the role of overall interpersonal relationship style in DSH.

The association of interpersonal relationships and DSH had also been explored with respect to the various functions of DSH and interpersonal relationship style problems. In a study conducted on 173 individuals (162 females), association of interpersonal relationship style problems (along with other emotional factors) with five common functions of DSH was studied (Turner, Chapman, & Layden, 2012). The functions of DSH (non-suicidal in this study) included emotional relief, feeling generation, self-punishment, interpersonal influence and communication. Results indicated that overall problems in interpersonal relationship styles (measured by Inventory of Interpersonal Problems) were associated with emotional relief, feeling generation and self-punishment, whereas for interpersonal influence and communication function of DSH, different problems in interpersonal relationships were associated with different functions of DSH. For example, interpersonal influence function was associated with a domineering or a controlling and an intrusive or a needy interpersonal style. This association shows that DSH is used as an expression of wish to control environment or others. It further denotes the concurrent high need for affiliation and expression of distress. Hence, it can be seen that DSH is a maladaptive exercise of interpersonal communication and expression of emotions (Turner, Chapman, & Layden, 2012).

The importance of interpersonal factors in DSH is also asserted in theories of DSH. In order to explain DSH with suicidal intent Joiner (2005) proposed a theory explaining the role of three interacting components in suicidal DSH; thwarted belongingness, perceived burdensomeness and the acquired capability to enact lethal DSH. According to Joiner, the need to belong and make useful contribution to one's social circle is imperative

for healthy existence. But if this need is unfulfilled then the chance of DSH with suicidal intent is increased (Nock, 2014). An empirical study conducted by Joiner, Orden, Witty, Ribeiro, Lewis and Rudd (2009) on 313 individuals (257 males) with mean age of 22.17 years provided evidence for the combination of the perceived burdensomeness and thwarted belongingness leading to suicidal ideation. Another study indicated that the combination of both perceived burdensomeness and thwarted belongingness was not necessary instead thwarted belongingness was more evident than perceived burdensomeness in 42.5% of the suicides ($N=664$) as compared to 15.5% perceived burdensomeness (Lester & Gunn, 2012). It must be bear in mind that where this study presented the seminal importance of interpersonal factors (i.e., belongingness/relatedness), it only examined suicide notes which may or may not contain full information regarding circumstances surrounding the person who wrote the note.

Other studies on adolescents have also reported the importance of interpersonal factors. For example, step wise regression analyses conducted by Opperman, Czyz, Gipson and King (2015), on 129 adolescents (12-15 years old) concluded that low connectedness with family was significant predictor of suicidal ideation. However, this study also had an important bias to be interpreted as a reassuring proof for significance of interpersonal factors in DSH as it focused on adolescents with low connectedness (inclusion criteria) only. The study also simply concentrated on suicidal ideation and excluded DSH cases specifically. The deduction that can be made here is that interpersonal factors have been given seminal importance in theories and research on DSH. Furthermore, like many other studies these studies on Joiner's theory did not consider a

continuum approach for DSH but taken together it seems that problems in interpersonal domain are connected with increase in DSH including its ideation and the extreme act of suicidal DSH. Hence to address the question of the link between interpersonal relationship style problems and DSH, it is hypothesized that excess of problematic interpersonal relationship styles will be associated with increase in DSH in the present study.

Now to understand the pathways of interaction of predictors of DSH, the evidence for the interaction of interpersonal relationship problems with other predictors of DSH needs to be reviewed. As it has already been established in the preceding chapter that depression and anxiety are the closest predictors of DSH, in the next section the evidence for moderating or mediating interaction of problematic interpersonal relationship styles with depression and anxiety will be reviewed.

INTERACTION OF INTERPERSONAL RELATIONSHIP STYLE PROBLEMS WITH DEPRESSION AND ANXIETY

In addition to being a risk factor for DSH, problems in interpersonal relationships influence depression and anxiety. A comparative study on 64 diagnosed depression patients and 71 volunteers without depressive symptoms (18-56 years old adults) showed in regression analysis that the depressed group expressed more interpersonal relationship style problems along with internalized anger and negative self-perceptions than the non-depressed one (Sahin, Batigun, & Koc, 2011). Studies on adolescents also indicate the role

of various interpersonal factors in psychological distress. Kenny, Dooley and Fitzgerald (2013) concluded that high levels of criticism and exclusion were associated with increased depression, anxiety and stress among 260 adolescents (12-18 years old). La Greca and Harrison (2005) found that relational victimization and negative interactions in relationship with best friends predicted increase in social anxiety among 421 adolescents (14-19 years old). Brito, Paula, Pinheiro, & Monteiro (2015) also reported that poor quality of relationship with father and mother predicted depression ($N=433$, 13-17 years age). Another study found moderate associations of peer relationships with anxiety and depression in adolescents ($N=6903$, 10-17 years age). Those with comorbid depression and anxiety reported least positive peer relationships (de Matos, Barrett, Dadds, & Shortt, 2003). In this study, adolescents in depressed group reported worse peer relationships than those in anxiety group (de Matos, Barrett, Dadds, & Shortt, 2003). This indicates the possibility of differential association of interpersonal factors with depression and anxiety (as was the case with social support and attachment in chapter 5). These and most other studies explored various interpersonal factors such as, quality of peer, parental and romantic relationships. Nevertheless there is paucity of research on adolescents' own interpersonal relationship style, depression and anxiety.

There are some studies on adult samples that provide evidence for association of interpersonal relationship styles with depression and anxiety. For instance, McEvoy, Burgess, Page, Nathan and Fursland (2013) used Inventory of Interpersonal Problems-32 (Barkham, Hardy, & Startup, 1996) in clinical sample (78.4% women) to explore the association of the eight problematic relationship styles with depression, anxiety ($N= 504$)

and eating disorders ($N=309$). There was significant association of all relationship styles with depression and anxiety in regression analysis except for too much openness. It seems that generally all relationship styles contribute to the development of depression and anxiety but it must be kept in mind that most of the participants were females in this study and female gender has been associated with more interpersonal problems, depression and anxiety (WHO, 2016). Even though there is theoretical evidence that problematic styles of interpersonal relationships contribute to psychopathology and the octagonal model of interpersonal relationship styles can contribute to understanding psychopathology in the interpersonal context, there is not much empirical evidence. Most empirical studies focus on particular elements of interpersonal factors and interpersonal relationship style but the overall increase in problems in interpersonal styles is not well researched with respect to depression, anxiety and DSH among adolescents. Moreover, interpersonal problems are frequently found to be central to mental health concerns and serve as a common motive for seeking treatment (Horowitz, 2004). Hence, based on interpersonal theory discussed in previous sections and the empirical evidence showing role of interpersonal factors in psychopathology, it is hypothesized that problematic interpersonal relationship styles will be associated with increase in depression and anxiety among Pakistani adolescents.

Now, the next section will address the question of how interpersonal relationship styles develop within the developmental context.

INTERPERSONAL RELATIONSHIP PROBLEMS CONCEPTUALIZED IN ATTACHMENT FRAMEWORK

As mentioned earlier, problems in relationship style domain are ubiquitous predictors of psychopathology. But where do these problems in interpersonal relationship styles originate from. Horowitz, Rosenberg and Bartholomew (1993) suggested that interpersonal problems depict behavioral penalties of transmutations in attachment representations. Attachment theory conceptualized development in the form of a child relating to his/her caregiver. Through activation of attachment system the need of an individual to develop sufficient confidence for moving away from of the caregiver, function independently and the ability to seek proximity and support when required is addressed. In interpersonal theory, it is interpreted as an achievement of positive distance (Birtchnell, 2012). In order to achieve this positive distance certain ways of interactions are established. The styles of interpersonal interactions are embed in the repeated interactions with caregivers that lead to cognitions about self and others. The subsequent ways of interaction with others are decided based on these positive and negative cognitions classified into four attachment styles (Cassidy & Shaver, 2008).

The attachment styles develop interactively into patterns of interpersonal relationships with significant others such as, peers (Cassidy & Shaver, 2008). Examination of relationship between attachment styles and interpersonal relationships showed the influence of attachment styles on interpersonal relationships (Horowitz, Rosenberg, & Bartholomew, 1993). According to attachment theory, this takes place via establishing

working models of attachment which then get translated into interpersonal relationship styles (Bowlby, 1980). When a conflict arises between an individual's desire to exhibit a certain behavior (e.g., seeking support when distressed) and the anxiety experienced due to the anticipated negative response from a caregiver, maladaptive patterns of interpersonal behaviors are exhibited to avoid that anxiety. These maladaptive patterns develop gradually based on the interpersonal learning history (Cassidy & Shaver, 2008). Hence, interpersonal relationships can be seen as a function of how others respond to the self and how self reacts to other's reactions (Cassidy & Shaver, 2008). It is well recognized now that cognitions about others and one's connection with them play a prominent part in development of interactional styles within relationship contexts (Reis, Collins, & Berscheid, 2000; Bifulco & Thomas, 2013; Andersen & Chen, 2002; Baldwin, 1992). For instance, Horowitz, Rosenberg and Bartholomew (1993) noted that individuals with insecure attachment styles showed more problems in interpersonal relationships than the secure ones. Among Spanish adolescents ($N= 513$) attachment with parents was associated with intimacy with peers and this association remained same for 13, 15 and 18 years of age. Most of the studies provide general evidence for association of attachment with interpersonal relationships among adolescents. There is paucity of research conducted exclusively on adolescent sample using interpersonal relationship problems and working models of attachment. As stated in the earlier section, the research conducted on adult samples (some including adolescent respondents as well) can be used as a guide to understand the relationship of attachment with interpersonal relationship problems.

A study conducted on 50 men and 50 women (16-30 years old) asserted that specific attachment styles are associated with specific problems in interpersonal relationship styles. Attachment scores of 25 dyads (each in competitive and cooperative experimental situations) were correlated with interpersonal relationship styles (Xue & Zhao, 2011). On Leary's biaxial circle (consisting of control and affiliation axes), those with more secure attachment were more inclined to have more control and moderate to high affiliation. Respondents with high scores on ambivalence showed moderate control but both low and high affiliation tendencies. High scores on fearful attachment showed low control and low to moderate affiliation in interpersonal relationship styles. Lastly, high scorers on dismissive attachment showed high control and affiliation scores. The correlations between these dimensions of interpersonal styles and attachment are in correspondence with both attachment and interpersonal theory. For instance, in case of fearful attachment group (that experienced the fear of frightening caregiver and the concurrent need to draw near to the caregiver in times of need), low control and low to moderate affiliation in interpersonal relationship styles was exhibited. In order to avoid experiencing anxiety because of this dilemma they exerted less control in interpersonal situation; and to maintain self-esteem they showed less affiliation (Xue & Zhao, 2011). Results of this study present a valuable insight into the relationship of attachment and interpersonal style problems but the method and analyses presented in this study is vague which weakens the strength of the conclusions that can be drawn from the study. Furthermore, adolescents were included in the sample but their proportion was not indicated. In addition to this, the study recognized that working models of attachment serve as building blocks for attachment styles but did not exclusively looked into the contributions of these cognitive

representations of self and others in interpersonal relationship style problems. Nevertheless, the similarity of Xue and Zhao's (2011) results with a study by Gostas, Wiberg, Engstrom and Kjellin (2012) on a sample with diagnosed mental health conditions demonstrates valuable contribution of Xue and Zhao's (2011) study. Gostas, Wiberg, Engstrom and Kjellin (2012) studied 168 individuals diagnosed with depression, anxiety, adjustment, personality and other disorders. The study concluded that avoidant and anxious attachment styles correlated positively with interpersonal problems of dominance and affiliation (Gostas, Wiberg, Engström, & Kjellin, 2012).

In another study, Stepp, Morse, Yaggi, Reynolds, Reed and Pilkonis (2008) demonstrated the mediating role of interpersonal difficulties in association of working models of attachment with DSH ($N = 406$, 84% patients from a psychiatric clinic). It was concluded that attachment anxiety was associated with past suicidal and non-suicidal DSH and the distress related to interpersonal difficulties (such as, distress related to difficulties with ignoring criticism) partially explained the effect of attachment on DSH. This study used interviews to classify attachment styles and a self-report scale that measured distress arising from interpersonal sources. The interview also explored developmental history, symptoms and personality characteristics. Based on this information, participants' were classified as experiencing attachment anxiousness and attachment avoidance. Where this study pointed the importance of considering interpersonal relationship style problems as mediating factor in relation to working models of attachment an equivocal methodology was used in it.

The mediating role of interpersonal relationship styles has been observed in association of attachment with other outcome variables as well. Such as, in a study on 123 men on probation for interpersonal partner violence, hostile dominant interpersonal problems acted as mediator for the association of avoidant attachment with violence severity and psychological aggression (Lawson & Malnar, 2011). These findings are in line with theoretical proposition of attachment theory that is development (normal or deviant) occurs within interpersonal contexts.

There are some other studies as well which included adolescents and claimed significant association of attachment with interpersonal relationships (e.g, Nyarko, Addai, & Amissah, 2014; Johnson, Cohen, Gould, Kasen, Brown, & Brook, 2002). However, a closer look at these studies show that they are not entirely effective at exploring the association of attachment and interpersonal relationship styles. Such as, the Nyarko, Addai and Amissah (2014) study claimed to measure association of childhood attachment with current interpersonal relationships but the scales that they employed measured attachment with parents (Parent Attachment Questionnaire) and attachment in general (Relationship Scales Questionnaire). Similarly, Johnson, Cohen, Gould, Kasen, Brown and Brook (2002) reported mediation role of interpersonal difficulties in maladaptive parenting, childhood maltreatment and suicidal DSH but it used highly criticized method of regression analysis to test mediation. The study did not include measures of attachment specifically, and for interpersonal difficulties life events checklist was used.

Hence, the need to consider working models of attachment in relation to the octagonal model of interpersonal relationships and the mediational role of interpersonal relationship styles remains to be addressed. Therefore, based on the theoretical and empirical literature reviewed in this section it is hypothesized that both self and other models of attachment will influence interpersonal relationship style problems which will in turn influence DSH directly and through depression and anxiety.

CONTEXTUALIZING THE RELATIONSHIP OF ATTACHMENT, INTERPERSONAL RELATIONSHIP STYLE PROBLEMS, DEPRESSION, ANXIETY AND DSH

In western research, interpersonal factors have been found to be more significantly associated with DSH without suicidal intent group (Groholt, Ekeberg, & Haldorsen, 2000). However, in Pakistani hospital samples, poor interpersonal relationships were found to be equally associated with both suicidal and non-suicidal DSH. It was the most common reason for DSH (Shahid & Hyder, 2008). This difference emphasize the need to understand interaction of interpersonal relationships with DSH and its other predictors within indigenous contexts. In the present study, four contextual variables have been considered in this respect; age, gender, family affluence and negative life events. As discussed in previous chapter and chapter 1, these four contextual variables are associated with depression anxiety and DSH. In addition to these influences of selected contextual variables, the question that arises here is whether interpersonal relationship style also vary in accordance with these contextual variables or not. Evidence from literature shows that

gender and age exert influence on interpersonal relationship styles. Gender is well recognized as predictor of interpersonal problems (WHO, 2016b). For example, Brunner, Parzer, Haffner, Steen, Roos, Klett and Resch (2007) reported that females report more interpersonal problems related to DSH. Gender as well as age related differences were observed in a study on 185 respondents of 13 – 99 years age. Adolescents and young adults were found to be more likely than older adults to show more intense aversive reaction and anger in response to interpersonal problems (Birditt & Fingerman, 2003). Hence, in the present study it is hypothesized that age and gender influence interpersonal relationship style problems.

OBJECTIVES

Following are the objectives of the study

3. To understand the interaction of interpersonal relationship style problems with DSH and its predictors including attachment, depression and anxiety.
4. To explore the hypothesized relationship of attachment, interpersonal relationship style problems, depression and anxiety with DSH within the context of gender, age, family affluence and negative life events.

HYPOTHESES

Following hypotheses were formulated in this chapter for testing two SEM models

1. Model 3

Association of self and other model of attachment with DSH is doubled mediated by interpersonal relationship style problems, depression and anxiety. This double mediation is partial as attachment not only influences interpersonal relationship style problems directly it also directly influences depression, anxiety and DSH. Similarly, depression and anxiety partially mediate the association of interpersonal relationship style problems with DSH.

Following is an elaborated picture of the hypothesized pathways.

Direct pathways

1a. Adolescents with low scores on self and other models of attachment, increased interpersonal relationship style problems, depression and anxiety will report more DSH.

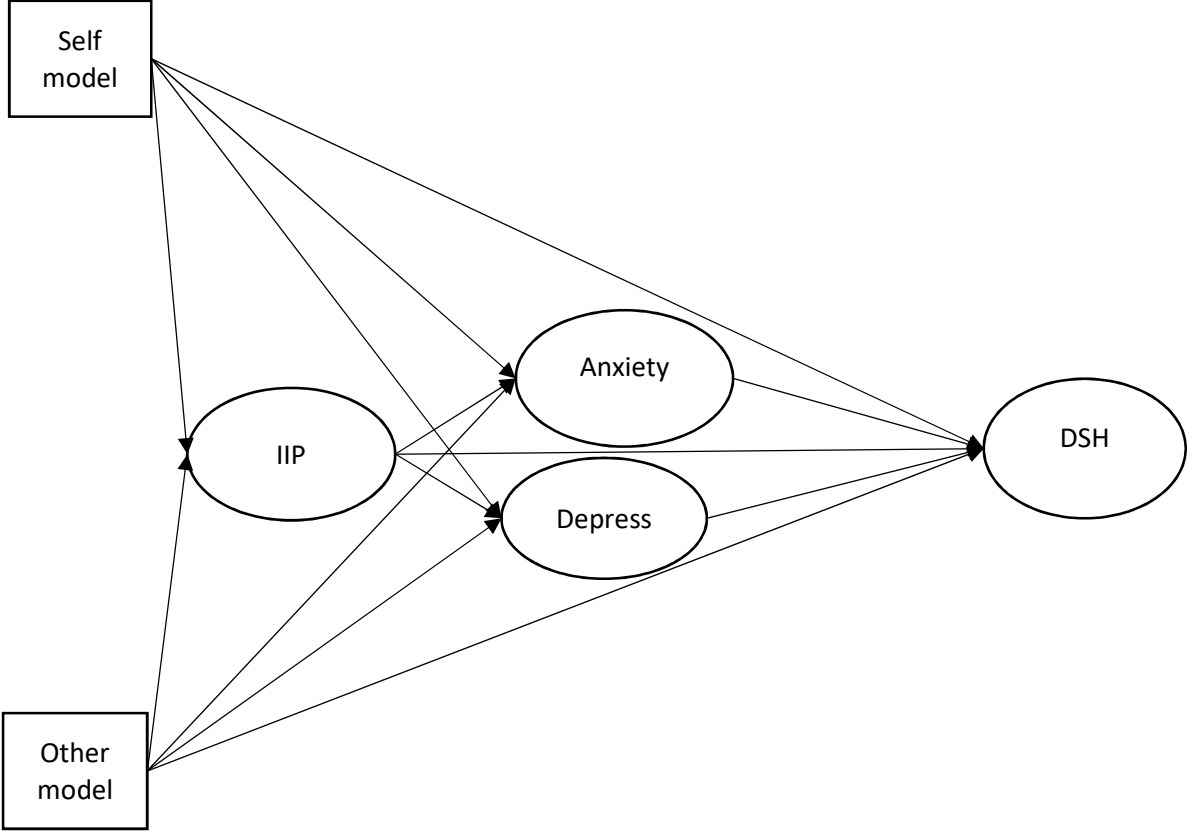
Mediation pathways

1b. Adolescents with low scores on self and other models of attachment will have more interpersonal relationship style problems which will lead to high depression and anxiety and both depression and anxiety will then lead to increased DSH.

Following is the diagrammatic presentation of the hypothesized direct and indirect pathways.

Figure 6. 1

Diagrammatic presentation of hypothesized pathways in model 3 for association of attachment, interpersonal relationship style problems, depression and anxiety with DSH.



Note: IIP = interpersonal relationship style problems; Depress= depression; DSH= deliberate self-harm

2. Model 4

Age, Gender, family affluence and negative life events act as moderators for predicting DSH. They influence DSH through depression and anxiety as well. Age and gender also influence interpersonal relationship style problems.

Following are the specific hypotheses formulated for this model.

Direct pathways

2a. Increase in age, female gender, lower family affluence and increase in negative life events will lead to increase in DSH.

Indirect pathways

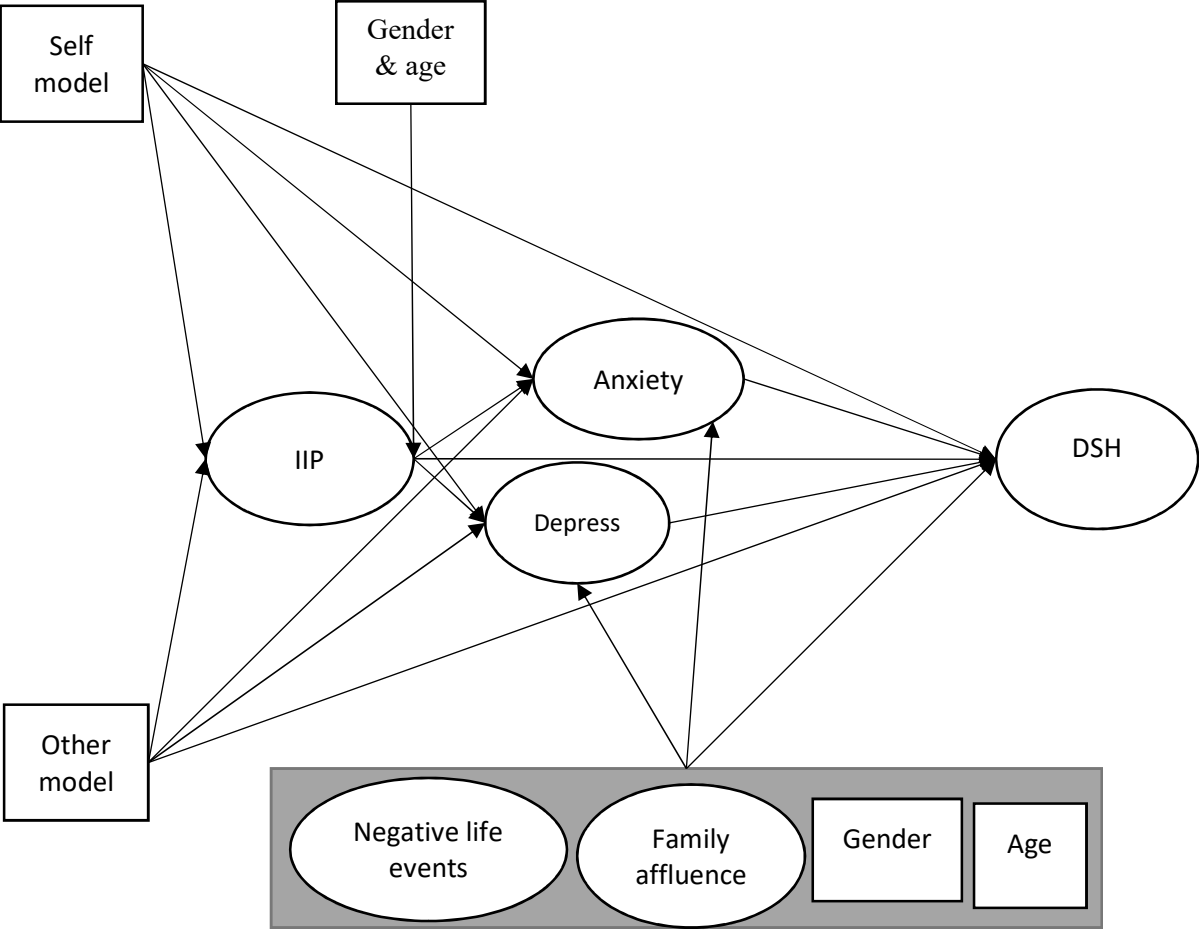
2b. Increase in age and female gender are positively associated with more interpersonal relationship style problems leading to DSH directly and through depression and anxiety.

2c. Increase in age, female gender, lower family affluence and increase in negative events will lead to higher scores on depression and anxiety which will in turn predict increased DSH.

These hypotheses are diagrammatically presented in the following figure.

Figure 6. 2

Diagrammatic presentation of hypothesized pathways in model 4 for association of attachment, interpersonal relationship problems, depression and anxiety, with DSH while controlling for age, gender, family affluence and negative life event.



Note: IIP = interpersonal relationship style problems; depress= depression; DSH= Deliberate self-harm

METHOD

Data was collected from 1420 Pakistani school going adolescents. Translated versions of self-report psychological instruments were administered in group setting on 10-19 years old adolescents within school settings. In this survey self and other models of attachment were measured using Adolescent Relationship Scales Questionnaire (Scharfe, 1996); DSH was measured with items from Youth Health Risk Behaviour Survey (2011 version) developed by Centre for Disease Control and Prevention (CDC); Inventory of Interpersonal Problems-32 (IIP-32) (Horowitz, Alden, Wiggins, & Pincus, 2000) was used for measuring interpersonal relationship style problems; and Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) was used for measuring depressive and anxiety symptoms. Information about age and gender was obtained in demographic pro forma along with other demographic variables. Family affluence scale-II (FAS-II) (Boyce, Torsheim, Currie, & Zambon, 2006) was used for socioeconomic status and negative life events were measured through negative life event items obtained from Child and Adolescent Self-harm in Europe questionnaire (O'Connor, Rasmussen, & Hawton, 2009).

After exclusion of 128 cases with more than 50% missing data and performing multiple imputation in SPSS 20, a total of 1290 cases were available for SEM analyses. The univariate analyses of the data is presented in descriptive results chapter. Bivariate associations and SEM were conducted for hypothesized relationships. The detail description of the analyses is presented in chapter 2 on methods. For structural equation modelling both structural (i.e., factor analyses) and measurement models were built. The

structural model in the form of factor analyses is presented in the chapter on translation and adaptation of scales. In order to avoid repetition as much as possible, only the results of bivariate associations and measurement models are presented here in this chapter.

RESULTS

In this section results of bivariate associations and SEM model 3 of attachment, interpersonal relationship style problems, depression, anxiety and DSH are presented. This is followed by results of model 4 that was analyzed while controlling for contextual factors.

BIVARIATE ASSOCIATIONS

The bivariate associations of overall interpersonal relationship style problems and its subscales with self and other models of attachment, DSH, depression and anxiety are presented in the following table. Increase in all domains of interpersonal style problems is significantly associated with increase in DSH, depression and anxiety, except for insignificant association of depression with intrusive subscale, and significant but inverse association with over nurturant subscales. All domains of interpersonal relationship style problems are negatively associated with both self and other models of attachments except for over nurturant and intrusive subscales which are insignificantly associated with other model.

Table 6. 1

Pooled results for associations of self and other models of attachment, interpersonal relationship style problems, depression, anxiety and DSH (N=1290).

| | DSH | Self | Other | Dep | Anx | IIPT | D | V | C | S | N | E | O | I |
|--------------|-----|--------------|-------------|----------------|----------------|----------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| DSH | - | 0.06* | 0.01 | 0.12* | 0.19* | 0.14** | 0.12** | 0.07* | 0.07* | 0.11** | 0.08** | 0.13** | 0.01** | 0.04** |
| Self | - | - | 0.1* | -0.92** | -0.28** | -0.17** | -0.07* | -0.1** | -0.1** | -0.16** | -0.16** | -0.18** | -0.08** | -0.08** |
| Other | - | - | - | -0.02 | -0.9** | -0.14** | -0.04* | -0.08** | -0.17** | -0.12** | -0.15** | -0.13** | -0.02 | -0.03 |
| Dep | - | - | - | - | 0.22* | 0.11** | 0.1** | 0.1** | 0.12** | 0.13** | 0.12** | 0.1** | -0.08** | -0.01 |
| Anx | - | - | - | - | - | 0.27** | 0.19** | 0.16** | 0.17** | 0.19** | 0.21** | 0.26** | 0.14** | 0.15** |
| IIPT | - | - | - | - | - | - | 0.54** | 0.7** | 0.75** | 0.75** | 0.73** | 0.68** | 0.48** | 0.54** |
| D | - | - | - | - | - | - | - | 0.29** | 0.27** | 0.27** | 0.25** | 0.34** | 0.26** | 0.42** |
| V | - | - | - | - | - | - | - | - | 0.6** | 0.52** | 0.49** | 0.32** | 0.18** | 0.15** |
| C | - | - | - | - | - | - | - | - | - | 0.59** | 0.54** | 0.42** | 0.18** | 0.91** |
| S | - | - | - | - | - | - | - | - | - | - | 0.59** | 0.48** | 0.17** | 0.28** |
| N | - | - | - | - | - | - | - | - | - | - | - | 0.47** | 0.19** | 0.28** |
| E | - | - | - | - | - | - | - | - | - | - | - | - | 0.29** | 0.41** |
| O | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.41** |
| I | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Note: ** = $p < 0.01$; * $p < 0.05$; DSH= deliberate self-harm; dep= depression; anx= anxiety; IIPT= total score on interpersonal relationship style problems; D= domineering; V= vindictive; C= cold; S= socially avoidant; N= non-assertive; E= exploitable; O=over nurturant; I= intrusive

The bivariate associations of age, gender, family affluence and negative life events with DSH, depression, anxiety and interpersonal relationship problems are presented in the following tables.

Table 6. 2

Pooled results for associations of age, family affluence (FA), negative life events (LES), DSH, depression (dep), anxiety (anx) and interpersonal relationship style problems (N=1290).

| | Age | FA | LES | DSH | Dep | Anx | IIPt | D | V | C | S | N | E | O | I |
|-------------|-----|---------------|---------------|---------------|---------------|--------------|----------------|---------------|----------------|----------------|----------------|---------------|---------------|----------------|---------------|
| Age | - | 0.12** | 0.06* | 0.1** | -0.00 | -0.04 | 0.14** | 0.08** | 0.01 | 0.01 | 0.06* | 0.1** | 0.09** | 0.11** | 0.16** |
| FA | - | - | 0.11** | 0.11** | -0.1** | -0.05 | -0.08** | 0.02 | -0.07** | -0.07** | -0.08** | -0.07* | -0.07* | -0.05 | 0.02 |
| LES | - | - | - | 0.23** | 0.07** | 0.3** | 0.14** | 0.14** | 0.03 | 0.06* | 0.09** | 0.11* | 0.18** | 0.04 | 0.11** |
| DSH | - | - | - | - | 0.12* | 0.19* | 0.14** | 0.12** | 0.07* | 0.07* | 0.11** | 0.08** | 0.13** | 0.01** | 0.04** |
| Dep | - | - | - | - | - | 0.22* | 0.11** | 0.1** | 0.1** | 0.12** | 0.13** | 0.12** | 0.1** | -0.08** | -0.01 |
| Anx | - | - | - | - | - | - | 0.27** | 0.19** | 0.16** | 0.17** | 0.19** | 0.21** | 0.26** | 0.14** | 0.15** |
| IIPt | - | - | - | - | - | - | - | 0.54** | 0.7** | 0.75** | 0.75** | 0.73** | 0.68** | 0.48** | 0.54** |
| D | - | - | - | - | - | - | - | - | 0.29** | 0.27** | 0.27** | 0.25** | 0.34** | 0.26** | 0.42** |
| V | - | - | - | - | - | - | - | - | - | 0.6** | 0.52** | 0.49** | 0.32** | 0.18** | 0.15** |
| C | - | - | - | - | - | - | - | - | - | - | 0.59** | 0.54** | 0.42** | 0.18** | 0.91** |
| S | - | - | - | - | - | - | - | - | - | - | - | 0.59** | 0.48** | 0.17** | 0.28** |
| N | - | - | - | - | - | - | - | - | - | - | - | - | 0.47** | 0.19** | 0.28** |
| E | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.29** | 0.41** |
| O | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0.41** |
| I | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Note: ** = $p < 0.01$; * $p < 0.05$; FA= family affluence; LES= negative life events; DSH= deliberate self-harm; dep= depression; anx= anxiety; IIPt= total score on interpersonal relationship style problems; D= domineering; V= vindictive; C= cold; S= socially avoidant; N= non-assertive; E= exploitable; O=over nurturant; I= intrusive

Table 6. 3

Pooled mean ranks for association of gender with DSH, depression, anxiety and interpersonal relationship style problems (N=1290).

| | Gender | |
|--|-------------------------|---------------------------|
| | Male (n=707) | Female (n=583) |
| DSH | 640.65 | 651.38 |
| Depression | 656.04 | 651.38 |
| Anxiety | 603.45 | 696.49 |
| Interpersonal relationship style problems | 598.95 | 701.95 |
| Domineering | 645.83 | 645.1 |
| Vindictive | 597.04 | 704.27 |
| Cold | 598.98 | 701.92 |
| Social avoidant | 617.31 | 679.69 |
| Non assertive | 603.71 | 696.18 |
| Exploitable | 614.31 | 683.32 |
| Over nurturant | 612.04 | 686.07 |
| Intrusive | 642.49 | 649.15 |

For all imputed data sets, the difference in mean ranks of males and females was significant ($p < 0.01$) for overall interpersonal relationship style problems, vindictive, cold, avoidant, assertive, exploitable and nurturant.

MODEL 3: ASSOCIATION OF ATTACHMENT, DSH, DEPRESSION AND ANXIETY: ROLE OF INTERPERSONAL RELATIONSHIP STYLE PROBLEMS

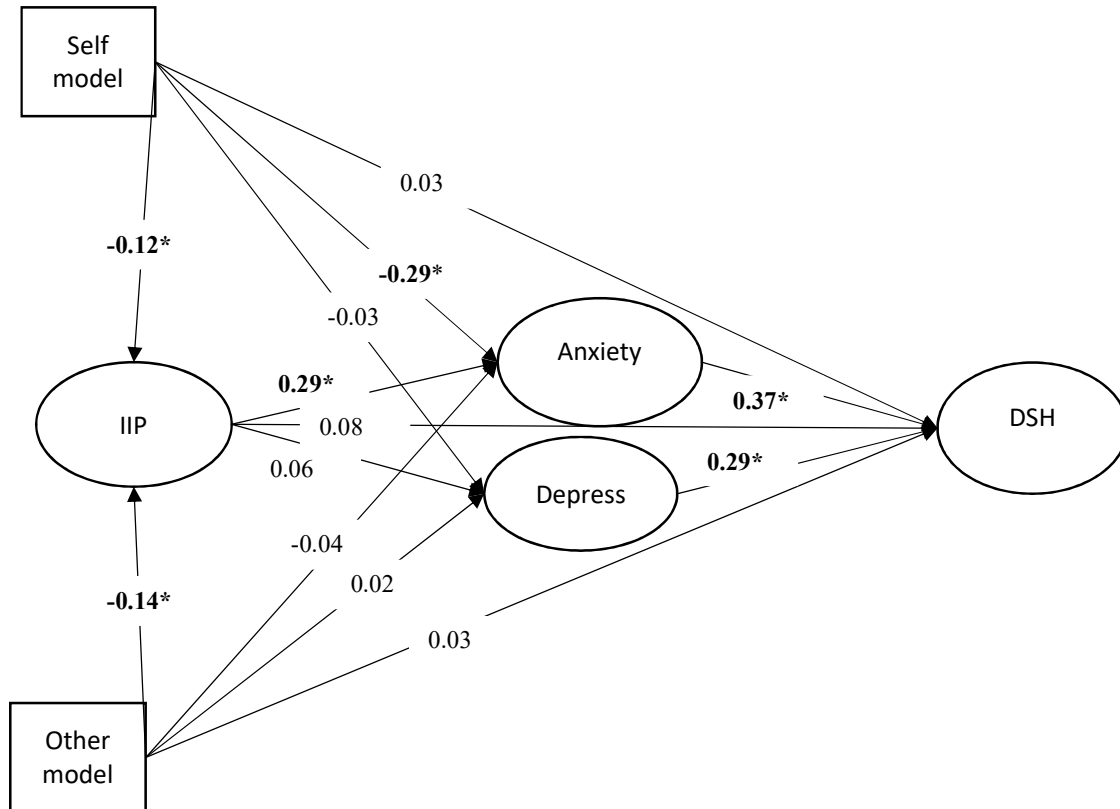
Based on the theoretical assumptions and the empirical evidence, it was hypothesized that self and other models of attachment will predict DSH, depression, anxiety and interpersonal relationship style problems. Interpersonal relationship style problems, depression and anxiety were hypothesized to predict DSH directly. Interpersonal relationship style problems were also hypothesized to predict DSH through depression and anxiety. Hence like model 1 in previous chapter, a double mediational pathway is hypothesized starting from attachment models mediating through interpersonal relationship style problems leading to further mediation through bifurcated pathways of depression and anxiety predicting DSH.

Hypothesized model

A priori structural equation modelling was conducted on two observed predictors (self and other models of attachment) and three latent predictors (depression, anxiety and interpersonal relationship style problems) to predict one latent outcome (DSH) with 80 free parameters. The initial model had good fit (mean $\chi^2 = 502.67$, $df = 194$; mean $CFI = 0.91$; mean $RMSEA = 0.04$) but there were many insignificant pathways as shown in the following figure.

Figure 6.3

Diagrammatic presentation of hypothesized SEM model 3 for association of attachment, interpersonal relationship style problems, depression and anxiety with DSH (N=1290).



Note: $*=p < 0.5$; IIP= Interpersonal relationship style problems; Depress= depression; DSH= deliberate self-harm. Standardized coefficient values presented

Model Modifications

Changes were made in the model with respect to removing one insignificant hypothesized relationship at a time. It could be seen from the significance value of the pathways that attachment did not significantly influence the outcome variable directly.

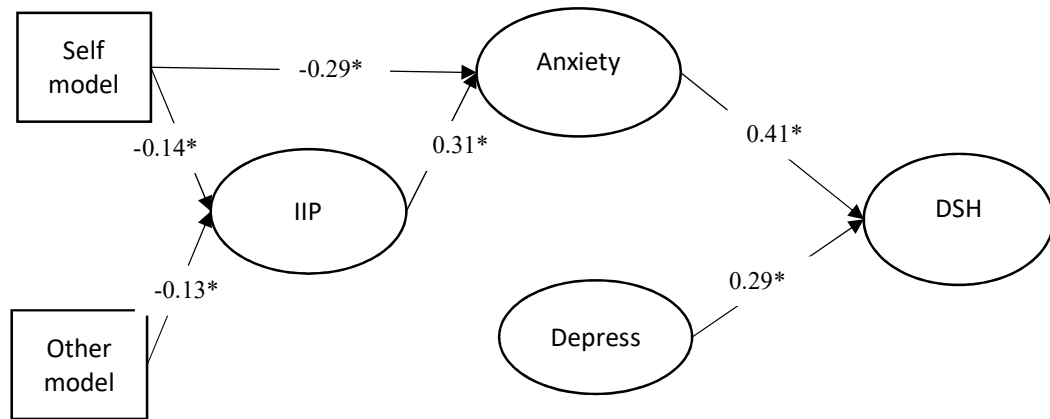
It also did not influence all predictors in a similar way. Therefore, insignificant pathways leading from attachment to the outcome variable and mediating variables were deleted. Similarly, insignificant pathways from interpersonal relationship styles leading to DSH and depression were removed. As a result of these changes a model with only significant pathways emerged. Details of the significant pathways are presented in the following section on final model.

Final model

The final model had three latent predictors, two observed predictors, one outcome variable and 73 free parameters. The model fit is good with 494.92 mean χ^2 ($df = 201$), 0.03 mean *RMSEA* and 0.91 mean *CFI*. The significant pathways obtained in final model are presented in the following diagram.

Figure 6. 4

Diagrammatic presentation of significant pathways in final SEM model 3 for association of attachment, interpersonal relationship style problems, depression and anxiety with DSH (N=1290).



Note: *= $p < 0.05$; IIP= Interpersonal relationship style problems; Depress= depression; DSH= deliberate self-harm. Standardized coefficient values presented

In the final model, two indirect pathways emerged for association of attachment with DSH. Similar to model 1, self model of attachment predicted anxiety (-0.29, $p=0.000$) which in turn predicted DSH (0.41, $p=0.000$). In second pathway from attachment to DSH, decrease in self model (-0.14, $p=0.000$) and other model (-0.14, $p=0.000$) led to increased interpersonal relationship style problems which predicted increase in anxiety (0.31, $p=0.000$) and increased anxiety finally led to DSH (0.41). Depression directly predicted DSH (0.29, $p=0.000$) however, it was not significantly predicted by attachment and interpersonal relationship style problems.

MODEL 4: CONTEXTUALIZING THE RELATIONSHIP OF ATTACHMENT, INTERPERSONAL RELATIONSHIP STYLES, DEPRESSION, ANXIETY AND DSH THROUGH CONTROLLING FOR AGE, GENDER, FAMILY AFFLUENCE AND NEGATIVE LIFE EVENTS.

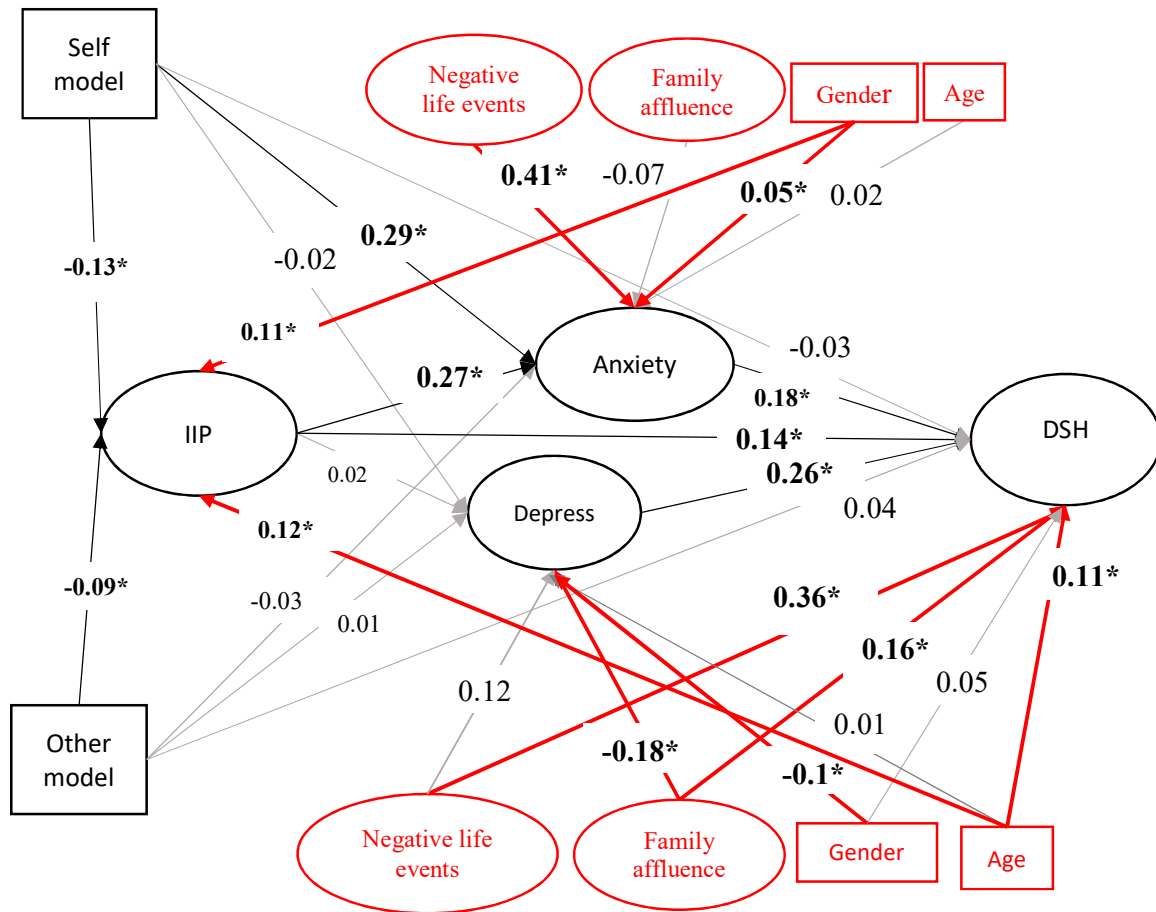
For this fourth model, in addition to the inclusion of the pathways hypothesized for model 3, new pathways were added involving age, gender, family affluence and negative life events. Similar to model 2 in the preceding chapter, all four contextual variables were hypothesized to predict DSH directly and through depression and anxiety. Apart from this, age and gender were hypothesized to predict DSH through interpersonal relationship style problems.

Hypothesized model

A priori structural equation modelling was conducted with five observed predictors (self and other models of attachment, age, gender and interpersonal relationship style problems) and four latent predictors (depression, anxiety, negative life events and family affluence) to predict one latent outcome (DSH) with 160 free parameters. The resultant model estimates showed poor quality of the model (1348.35 mean χ^2 ($df = 910$), mean $RMSEA = 0.02$ and mean $CFI = 0.78$). Following is the diagrammatic presentation of the hypothesized model with standardized individual pathway estimates.

Figure 6. 5

Diagrammatic presentation of initial SEM model 4 for association of attachment, interpersonal relationship style problems, depression and anxiety, with DSH while controlling for age, gender, family affluence and negative life event (N=1290).



Note: $*= p < 0.05$; IIP= Interpersonal relationship style problems; Depress= depression; DSH= deliberate self-harm. Standardized coefficient values presented. Grey colored arrows indicate insignificant pathway. Red arrows indicate significant pathways originating from contextual variables and black arrows indicate significant pathways involving intrapersonal and interpersonal predictors of DSH.

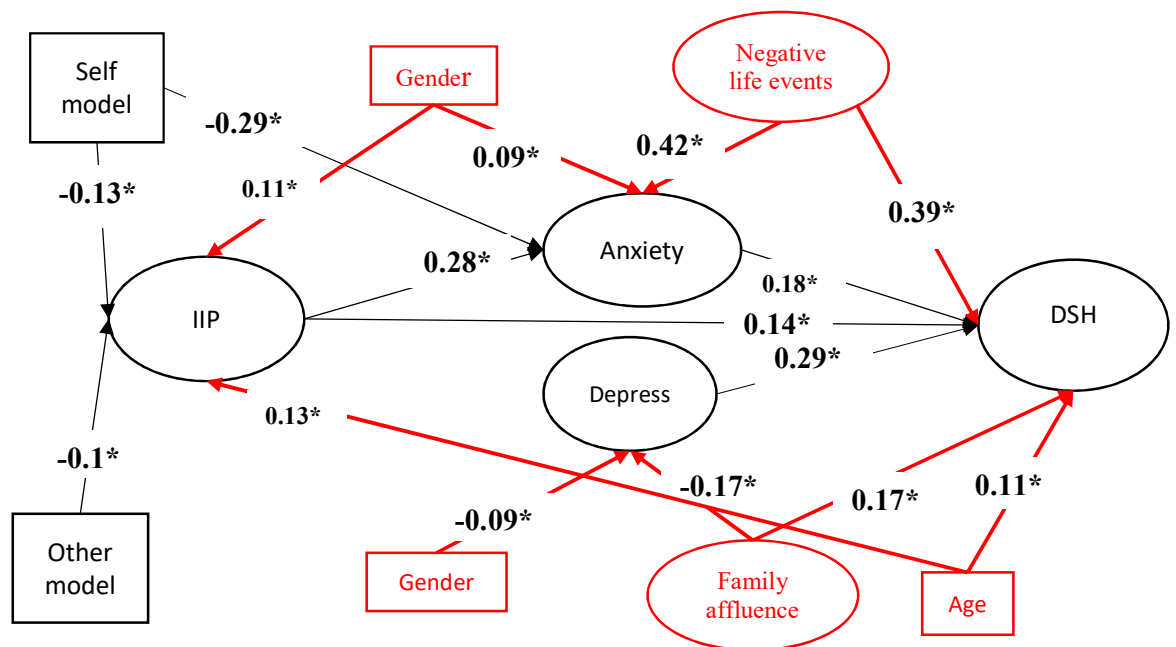
Model Modifications

Since there were many insignificant pathways and unsatisfactory model estimates, modifications were made in the model based on theoretical propositions,

pathways observed in model 1 and 2 (from preceding chapter) and modification indices. As a first step all the insignificant pathways were removed from the model. The resultant model (presented in the following figure) still had unsatisfactory fit (1354.57 mean $\chi^2 =$, $df = 921$; mean $CFI = 0.79$; mean $RMSEA = 0.02$) with 149 free parameters.

Figure 6. 6

Diagrammatic presentation of intermediate SEM Model 4 for association of attachment, interpersonal relationship style problems, depression and anxiety, with DSH while controlling for age, gender, family affluence and negative life event (N=1290).



Note: * = $p < 0.05$; IIP = Interpersonal relationship style problems; Depress = depression; DSH = deliberate self-harm. Standardized coefficient values presented. Red arrows indicate significant pathways originating from contextual variables and black arrows indicate significant pathways involving intrapersonal and interpersonal predictors of DSH.

After removal of all insignificant pathways no theory based or modification indices based suggestions were available for model modifications. However, as in model 2 (presented in preceding chapter) removal of the negative life events from

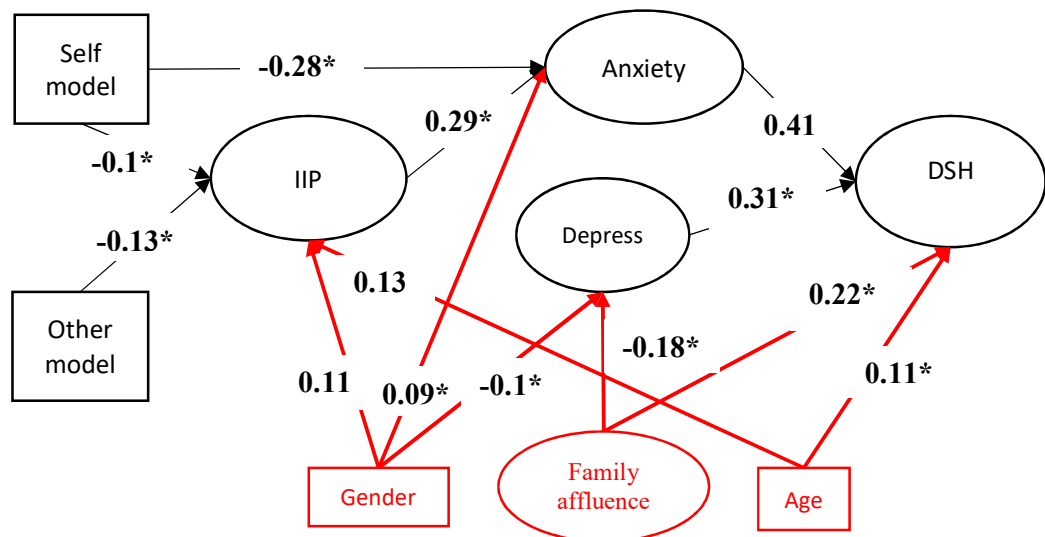
model improved the model fit, the fit of this model 4 was also tested with exclusion of negative life events. With the removal of negative life events from the model, the model fit improved to the satisfactory level (mean $\chi^2 = 644.15$, $df = 330$; mean $CFI = 0.92$; mean $RMSEA = 0.03$) but the pathway leading from interpersonal relationship style problems to DSH also became insignificant (0.09 , $p = 0.06$) and was removed from the model.

Final model

The final model has four latent predictors, and four observed predictors and 93 free parameters. The model had good fit (mean $\chi^2 = 647.88$, $df = 331$; mean $CFI = 0.92$; mean $RMSEA = 0.03$) and is diagrammatically presented in the following figure.

Figure 6. 7

Diagrammatic presentation of initial SEM model for association of attachment, interpersonal relationship style problems, depression and anxiety, with DSH while controlling for age, gender and family affluence (N=1290).



Note: *= $p < 0.05$; IIP= Interpersonal relationship style problems; Depress= depression; DSH= deliberate self-harm. Standardized coefficient values presented. Red arrows indicate significant pathways originating from contextual variables and black arrows indicate significant pathways involving intrapersonal and interpersonal predictors of DSH.

In addition to the replication of the significant pathways involving personal and intrapersonal predictors of DSH that emerged in model 3, significant pathways involving age, gender, family affluence, interpersonal relationship style problems and DSH also appeared. Gender was indirectly associated with DSH through problematic interpersonal relationship styles (0.12, $p= 0.000$) leading to anxiety and finally DSH. Age directly predicted DSH (0.12, $p= 0.02$). The influence of age was also partially mediated through problematic interpersonal relationship styles (0.15, $p=0.000$) leading to anxiety and then DSH. Finally family affluence directly predicted DSH (0.22, $p= 0.000$).

DISCUSSION

In this chapter, the interaction of attachment, interpersonal relationship styles, depression and anxiety as predictors of DSH is presented. There were significant bivariate correlations of self and other models of attachment, overall interpersonal relationship style problems and its subscales, depression, and anxiety with DSH. Both self and other models of attachment were also significantly associated with anxiety and interpersonal relationship style problems and its most subscales. Only other model was not significantly associated with depression, over nurturant and intrusive. Age, gender, family affluence and negative life events, all showed significant bivariate correlations with DSH and its various predictors.

For SEM, attachment was considered as a corner stone in understanding the interaction of interpersonal relationship styles, depression and anxiety (similar to the preceding chapter). Results of SEM analyses showed that interpersonal relationship style problems were considered as mediating factor that were influenced by working models of attachment and in turn influenced anxiety which then led to DSH. Depression acted as a moderator. In SEM analyses, contextualization of the model 3 resulted in emergence of significant pathways from age and gender to interpersonal relationship style problems. Age and family affluence predicted DSH directly. These results are discussed in this section which is further divided into 2 subsections. Subsection A discusses results of SEM model 3 whereas, subsection B focuses on results of SEM model 4.

A. MODEL 3: ATTACHMENT AND DSH: MEDITATING ROLE OF INTERPERSONAL RELATIONSHIP STYLE PROBLEMS, DEPRESSION AND ANXIETY

In model 3 two mediational significant pathways emerged; (1) self model → anxiety → DSH and (2) other model → interpersonal relationship style problems → anxiety → DSH. One direct pathway from depression to DSH was also observed. Influence of self model on anxiety is in line with the existing literature (Simonelli, Ray, & Pincus, 2004). Similarly, the direct association of anxiety and depression is also in agreement with exiting studies (Pollard & Lee, 2003; McMahon, Reulbach, Corcoran, Keeley, Perry & Arensman, 2010; Hawton, Rodham, Evans & Weatherall, 2002; O'Connor, Rasmussen & Hawton, 2009). These two results are already discussed in detail in preceding chapter therefore, the discussion in this chapter will focus on the pathway of double mediation of interpersonal relationship styles and anxiety.

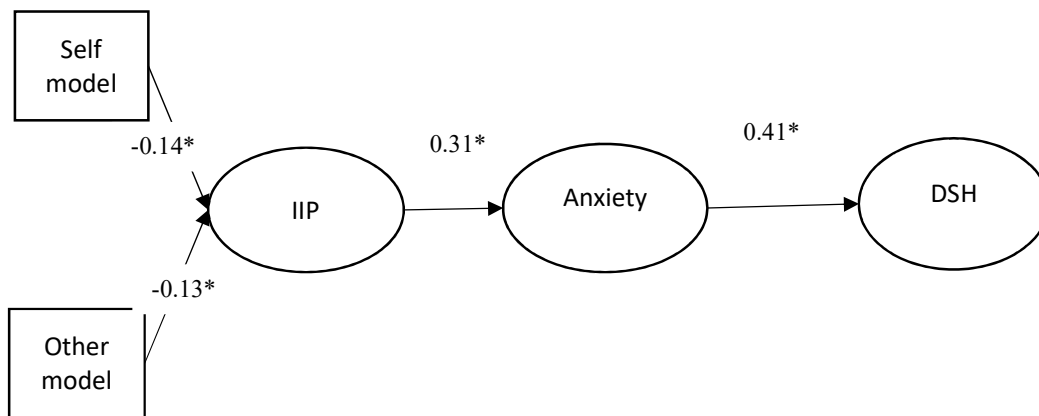
Association of Attachment and DSH: Mediating Role of Interpersonal Relationship Style problems and Anxiety

The bivariate correlations suggested that overall interpersonal relationship style problems and its subtypes were all significantly associated with increased DSH. An elaborated picture of association of overall interpersonal relationship style problems emerged in SEM analysis. In SEM model 3, the association of attachment with DSH was double mediated through interpersonal relationship style problems and anxiety, as shown in the following diagram. In this section the predictive role of

attachment and interpersonal relationship styles will be discussed in light of the theoretical and empirical literature.

Figure 6. 8

SEM model 3 mediational pathway for association of attachment, interpersonal relationship style problems and anxiety, with DSH (N=1290).



Note: * = $p < 0.05$; IIP= Interpersonal relationship problems; DSH= deliberate self-harm
Standardized coefficient values presented.

In the preceding figure both self and other model of attachment effected interpersonal relationship style problems which is in agreement with Horowitz, Rosenberg and Bartholomew (1993) conclusions that individuals with insecure attachment styles show more interpersonal problems. Results of the present study propagate that cognitions about others and one's connection with them play a significant role in the development of interpersonal relationship style problems (Reis, Collins, & Berscheid, 2000; Bifulco & Thomas, 2013; Andersen & Chen, 2002; Baldwin, 1992). The effect of both models of attachment on interpersonal problems can be explained in terms of conceptualization and operationalization of interpersonal

relationship style problems. Self model is more closely related to intrapersonal domain and other model overlaps both interpersonal and intrapersonal domains. Interpersonal relationship styles can be viewed as a function of how others respond to the self and how self reacts to other's reactions (Andersen & Chen, 2002; Baldwin, 1992). In this study, interpersonal relationship style problems were measured in terms of the problematic styles of interactions in interpersonal situations which by nature are interpersonal but also encompass personal domain. The concept of interpersonal interactional styles and the working models overlap with each other in terms of incorporating both intrapersonal and interpersonal domains.

The mediating role of interpersonal relationship style problems in association of attachment with DSH is similar to the study conducted by Stepp, Morse, Yaggi, Reynolds, Reed and Pilkonis (2008). The present study also contributes significant information to the existing evidence in terms of the role of another mediating factor, that is anxiety, in the pathway of interpersonal relationship style problems and DSH. The positive link between DSH and interpersonal relationship style problems through anxiety indicates that problems in interpersonal domains make adolescents anxious. In order to get a relief from this state they deliberately harm themselves. These findings are consistent with theory of interpersonal relations which states that individuals interact with one another in an effort to achieve and maintain balance and to avoid anxiety (Leary, 1957). The maladaptive styles of interpersonal interaction can lead to anxiety. The findings of the present study provide empirical support for the postulate of interpersonal theory which asserts that interpersonal styles of interaction have an effect on mental states (Kiesler, 1983). Hence, when problems in interpersonal domain occur they lead to anxiety and DSH.

B. MODEL 4: CONTEXTUALIZING THE RELATIONSHIP OF ATTACHMENT, INTERPERSONAL RELATIONSHIP STYLE PROBLEMS, DEPRESSION, ANXIETY AND DSH THROUGH CONTROLLING FOR AGE, GENDER, FAMILY AFFLUENCE AND NEGATIVE LIFE EVENTS.

Model 4 was analyzed to understand the interaction of contextual variables with interpersonal and intrapersonal predictors of DSH. Gender, age and family affluence were found to be significant contextual contributors. Age was associated with DSH directly and indirectly through interpersonal relationship style problems. Family affluence influenced DSH directly and through depression. Association of gender with DSH was mediated through interpersonal relationship style problems as well as depression and anxiety. The influences of age on DSH, gender on anxiety and depression, and family affluence on depression was also found in model 2 (in the preceding chapter). The similarity in the significant pathways in model 4 with model 2 strengthen the findings of this research. Since, the associations of gender with depression and anxiety have already been discussed in the preceding chapter the discussion presented in this chapter will focus on association of age and gender with DSH through interpersonal relationship style problems and anxiety, and direct association of family affluence with DSH.

Influence of Age and Gender on Interpersonal Relationship Style Problems Leading to Anxiety and DSH

The mediation of interpersonal relationship style problems and anxiety in association of age with DSH is grounded in the developmental stages that adolescents go through. As adolescents grow, they increasingly tend to become independent from parents and give more importance to people other than family such as peers. These changes in interpersonal relationships can consequently increase the risk of the onset of anxiety among adolescents (Ingles, Hidalgo, & Mendez, 2005).

In the present study, gender also proved to be a significant contextual factor. According to Hawton and Harriss (2008) gender differences are indicative of important developmental differences between females and males, such as earlier onset of puberty in females, which is accompanied by an increase in vulnerability to mood disorders (Coleman & Schofield, 2007) and problems in interpersonal relationships with family and peers (Hawton, Hall, Simkin, Bale, Bond, Cood, & Stewart, 2003). The link hinted by Hawton and Harriss (2008) between gender, mood disorders, interpersonal problems and DSH is confirmed in the present study.

The findings related to gender are also supported by Straiton, Roen, and Hjelmeland (2012) study which considered gender differences in the actual act of DSH and suicidal ideation to be grounded in conventional gender roles. This study explored whether positive (i.e., communion: loves children, grateful, sensitive to the needs of others and devotes self to others) and negative (i.e., insecurity: carefree (negative loading), worried, nervous, emotional, needs approval, self-critical and weak)

conventional gender roles are predictive of suicidal ideation and DSH in 493 (314 females) respondents (mean age= 24.83 years). Straiton, Roen, and Hjelmeland (2012) concluded in regression analysis that insecurity had higher odds of performing DSH and recent suicidal ideation. Communion (a positive gender role which stresses importance of performing in interpersonal relationships domain) was unrelated until this caused anxiety and over dependence on others. Straiton, Roen, and Hjelmeland (2012) explanations for gender differences are related to Pakistani context as in Pakistan females are advised to establish, maintain and express intimacy in their close relationships more than males which can be overwhelming. Thus, the mediating role of interpersonal relationship style problems and anxiety suggested by Straiton, Roen, and Hjelmeland (2012) study is confirmed in the present work.

Association of Family Affluence with DSH

The association of family affluence with DSH is in agreement with studies conducted by Hilt, Cha and Nolen-Hoeksema (2008), Sivasankari. Shaiju, Rahman (2013), and Mars and colleagues' (2014) studies which concluded that lower socio economic status is associated with DSH. However, these findings are in contrast to Young, van Beinum, Sweeting and West (2007) study which established that no significant association existed between DSH and socioeconomic status among 18 - 29 years old individuals in Scotland ($N = 1258$).

Among the probable reasons of the significant role of family affluence in DSH could be that adolescents belonging to families with low affluence experience unhealthy levels of stress and engage more often in harmful behaviors (Pampel,

Krueger, & Denney 2010). In order to explain the role of socioeconomic status in harmful behaviors, Pampel, Krueger and Denney (2010) used stress paradigm and conceptualized socioeconomically disadvantaged position as adversity generating and capacity draining. As economically deprived individuals face multiple chronic stressors in their daily lives, have limited prospects to alleviate this stress and little knowledge of the risks associated with unhealthy behaviors, they often engage in self-destructive behaviors (like DSH in the present study) as operational means to express and/ or fulfil needs. Hence, family affluence can prove to be an important contextual predictor for understanding DSH among Pakistani school going adolescents.

COMPARISON OF MODEL 3 WITH MODEL 4

In the present study when model 3 (interaction of attachment, interpersonal relationship style problems, depression and anxiety to predict DSH) is compared with model 4 (inclusion of contextual effects in predicting DSH) it can be seen that all the contextual variables added little to the model 4, except for family affluence. Family affluence had stronger association with DSH than other contextual predictors. Thus, overall these models support the fundamental universality in the role of attachment, interpersonal relationship style problems, depression and anxiety for predicting DSH among Pakistani adolescents. However, as it was concluded in the preceding chapter the role of contextual factors as predisposing conditions to DSH and its risk factors must not be undermined as they contributed significantly to the model 4.

SUGGESTIONS AND LIMITATIONS

The present study contributed significant information for community based programs and clinical practice guidelines. The findings of the study suggest that attachment forms secure operational base for interpersonal relationship style. These findings have implications for counseling of school going adolescents. The influential role of interpersonal factors in mental health of Pakistani adolescents emphasizes the importance of inclusion of interpersonal style domains in assessments and interventions for adolescents. The present study also stresses that the context and demographic characteristics must be given importance with respect to interpersonal relationship style problems. Age, gender and family affluence need to be considered while designing programs targeting mental health among Pakistani school going adolescents.

In the present study, negative life events were excluded from the model despite their significant contribution. Negative life events have been identified as important predictors in attachment theory and research (Bifulco & Thomas, 2013). Future research endeavors must include negative life events to understand their contribution as predictor of DSH. Finally, some of the findings of this study are preliminary in nature and more research is needed to provide conclusive evidence and to expand the existing findings. For instance, the types of interpersonal relationship style problems can be explored in detail in relation to DSH and its other predictors. Lastly, the conducted research focused on the factors in which the individual him/herself has been instrumental. It will be useful to consider the influence of external factors such as, factors construed by others. For example, the influence of attachment style of the other

person on an individual's development. Interpersonal theory posits that two interacting individuals formulate a guide for each other's behaviors as they interact (Horowitz, Rosenberg, & Bartholomew, 1993). The steps involved in development of this interactional system involving multiple stake holders can be explored in future research.

CONCLUSION

From the models presented in this chapter it can be deduced that attachment is general vulnerability factor that influences interpersonal relationship style problems, depression, anxiety and DSH but similar to model 1 and 2 it exerts differential influence on different predictors of DSH. The findings discussed in this section and the preceding chapter strengthen the propositions of attachment theory that attachment influence both; (A) an expectation about others' behaviors and support (i.e., social support) (model 1 and 2) and (B) the style of interaction. Therefore, attachment theory provided useful framework for understanding DSH. The relatively stronger association of family affluence with DSH shows that lower family affluence must be given attention while looking at vulnerability factors of DSH.

CHAPTER 7

CONCLUSION

The present study explored interpersonal and intrapersonal factors associated with DSH among Pakistani school going adolescents, through standardized psychological instruments translated into Urdu language. Results were interpreted in the context of attachment theory and existing research. The findings of the present study not only fit within the proposed theoretical framework but also adds to it by identifying several novel pathways. All the SEM models asserted the important role of attachment as a corner stone that influenced DSH indirectly through interpersonal and intrapersonal predictors. The pathways of interaction of interpersonal and intrapersonal predictors became evident in the current study. Interpersonal predictors influenced DSH through inducing negative effective states. Another notable distinction of the study is that DSH was successfully tested as a continuous phenomenon rather than simple presence or absence of behavior (categorical approach) which has implications for prevention and intervention programs. The SEM explorations were also grounded into Pakistani context. Adopting such an approach helped to unpick similarities with other regions as well as identify components specific to Pakistani context.

LIMITATIONS

Following are the limitations of the present study:

1. Future research endeavours must include measurement of social disability. This is of importance as adolescence is the time period when social acceptance and identity formation are important concerns. It is also of significance because the survey was administered in classroom settings where seats were closely placed by the school administration.
4. As convenient sampling was used in this study, the sample may not be representative of the population. Moreover, the data was collected from schools only. This was done because of the limited time frame and low cost of collecting data from schools. Future explorations may include a community based approach where all the households in particular area are included in the study which will allow to collect data from those adolescents who are not enrolled in school.
5. The age range specified for the sample was 10 - 19 years however, in order to avoid having to manage large number of adolescents ineligible to participate in the study adolescents were recruited from grade 6th to 10th (for all schools) and 11th (for one school only in the pilot phase). As only few adolescents were in their late adolescence till grade 10th and 11th the results are more representative for early and middle adolescence group.
6. Furthermore, due to smaller sample size and sampling techniques prevalence rates for adolescent population could not be estimated in this study and there is still need to estimate prevalence rates of DSH in Pakistan.

7. Keeping in view the fact that it is a cross-sectional study and the directional pathways of SEM models are theoretically formulated, for true causal paths longitudinal studies are required.
8. In the present study, data was collected from 23rd January to 24th February 2012. In Pakistan, this is the time of the year when most of the course work is completed and students are preparing for the exams which are held between March and April. In most of the schools, students were revising their course work and were having practice assessments. Research has indicated that academic assessment is associated with experience of increased anxiousness and depressive symptoms (Conley & Lehman, 2012). It is possible that due to the time of measurement adolescents might have expressed anxiousness and depressive symptoms to a slightly elevated extent but as the data was collected one to two months before exam these symptoms cannot be considered as highly influenced by exams.
9. The refusal rate was high in this study in general, but more reluctance was faced in case of girls-only schools. One girls only school ($N = 128$) withdrew their consent to participate in the study during survey administration; stating that they withdrew their consent as they believed that any problem related to the questions asked in the survey did not exist in their school and therefore, the questions are too sensitive to be asked to the students. One probable explanation for this could be that in Pakistan, the concept of honor is more related to female gender than male gender. Females are not only responsible for their own honor but they are also responsible for the honor of their family. According to Lari (2011) this concept is so widely held in the society that the behaviors of females

are not only monitored by their own family but also judged more strictly by the society in general. Similar gender related differences were also stated by Mustaqeem (2009). The present study did not include a separate analysis of the information provided from the school which withdrew its consent and the respondents with missing values on the outcome variables. For future endeavors it will be edifying to explore the patterns of responses on such cases and compare it with other cases that provided response.

10. In the present study, only self and other models of attachment were included in SEM as they were considered blue prints for development of attachment by Bowlby (Berry, Danquah, & Wallin, 2014). Attachment styles were not included in SEM and factor analysis because of the two reasons; firstly the focus of the study was to find the role of self and other models and the reliabilities of the subscales of adolescent relationship scales were quite low. Considering the low reliabilities of the scale the factor structure of attachment styles needs to be explored in future studies. In other existing studies, the adult version of this scale has been known to deviate from its originally proposed four factor structure (Bartholomew & Horowitz, 1991) to three factor structure (dependence, closeness and anxiety) (Collins & Read, 1990). Hence for future endeavors, it would be interesting to explore how self and other models of attachment get translated into different attachment styles. However, previous attempts have proved that due to the interdependency of the two models and the way these two models are calculated (i.e., inclusion of all items in calculating each model, as stated in the method chapter), this task is very difficult to pursue. Perhaps a different method of exploration or analysis may

be used to pursue this task in future.

11. The present study explored only influence of perceived actual social support. Existing literature has indicated that discrepancy score has additive value (Cho, Zunin, Chao, Heiby, & McKoy, 2012) therefore, it can be used as additional useful indicator for predicting DSH in forthcoming studies.
12. The present study established the importance of four interpersonal and intrapersonal predictors of DSH only. There are other predictors of DSH that also play a significant role. For instance, a study conducted by Nielsen, Sayal and Townsend (2017) shows that coping act as an important predictor for DSH while controlling for depression and anxiety. In fact, DSH has been used as a coping mechanism where there was lack of coping self-efficacy (Heath, Joly, & Carsley, 2016). Among other predictors identified in literature impulsivity is also closely linked with DSH. The need to explore the role of impulsivity was pointed out in the factor analysis of construct of DSH when an item pertaining to planning had to be excluded from the model. Literature has indicated presence of both low and high planned DSH (Smith, Witte, Teale, King, Bender, & Joiner, 2008; Gvion & Apter, 2012, Connor, 2004). As mentioned earlier in discussion on factor analysis of DSH, it will be useful to look into the predictors like impulsivity with respect to planning for DSH.
13. Lastly, in accordance with attachment theory, negative life events had significant contribution in the model however, due to poor performance indices of the SEM models they had to be excluded. In future studies it will be useful to include negative life events and study the influence of individual negative life events on relationship of attachment and DSH. Similarly, studying the role

of individual interpersonal relationship style problems will also help to clarify the state of knowledge generated in this study on role of interpersonal relationship styles in Pakistani adolescent population.

Despite these limitations, this study has important implication which will be discussed now.

IMPLICATIONS

This study furthers the understanding of adolescent development which aids in bridging the gap in knowledge that currently exists in Pakistan. This study not only addresses the extreme scarcity of knowledge on DSH in Pakistan but it also potentially benefits Pakistani adolescent immigrants living in other regions of the world. The refinements and extension in state of the knowledge offered by the results of the present study can be used for conducting further research, theory development, curriculum development, teaching, clinical practice, designing and adaptation of awareness programs and interventions for school and community settings, developing policy guidelines for adolescents and immigrant population. These implications are discussed in detail in the following sections.

Theoretical implications

Several theoretical implications emerged in the present study. The study provided framework to understand DSH from attachment perspective. Results emphasized the need to add more detailed pathways to attachment theory which lead from specific risk factors to specific outcomes. A general pattern of interaction can be

deduced based on the results of the study (attachment → interpersonal factors→ intrapersonal factors→ DSH). In accordance with attachment theory, results of the study propagate that intrapersonal issues are embedded within interpersonal concerns. Context had minimal effect on interaction of predictive factors. The present study has confirmed universal elements of DSH and its predictors as well as highlighted relevant context specific factors. Hence, it provides information for adapting and adding to the attachment theory. The framework used in this study can be utilized as a productive framework to promote further research.

Methodological implications

This study is especially significant in establishing feasibility of studying highly sensitive issues like DSH in Pakistan. Based on the experience of conducting this study it is recommended that field contacts or personal references must be used while exploring sensitive issues in Pakistan, as Pakistan is a country where personal references are considered important both in personal and occupational contexts. This study has shown that use of such strategies not only ensure credibility of the researcher but also ensure safety for both researcher and participants.

There is dearth of availability of well translated instruments to be used with both ingenious Pakistani population and immigrants living in other countries. The translated instruments used in this study can be used for further research. As the study encompassed wide range of predictor variables, it has translated and utilized several instruments that were not previously available in Urdu language due to which internationally comparable research could not be conducted with these instruments.

Thus, this study has established long term capacity for further research in terms of establishing reservoir of tools on wide range of topics encompassing both interpersonal and intrapersonal domains.

In this thesis, several of the instruments exhibited variant factor structure than existing research. These results implied that this variation must be considered while using these instruments in future. This is also indicative of considering context specific variations in conducting any research in indigenous settings.

School and community based implications

The results of this study provide evidence for developing school and community based prevention, intervention and awareness programs. In light of the findings of the study it is suggested that the school curriculum must include information about issues, such as DSH and interpersonal relationship problems. Including this information in curriculum has a special advantage since education is aimed at improving scholastic abilities as well as equipping students with better life skills and helping them to get ready for adult life (Organization for Economic Co-operation and Development [OECD], 2015). This can be incorporated in the form of regular course content by replacing or modify stories or lessons included in the course and activities designed for the students. This will also reduce the burden on the overburdened health care system of Pakistan. An example of such an approach can be seen in the steps taken by the Scottish Government in the form of developing curriculum for excellence incorporating skills for learning, skills for life and skills for work (Scottish Government, Edinburgh, 2009).

Despite the fact that phenomena studied in this research have components specific to Pakistani context, there are many similarities with the Western societies. It suggests that already available programs developed for Western settings can be adapted to the needs of Pakistani society. For instance, an approach similar to “curriculum for excellence building the curriculum 4 skills for learning, skills for life and skills for work” (Scottish Government, Edinburgh, 2009) can be adopted after context specific changes (such as in relation to age, gender and socioeconomic status). Through such programs adolescents can be equipped with proactive skills to deal with stress such as relying on social support from family and peers.

Other than the adolescents in schools, education must also be provided to the parents, doctors, lawyers and other community members about DSH and its risk factors. In other regions of the world, several programs have been built on the basis of potential strength of families and communities. For instance, a program in neighboring country with similar cultural and social set up, Adolescent Family Life Education Programme by the Bangladesh Rural Advancement Committee, provided family life education to those who were out of school (10 to 15 years of age) (Forman & Gosh, 2000; Faiz, Banu, & Sherma, 1995). In this program meetings were held with parents, teachers and community leaders so as to inform or sensitize them about adolescent mental health and their developmental needs. The present study dictates that to target DSH the focus of such programs should be on social support, interpersonal relationship style problems, negative emotional states and attachment.

Clinical implications

With respect to clinical practice several intervention points are suggested for therapeutic purposes. Taking the example of depression and anxiety, it is suggested that when dealing with these issues a possibility of DSH should also be explored and preventive techniques should be employed to prevent depression and anxiety from leading to DSH. More importantly this study suggests that the focus of intervention should be on interpersonal factors in obliterating mental health concerns. For instance, results showed that social support from family and friends acted as important protective factor for adolescents. Hence, it is suggested that family based interventions can be used with adolescents to deal with DSH and other issues. Furthermore, while dealing with mental health issues interpersonal concerns should be given equal importance as they have been found to be responsible for mental health issues in the present study.

Guidelines for health care planners and policy makers

This study also indicates that it is high time for the health care planners and policy makers to give importance to adolescent mental health at a practical level, as a vital part of complete health care. Policy guidelines should increase focus on mental health issues, especially depression and anxiety must be focused on as a very high rate of depression and anxiety was reported in the present study.

Future research

Finally, some of the findings of this study are preliminary in nature and more research is needed to provide conclusive evidence, and to refine and expand on the existing findings. Role of negative life events, specific interpersonal relationship problems, continuum approach for understanding and measuring DSH and discrepancy in social support, are among the several directions for future research provided by this study.

The exploration of the wide range of interpersonal and intrapersonal risk and protective factors of DSH make present study unique in its effort to provide a framework for developing future research projects and review of theoretical conceptualizations. The findings are suggestive of the remedies that are cost effective for resource constraint settings of Pakistan and are much needed in the current socio-political environment to protect and develop adolescents as a human resource.

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APPENDICES

Appendix 1

1. Approval letter from Ethics committee of Fatima Jinnah Women University
Rawalpindi Pakistan
2. Approval letter from Ethics committee of University of Edinburgh, Scotland
3. Approval letter from Directorate of Education

Approval letters

Fatima Jinnah Women University

THE MALL, RAWALPINDI

Tel: 051-9271167 Fax: 92-51-9271168. E-mail: registrar@fjwu.edu.pk

Ref: FJWU/Reg/2012/9044

Dated: January 24, 2012

Ms. Sabahat Haqqani
FJWU HRD Scholar/Lecturer, Behavioral Sciences Department

| | |
|---|---|
| Ethics Reference No: <i>Please quote this ref on all correspondence</i> | FJWU/Ethics/2012/02 |
| Project Title: | “Comparison of Mental Well Being Health Risk Behaviours and Associated Factors in Pakistani & Scottish Adolescents” |
| Researcher’s Name(s): | Ms. Sabahat Haqqani |

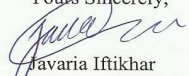
Thank you for submitting your application which was considered by the FJWU Ethics Committee. The following documents were reviewed:

1. Ethical Application Form
2. Participant Information Sheet
3. Consent Form
4. Letters to Parents/Children/Principals etc.
5. Questionnaires

The FJWU Ethics Committee approves this study from an ethical point of view. This approval is subject to the condition that any serious adverse events or significant change which occurs in connection with this study and/or which may alter its ethical consideration must be reported immediately to the FJWU Ethics Committee, and an Ethical Amendment Form submitted where appropriate.

You must inform FJWU Ethics Committee when the research has been completed. Please note that approval is only given for the data collection in Pakistan. Independent ethical approval from University of Edinburgh will be required for data collection in UK.

Yours Sincerely,



Javaria Iftikhar
Secretary FJWU Ethics Committee



School of Health in Social Science
Medical School, Teviot Place
Edinburgh
EH8 9AG

Telephone: 0131 651 3972
Fax: 0131 651 3971

Dear Sabahat

Re: Comparison of deliberate self harm and its associated factors in Pakistani and Scottish adolescent community population

Many thanks for submitting the above research project for review by the Clinical Psychology Ethics Research Panel. I can confirm that the submission has been independently reviewed and was approved on the 21st November 2011. Should there be any change to the research protocol it is important that you alert us to this as this may necessitate further review.

With best wishes,

Yours sincerely,

pp. Dr. Suzanne O'Rourke
Ethics tutor

RESTD

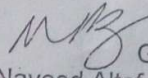
FGEI (C/G) Regional Office,
Westridge- I, Rawalpindi
Tel (Mil): 561 - 34046
F.No.6-37/78-ROR (Coord) 215
15 Dec 2011

To: _____
All Concerned

Info: Dr Farah Qadir, Incharge Behavioral Science
Fatima Jinnah Women University, The Mall, Rwp

Subj: Institutional Support to Fatima Jinnah Women University

Permission is hereby accorded to the research team of Fatima Jinnah Women University, Rwp, to visit your school for the purpose of data collection to measure anxiety, school stress and socialization practices.


Maj
GSO-2
(Naveed Altaf Niazi)

RESTD

Appendix 2

DIFFICULT WORD LIST

مطمئن : آرام سے رہ سکتا ہوں۔

درجہ : نمبر Number

اطمینان سے : آسانی سے۔

میں گھبراتا ہوں/ مجھے پریشانی ہوتی ہے : مجھے فکر ہوتی ہے۔

اوسط : مناسب۔

صلاحیت : طریقہ۔

مرتب کی گئی : دی گئی۔

غیر معروف : گمنام۔

افعال : عمل۔

معاشرتی : سماجی۔

انتقال : فوت ہونا۔

تکلیف : پریشانی۔

Appendix 3

ADMINISTRATION MANUAL FOR RESEARCH ASSISTANTS

Introduction: Introduce yourself in Urdu to the pupil according to the sample introduction given with this document.

This introduction includes:

- Your name
- Who you are working with?
- The name of study
- What it is about.
- Who is conducting the study?
- Who approved the study?

Preparing for administration of the questionnaire:

- Note down the time at which the administration started.
- Ensure that each student has a pen and is comfortably seated.
- Count the total number of present students and number of students who have signed parental consent form.
- Note down the number of students who were given the form but are absent on the day of administration (you can take help from the students to find out how many students who have been given parental consent form are absent).
- Note down the number of students who are present but forgot to get the parental consent form signed from their parents/ guardian.
- Note down separately the number of students were not permitted by their parents/guardian to participate in the study.
- Ask all the students to write down their full names and class on the signed parental consent forms.

Distributing questionnaires:

Give questionnaires only to those students who return the signed consent form with their names and class written on it. In case of administration in the hall with different classes present request each class to stand up while filling in your information sheet.

Instruction for filling in the questionnaire:

- Give instructions to the students in Urdu.
- Ask them to read the first two pages of the booklet given to them and sign on the second page at the two blank spaces provided.
- Tell them that they have to read each question starting from page 3 and answer it either in their own hand writing or have to select one option from the given answers. Request them to encircle the option they choose (preferably). Tell them that there is no right and wrong answer. They will not be marked for it.
- Ask them to read instructions carefully. Especially explain them the instructions of Significant Others Scale the part A and B of each question.
- Ensure anonymity to them and encourage them to select the option they think is true for them. Encourage them to ask questions if they do not understand

anything or if they need help with something such as understanding the meaning of the words. If they ask questions with regard to understanding the meaning of the phrase, word or sentence, read the statement for them slowly at least thrice and then ask them what do they understand from it. If they are not able to tell you what they understand from it ask them what they do not understand. Check for the response in the check list of possible alternates given to you. In case you do not find any response from the checklist and the pupil is not able to tell you what they understand please request to answer according to whatever they think it is about and note down how many times, with how many pupils and for what question item this situation occurred.

Answering respondents queries about the research:

Pupils usually ask two types of questions. These are about the purpose and the benefit of the study.

- If pupils ask about the purpose of this research. Tell them that it will help us understand what people of their age think and feel. It will also help to understand the problems faced by adolescents.
- If you are asked how it will benefit them. Tell them that we are collecting this data to help design interventions for them.
- Also tell them that they are provided with list of professional helping organizations from which they can seek help if needed.

Receiving back the questionnaires:

- Note down the time at which first and last questionnaire was returned.
- When you receive the filled in questionnaire check the sign on adolescent consent form and ask the student if they have completed the questionnaire. Tear off the first page from it and give it back to the student as it contains information for the student.
- In case someone returns the incomplete questionnaire encourage them to complete it. If they still refuse ask them the reason and make a note of it on the incompletely filled returned questionnaire.
- At the end of the administration count the total number of returned questionnaires (complete and incomplete).

Important notes to be followed:

- You will be given a form to fill in the information stated in “preparing for administration of questionnaire” section.
- You are provided with a table of suggested alternate answers to help you with answering the queries of pupil.
- Do not let the student or any school staff member to take copies of the questionnaire with them.
- Keeping reassuring the student about confidentiality and encourage them to ask questions from time to time.
- Do not to let the school staff interfere with the administration. It is your responsibility to keep the students calm and maintain discipline. Encourage each student to fill in the questionnaire independently

- After 1 hour 10 minutes start encouraging student to finish the questionnaire as soon as possible.
- You are also required to make notes of your observation during the administration. These can be regarding the attitude of the school staff and students, the kind of questions staff and students asked, general environment of the school, condition of the school and other related information.
- Also make a note of your experience of survey administration.
- **DO NOT EXCHANGE YOUR PERSONAL CONTACT NUMBER WITH THE RESPONDENTS IN ANY CASE.**

Sample introduction:

میرا نام صباحت حقانی ہے۔ ہم دس سے ۱۹ سال کے بچوں پر ریسرچ کر رہے ہیں۔ اس ریسرچ کا topic ۱۰ سے ۱۹ سال کے بچوں کی metnal well being اور health risk behaviors ہے۔ یہ ریسرچ فاطمہ جناح ویمن یونیورسٹی سے منظور شدہ ہے۔ اس ریسرچ میں حصہ لینے کے لئے آپ کو اپنے والدین سے دستخط شدہ اجازت نامہ پر اپنا پورا نام اور کلاس لکھ کر واپس کرنا ہوگا۔ اس کے بعد ہم آپ کو سوالنامہ دیں گے جس کو آپ نے پُر کرنا ہوگا۔ اس کو سوالنامے کے پہلے اور دوسرے صفحے کو پڑھ کر دوسرے صفحے پر دو جگہ دستخط کرنے ہیں۔ اس کے بعد آپ نے ہر سوال کو پڑھ کر اس کا جواب دیئے ہوئے جوابات میں سے منتخب کرنا ہے۔ جہاں آپ سے خود جواب لکھنے یا وضاحت کرنے کی درخواست کی گئی ہے وہاں خود جواب لکھیں۔ کوئی جواب غلط یا صحیح نہیں ہے۔ صرف وہ جواب چنیں جو آپ سوچتے یا محسوس کرتے ہیں۔ آپ کے تمام جوابات کوراز میں رکھا جائے گا۔ اگر آپ کو کوئی بات سمجھ میں نہ آئے یا آپ نے کسی بات کا مطلب پوچھنا ہو تو ضرور پوچھیں۔

Table of recommended answers

| | |
|---|---|
| سوال نمبر 6: کنوارے کنواری کا مطلب وہ شخص ہوتا ہے جس کی شادی نہ ہوئی ہو رومانوی تعلق affair، کسی کو چاہنا | |
| سوال نمبر 8: واضح کریں یعنی تفصیل بتائیں، اگر ہاں تو آپ کے پاس گھر میں کتنی گاڑیاں یا موٹر سائیکل ہیں | |
| سوال نمبر 7: سرپرست اگر والد نہیں ہیں تو گھر کا وہ بڑا جو کما کما ہے اس کا کام لکھیں | |
| سوال نمبر 12: اگر طاب علم کو سمجھ نہ آئے تو یہ پوچھیں کہ ان کے گھر میں کون کون رہتا ہے اور اس حساب سے سوال سمجھنے میں مدد کریں | |
| سوال نمبر 15: اگر طاب علم کو سمجھ نہ آئے تو دونوں زبانوں کے لئے چاروں خانوں میں الگ الگ نشان لگانے کا کہیں | |
| سوال نمبر 17: joint family خاندان کے دوسرے لوگوں بچا چچی یا تایا تائی کے ساتھ ایک گھر میں رہنا | |
| سوال نمبر 24: girl frined لڑکوں کے لئے ہے اور boy friend لڑکیوں کے لئے ہے | |
| (NOTE: pupil may try to take it non seriously be firm and very serious when you answer such queries) | |
| سوال نمبر 26: دھونس یعنی زور زبردستی، ستانا یا تنگ کرنا | |
| سوال نمبر 38: جنسی کام یعنی آپ کے مرضی کے خلاف آپ کے جسم کو ہاتھ لگانا یا آپ کے ساتھ زیادتی کرنا | |
| اگر اوپر والے سوال (یعنی سوال نمبر 38) کا جواب ہاں ہے تو برائے مہربانی وضاحت کریں | یہاں پر سوال نمبر 38 کی جگہ 39 آئے گا۔ اور اس میں صرف سوال نمبر 39 کی وضاحت کرنی ہے |
| انحصار (depend) کسی پر اپنے کام کے لئے تکیہ کرنا، کسی پر اپنے کام کے لئے بھروسہ کرنا | |
| خود مختار یعنی جو سب کچھ خود کر سکتا ہے | |
| ترجیح بہتر سمجھنا | |
| دستی تباؤ/دباؤ دستی pressure | |

| معالج | ڈاکٹر |
|---|--|
| درپیش | ان کے ساتھ آپ کو پیش آنے والے مسئلے |
| اگر آپ نے ”نہیں“ پر دائرہ لگایا ہے تو آپ اگلے سوال پر جائیں۔ اگر آپ نے ”ہاں“ پر دائرہ لگایا ہے تو برائے مہربانی نیچے دیئے گئے (2ب)، (2ج)، (2د) کو مکمل کریں۔ | اب یہاں سے شروع کریں: ’لوگوں نے دوسرے لوگوں سے میل جول کے متعلق مندرجہ ذیل مسائل کو بیان کیا ہے‘ |
| اگر نشیات، شراب، شیشہ یا چرس والے سوالات میں کوئی یہ پوچھے کہ یہ کیا ہوتا ہے تو اس سے سوال کریں کہ اس کے خیال میں یہ کیا ہے۔ اگر وہ صحیح جواب دے تو کہیں ایسا ہی ہے اگر کہے کہ اسے نہیں معلوم کہ یہ کیا ہے تو اس کہیں کہ معلوم نہیں لکھے یا اگر غلط جواب دے تو اسے کہیں کہ اپنا جواب ہاتھ سے سوال کے ساتھ خود سے لکھ دے | |

Appendix 4

Research Protocol

(English version)

English version of:

1. Cover letter
2. Detailed information sheet for schools/ parents
3. Parental consent form
4. Participant information sheet
5. Participant consent form
6. Questionnaires

Cover letter

Study: Risk taking behaviors and their associated factors in Pakistani adolescent community population

Dear parents/ guardians,

I am a post-graduate student at University of Edinburgh (U.K) conducting a study on feelings and daily life experiences of adolescents. Many young people can face problems at various times and sometimes have difficulty coping with them. The objective of the study is to understand how pupils at school feel and cope with these problems and situations so as to enable a better understanding.

I am inviting your child to participate in the study. The study will be conducted during school hours in classroom setting for 60-70 minutes. Your child's participation in the study may help us develop a better understanding of the subject and any information provided may help developing improved supports. All information collected from students will be anonymous and identified by numbers only so to ensure complete privacy. When publishing the results, the information will be fully anonymous so that no personal identification or identification of the school can be made. In case of identification of a child related issue demanding attention the researcher will only be responsible to inform yourself as a parent through school authorities.

I hope you will take a few minutes to complete the attached form. Please do appreciate that without your help, this research cannot be conducted, and without this research we would not be able to study and eventually protect children from harmful trends

If you agree to let your child participate, please indicate your decision on the parental consent form and enclose it in the provided envelope. This will be collected from the child. You may withdraw your permission at any time with no effect on your or your child's right.

In case you need more detailed information before making your decision a detailed information sheet is also attached. If you have any queries please contact Sabahat Haqqani at Sabahat.haqqani@hotmail.com or Dr Farah Qadir at farah.qadir@fjwu.edu.pk

Yours sincerely,
Sabahat Haqqani
PhD student (clinical psychology)
School of Health in Social Sciences,
University of Edinburgh

Detailed information sheet

Study: Risk taking behaviors and their associated factors in Pakistani adolescent community population

What is the purpose of the study?

This research is being conducted in adolescent community population. It will help to understand better how pupils at school feel and cope. Many pupils at various times can have problems and sometimes have difficulty coping with them. These difficulties may make an individual prone to health risk behaviors (such as physical inactivity, bullying, unhealthy dietary behaviors, tobacco use and behaviors that contribute to unintentional and intentional injuries and violence). In contrast positive experiences (such as social support and strong relationships) can protect from these. The aim of the study is to collect information that will help developing better support and help for people.

Why your child is invited to participate in the study?

All adolescents aged between 11 to 19 years, enrolled in a school are invited to participate in the study.

What does your child has to do to take part in the study?

The study will be explained to the children and any questions they raise will be addressed. After filling in the consent form the child will be asked to complete a series of questionnaires about their feelings and experiences in their day to day life and how they deal with these.

Does your child have to participate in the study?

Any participation is voluntary. Your child has the right to discontinue at any point. Her/his decision to withdraw from the study will have no consequences and will explicitly not affect her/his academic grades, right to obtain services, etc. You and your child will not be contacted further. The incomplete questionnaire returned to the administrator may or may not be used in the analyses based on your child's consent about it.

What is the cost of participation?

There is no cost of participation in the study beyond the time and effort to fill in the questionnaire.

Who approved the study?

The study is reviewed by the University of Edinburgh, School of health in social sciences ethics committee.

What about confidentiality and anonymity?

Your child's responses will be kept confidential and will be anonymised. Any publication of the research will not include any identification of the respondents both at individual and institutional levels. In case of identification child protection issue the researcher will only be responsible to inform the concerned authorities. The researcher is not responsible for any further action required.

What are the advantages or disadvantages of taking part in the study?

There are no personal or academic benefits or drawbacks of participating in the study. This study may cover areas that are sensitive or distressing. If your child will feel any discomfort during the study she/he may choose to discontinue at any time. A list of professional organisations with whom your child can talk will be given to all participants.

Further information:

If you have any queries, please contact Sabahat Haqqani at Sabahat.haqqani@hotmail.com or Dr Farah Qadir at farah.qadir@fjwu.edu.pk

Parental/ Guardian consent form

I confirm that I have read and understood the preceding information sheet. I have been given the opportunity to ask questions.

The permission I granted for my child to participate in the study is voluntary and she/he has the right to withdraw from the study at any time without any of her/his medical care and legal rights being affected.

I understand that the information obtained from the questionnaires will be anonymized and will be used for the purposes of research only.

I permit my child to take part in this study.

Date: _____

PARTICIPANT INFORMATION SHEET

Study: Risk taking behaviors and their associated factors in Pakistani adolescent community population

Researcher: Sabahat Haqqani

My name is Sabahat Haqqani and I am clinical psychology PhD student in University of Edinburgh. You are invited to participate in a research study.

Following is some information to help you decide if you want to take part in the study. Please read the information carefully. If you have any questions about the study, you can ask the researcher or email Sabahat Haqqani at Sabahat.haqqani@hotmail.com or Dr Farah Qadir at farah.qadir@fjwu.edu.pk

What is the purpose of the study?

This research is interested to understand how pupils at school feel and cope. Many pupils experience difficulties or worries from time to time sometimes which they find tricky to deal with. These difficulties may make an individual prone to health risk behaviours (such as physical inactivity, bullying, unhealthy dietary behaviours, tobacco use and behaviours that contribute to unintentional and intentional injuries and violence). In contrast positive experiences (such as social support and strong relationships) can protect from these. The aim of the study is to collect information that will help developing better support and help for people.

Why you are invited to participate in the study?

All adolescents aged between 11 to 19 years, enrolled in school are invited to participate in the study.

What do you have to do to take in the study?

If you decide to take part in the study you are asked to provide a signed parental/ guardian and personal consent form. Next, you will be asked to fill in a series of questions (15-20 minutes) related to your feelings and experience.

Who approval of the study?

The study is approved by ethics Committees of University of Edinburgh School of health in social sciences and Fatima Jinnah Women University Rawalpindi Pakistan.

What about confidentiality and anonymity?

Your responses will be kept strictly confidential and will not include any names or other details about yourself. Any publication of the research will also not include any details of any individual who took part.

What are the advantages or disadvantages of taking part in the study?

There are no personal or academic benefits or drawbacks of participating in the study. You can choose to stop taking part at any point without giving a reason. Your decision to stop

with the study will not affect your school work or the support you get, etc. You will not be contacted any further to participate in the study. The incomplete questionnaire that you will return to the administrator may or may not be used in the analyses based on your decision about it.

This study may cover areas that are sensitive or distressing for you. If you are worried or upset at any point the study you may choose to stop at any time. A list of professional organisations with whom you can talk about your feelings is provided below.

What is the available support?

If you think you need to talk about your feelings and thoughts in relation to the above mentioned research topic, you can contact the following help lines.

Youth help line:

Free phone from majority of landline areas (accessible from mobile as well with regular landline charges): 0800 22444 10am to 8pm daily.

E-mail address is: awaz@rozan.org or yhl@rozan.org

Wide range of awareness, counselling, and referral services.

Participant consent form

I confirm that I have read and understood the preceding information sheet. I have been given the opportunity to ask questions.

My participation in the study is voluntary and I have the right to withdraw from the study at any time during the administration without any of my medical care and legal rights being affected.

I understand that the information obtained from the questionnaires will be anonymized and will be used for the purposes of research only.

I agree to take part in this study.

Date: _____

QUESTIONNAIRES

Demographic questionnaire:

| |
|---|
| First, a few questions about YOU |
|---|

1. Class roll number _____
2. Name _____
3. What is your education level? _____
4. How old are you? _____
5. Are you male or female _____ male
female
6. Are you? _____
Single Engaged Married In a relationship
7. What is your guardian's occupation/ employment
Father / Guardian 1 _____
Mother/ Guardian 2 _____

| | | | | |
|---|------------|----------|------------------|-----------------|
| Does your family own a motor bike car, van or truck (e.g., double cabin cars)? | No | Yes, one | Yes, two or more | Please explain |
| Do you have your own bedroom for yourself? | No | Yes | | |
| During the past 12 months, how many times did you travel away on holiday with your family? | Not at all | Once | Twice | More than twice |
| How many computers does your family own? | None | One | Two | More than two |

8. Who do you live with most days of the week?
Both my mother and my father _____ one parent
One parent and a step-parent / partner
Other family member (please specify) _____
9. What is your religion? _____
10. What is your country of birth? _____
11. Which of these can you do? (Tick mark)

| | ENGLISH | URDU |
|------------|---------|------|
| UNDERSTAND | | |

| | | |
|--------------|--|--|
| SPEAK | | |
| READ | | |
| WRITE | | |

12. Do you use a language other than English at your home?

- a. Yes
- b. No

If yes what is that? _____

13. Do you live in joint family system or in nuclear family?

Joint family

nuclear family

14. Do you feel that you have some impairment/disability?

- a. Yes
- b. No

If yes please specify _____

15. Have you ever been diagnosed with any physical or mental condition?

- a. Yes
- b. No

If yes, specify _____

16. Are you currently suffering from any diagnosed physical or mental health condition?

- a. Yes
- b. No

If yes please specify

Life events scale:

Next, could you answer the following questions about things that may have happened to you. If they have, please indicate if this was in the last 12 months and / or more than a year ago.

| | | | |
|---|--|--------------------------|----|
| | <i>Tick both these options if you need to:</i> | | |
| Have you had problems keeping up with School work? | Yes in past 12 months | Yes more than a year ago | No |

| | | | |
|--|-----------------------|--------------------------|----|
| Have you had difficulty in making or keeping friends? | Yes in past 12 months | Yes more than a year ago | No |
| Have you had any serious arguments or fights with friends? | Yes in past 12 months | Yes more than a year ago | No |
| Have you had any serious problems with a boyfriend or girlfriend? | Yes in past 12 months | Yes more than a year ago | No |
| Have you been bullied in school? | Yes in past 12 months | Yes more than a year ago | No |
| Have your parents separated or divorced? | Yes in past 12 months | Yes more than a year ago | No |
| Have you had any serious arguments or Fights with either or both of your parents? | Yes in past 12 months | Yes more than a year ago | No |
| Have your parents had any serious arguments or fights? | Yes in past 12 months | Yes more than a year ago | No |
| Have you or any of your family had a serious illness or accident? | Yes in past 12 months | Yes more than a year ago | No |
| Have any close friends had a serious illness or accident? | Yes in past 12 months | Yes more than a year ago | No |
| Have you been seriously physically abused? | Yes in past 12 months | Yes more than a year ago | No |
| Have you been in any trouble with the Police? | Yes in past 12 months | Yes more than a year ago | No |
| Has anyone among your immediate family (mother, father, brother or sister) died? | Yes in past 12 months | Yes more than a year ago | No |
| Has anyone else close to you died? | Yes in past 12 months | Yes more than a year ago | No |
| Has anyone among your family or close friends committed suicide? | Yes in past 12 months | Yes more than a year ago | No |
| Has anyone among your family attempted suicide or deliberately harmed themselves? | Yes in past 12 months | Yes more than a year ago | No |

| | | | |
|--|-----------------------|--------------------------|----|
| Has anyone among your close friends attempted suicide or deliberately harmed themselves? | Yes in past 12 months | Yes more than a year ago | No |
| Has anyone forced you (i.e. physically or verbally) to engage in sexual activities against your will? | Yes in past 12 months | Yes more than a year ago | No |
| Has any other distressing event occurred involving you, your family or close friends? | Yes in past 12 months | Yes more than a year ago | No |

If 'yes' please describe.

Adolescent Relationship Scales Questionnaire:

**Think about all the people in your life.
Now read each of the following statements and rate how much it describes your feelings.**

| | | | | | |
|--|------------|-------------------|------------|-----------------|------------------|
| 1. I find it hard to count on other people. | Not at all | Somewhat unlikely | moderately | Somewhat likely | Extremely likely |
| 2. It is very important to me to feel independent. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 3. I find it easy to get emotionally close to others. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 4. I worry that I will be hurt if I become too close to others. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 5. I am comfortable without close emotional relationships. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |

| | | | | | |
|---|------------|-------------------|------------|-----------------|------------------|
| 6. I want to be completely emotionally close with others. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 7. I worry about being alone. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 8. I am comfortable depending on other people. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 9. I find it difficult to trust others completely. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 10. I am comfortable having other people depend on me. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 11. I worry that others don't value me as much as I value them. | Not at all | Somewhat unlikely | moderately | Somewhat likely | Extremely likely |
| 12. It is very important for me to do things on my own. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 13. I'd rather not have other people depend on me. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 14. I am kind of uncomfortable being emotionally close to people. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 15. I find that people don't want to get as close as I would like. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 16. I prefer not to depend on people. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |
| 17. I worry about having people not accept me. | Not at all | Somewhat unlikely | Moderately | Somewhat likely | Extremely likely |

Significant others scale:

Please rate the Please list on next page people who are important in your life. Possible relationships include friends, partner, mother, father, children, brothers, sisters, other relatives, work colleagues, and so on. For each person you list, circle a number from 1 to 7 to show how well they provide the type of help listed. The second part of each question asks you to rate how you would like things to be if they were exactly as you would most hope for. Again circle a number from 1 to 7 to show what rating this would involve. Use further *Significant Others Scale* sheets if appropriate

name/relationship: _____

- | | | | | |
|---|--|---|---|---|
| 1 | <p><i>A</i> Can you trust, talk to frankly and share feelings with this person?</p> <p><i>B</i> What rating would your ideal be?</p> | <p><i>Never</i></p> <p><i>Never</i></p> | <p><i>sometimes</i></p> <p><i>sometimes</i></p> | <p><i>always</i></p> <p><i>Always</i></p> |
| 2 | <p><i>A</i> Can you lean on and turn to this person in times of difficulty?</p> <p><i>B</i> What rating would your ideal be?</p> | <p><i>Never</i></p> <p><i>Never</i></p> | <p><i>sometimes</i></p> <p><i>sometimes</i></p> | <p><i>always</i></p> <p><i>always</i></p> |
| 3 | <p><i>A</i> Do they give you practical help?</p> <p><i>B</i> What rating would your ideal be?</p> | <p><i>Never</i></p> <p><i>Never</i></p> | <p><i>sometimes</i></p> <p><i>sometimes</i></p> | <p><i>always</i></p> <p><i>always</i></p> |
| 4 | <p><i>A</i> Can you spend time with them socially?</p> <p><i>B</i> What rating would your ideal be?</p> | <p><i>Never</i></p> <p><i>Never</i></p> | <p><i>Sometimes</i></p> <p><i>sometimes</i></p> | <p><i>Always</i></p> <p><i>always</i></p> |

name/relationship: _____

- | | | | | |
|---|--|---|---|---|
| 1 | <p><i>A</i> Can you trust, talk to frankly and share feelings with this person?</p> <p><i>B</i> What rating would your ideal be?</p> | <p><i>Never</i></p> <p><i>Never</i></p> | <p><i>sometimes</i></p> <p><i>sometimes</i></p> | <p><i>always</i></p> <p><i>Always</i></p> |
| 2 | <p><i>A</i> Can you lean on and turn to this person in times of difficulty?</p> <p><i>B</i> What rating would your ideal be?</p> | <p><i>Never</i></p> <p><i>Never</i></p> | <p><i>sometimes</i></p> <p><i>sometimes</i></p> | <p><i>always</i></p> <p><i>always</i></p> |
| 3 | <p><i>A</i> Do they give you practical help?</p> <p><i>B</i> What rating would your ideal be?</p> | <p><i>Never</i></p> <p><i>Never</i></p> | <p><i>sometimes</i></p> <p><i>sometimes</i></p> | <p><i>always</i></p> <p><i>always</i></p> |

- | | | | | | |
|---|----------|--|--------------|------------------|---------------|
| 4 | <i>A</i> | Can you spend time with them socially? | <i>Never</i> | <i>Sometimes</i> | <i>Always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |

name/relationship: _____

- | | | | | | |
|---|----------|---|--------------|------------------|---------------|
| 1 | <i>A</i> | Can you trust, talk to frankly and share feelings with this person? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>Always</i> |
| 2 | <i>A</i> | Can you lean on and turn to this person in times of difficulty? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| 3 | <i>A</i> | Do they give you practical help? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| 4 | <i>A</i> | Can you spend time with them socially? | <i>Never</i> | <i>Sometimes</i> | <i>Always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |

name/relationship: _____

- | | | | | | |
|---|----------|---|--------------|------------------|---------------|
| 1 | <i>A</i> | Can you trust, talk to frankly and share feelings with this person? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>Always</i> |
| 2 | <i>A</i> | Can you lean on and turn to this person in times of difficulty? | <i>Never</i> | <i>sometimes</i> | <i>Always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>Always</i> |
| 3 | <i>A</i> | Do they give you practical help? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| 4 | <i>A</i> | Can you spend time with them socially? | <i>Never</i> | <i>Sometimes</i> | <i>Always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |

name/relationship: _____

- | | | | | | |
|---|----------|---|--------------|------------------|---------------|
| 1 | <i>A</i> | Can you trust, talk to frankly and share feelings with this person? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>Always</i> |

- | | | | | | |
|---|----------|---|--------------|------------------|---------------|
| 2 | <i>A</i> | Can you lean on and turn to this person in times of difficulty? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| 3 | <i>A</i> | Do they give you practical help? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| 4 | <i>A</i> | Can you spend time with them socially? | <i>Never</i> | <i>Sometimes</i> | <i>Always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |

name/relationship: _____

- | | | | | | |
|---|----------|---|--------------|------------------|---------------|
| 1 | <i>A</i> | Can you trust, talk to frankly and share feelings with this person? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>Always</i> |
| 2 | <i>A</i> | Can you lean on and turn to this person in times of difficulty? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| 3 | <i>A</i> | Do they give you practical help? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |
| 4 | <i>A</i> | Can you spend time with them socially? | <i>Never</i> | <i>Sometimes</i> | <i>Always</i> |
| | <i>B</i> | What rating would your ideal be? | <i>Never</i> | <i>sometimes</i> | <i>always</i> |

Hospital Anxiety and Depression Scale:

The next questions are about how you have been feeling recently. Please tick the box which best describes your feelings in the past week.

1. **I feel tense and 'wound up'**

| | |
|-----------------------------|-------------------|
| Most of the time | A lot of the time |
| Time to time – occasionally | Not at all |

2. **I still enjoy the things I used to enjoy as much**

| | | | |
|------------|-------------------|---------------|---------------|
| Definitely | Not quite so much | Only a little | Hardly at all |
|------------|-------------------|---------------|---------------|

3. **I get a sort of frightened feeling as if something awful is about to happen**

| | |
|-----------------------------------|------------------------|
| Very definitely and quite badly | Yes, but not too badly |
| A little, but it doesn't worry me | Not at all |

Inventory of Interpersonal Problems:

People have reported having the following problems in relating to other people. Please read the list below, and for each item, consider whether it has been a problem for you with respect to any significant person in your life. Then choose the response that best describes how distressing that problem has been.

The following are things you find hard to do with other people.

| A. IT IS HARD FOR ME TO: | | | | | |
|--|------------|--------------|------------|-------------|-----------|
| 1. Say "no" to other people | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 2. Join in on groups | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 3. Keep things private from other people | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 4. Tell a person to stop bothering me | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 5. Introduce myself to new people | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 6. Confront people with problems that come up | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 7. Be assertive with another person | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 8. Let other people know when I am angry | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 9. Socialize with other people | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 10. Show affection to people | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 11. Get along with people | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 12. Be firm when I need to be | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 13. Experience a feeling of love for another person | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 14. Be supportive of another person's goals in life | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 15. Feel close to other people | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 16. Really care about other people's problems | Not at all | A little bit | Moderately | Quite a bit | Extremely |

| | | | | | |
|--|------------|--------------|------------|-------------|-----------|
| 17. Put somebody else's needs before my own | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 18. Feel good about another person's happiness | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 19. Ask other people to get together socially with me | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 20. Be assertive without worrying about hurting the other person's feelings | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| B. THE FOLLOWING ARE THINGS THAT YOU DO TOO MUCH: | | | | | |
| 1. I open up to people too much | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 2. I am too aggressive toward other people | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 3. I try to please other people too much | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 4. I want to be noticed too much | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 5. I try to control other people too much | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 6. I put other people's needs before my own too much | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 7. I am overly generous to other people | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 8. I manipulate other people too much to get what I want | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 9. I tell personal things to people too much | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 10. I argue with other people too much | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 11. I let other people take advantage of me too much | Not at all | A little bit | Moderately | Quite a bit | Extremely |
| 12. am affected by another person's misery too much | Not at all | A little bit | Moderately | Quite a bit | Extremely |

Youth Health Risk Behavior Survey

THE NEXT QUESTION ASKS ABOUT DELIBERATELY HURTING YOURSELF ON PURPOSE

1. During the past 12 months, how many times did you do something to purposely hurt yourself without wanting to die, such as cutting or burning yourself on purpose?

0 times 1 time 2 to 3 times 4 to 5 times 6 or more times

