Mental Health and Disordered Eating Behaviors of Adolescents in Context of Sexual and Reproductive Health: Mediating Role of Body Image

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Abstract: The present study was conducted to examine the effect of knowledge and experiences related to sexual and reproductive health (SRH), attitude towards sexuality on disordered eating behaviors and mental health as well as the mediating role of body image (body satisfaction, body image guilt, and shame) among adolescents. Survey method was used for data collection from 1011 adolescents through convenience sampling from different schools/colleges of five regions of Pakistan namely Federal/Punjab, Sindh, AJK, Balochistan, and KPK. As assumed, results in the present study showed that disordered eating behaviors were significantly negatively correlated with body satisfaction. Results further confirmed that body image guilt and shame predicted eating withdrawal and overeating. Body satisfaction and body image guilt and shame mediated the relationship between knowledge and experiences related to SRH in predicting disordered eating behaviors and mental health; this assumption was partially accepted among girls, however, it was rejected among boys. This study concluded that a lack of body satisfaction creates eating problems. Promoting body satisfaction and positive affirmations of body image could not only help prevent disordered eating behaviors, it may also promote mental health of today's youths.

Key words: Adolescents, Body Image, Mental Health, Sexual and Reproductive Health (SRH)

Introduction

Adolescence is one of the most dynamic stages of human development and the transition phase between childhood and adulthood. Adolescence is accompanied by intense cognitive, social, emotional, and physical changes that present both challenges and opportunities to adolescents, families, educators, health professionals, and communities. Life experiences during adolescence contribute considerably to the maturation and unique characteristics of the young adult.

The World Health Organization (WHO, 2001) defines adolescence as the period between childhood and adulthood with an age range of 10 to 19 years. Adolescence is a period marked by sexual maturation and this Sexual development, during adolescence, is a complex phenomenon; involving the development of sexual identity and sexual maturation (Goddings et al., 2019). Puberty is often accompanied by various biological changes and socio-psychological pressures that have very serious implications for the physical and mental health of adolescents (Abdukakhorovna, 2021; Owens et al., 2020). Young adolescents are often preoccupied with their bodily changes and how they are perceived by others especially in this age of social media where everyone is in pursuit of the perfect body (Sandhu & Sandhu, 2021). Changes in them may occur earlier or later, but ultimately these changes may be perceived by adolescents as weird or abnormal.

An intensified preoccupation with body image and an increased awareness related to sexuality are necessary psychosocial tasks for adolescents. The physical changes accompanied by sexual maturity, psycho-socially, impact boys and girls differently. Some of the examples of these differences is that among girls, rounding of the body and rise in subcutaneous fat, the beginnings of breasts, and at the end of the spurt, pubic hair and the menarche (the first period) occurs (Allison & Hyde, 2013; Harel et al., 2006; Mehrabi et al., 2016; Williams et al., 2013). Among boys, the testes, penis, and scrotum are enlarged; the voice begins to deepen; pubic hair appears; and they start to experience nocturnal emissions (wet dreams or ejaculations) (Martins–Umeh & Udechukwu, 2019). There are significant hormonal developments namely androgen (in boys) and estrogen (in girls) (Martins–Umeh & Udechukwu, 2019; Montgomery & Côté, 2003). During puberty most adolescents are not aware and prepared for bodily changes and this exacerbates the development of poor body image (including dissatisfaction, guilt and shame) and disordered eating behaviors (including overeating and withdrawal from eating) (Irvine et al., 2020; Schuck et al., 2018). In advance knowledge about the changes occurring during puberty may lead to better outcomes for adolescents.

Lack of knowledge about menarche in girls could lead to fear, anxiety, distress (Bashir et al, 2020), poor body image and eating disturbances (Hunger & Tomiyama, 2018; Mercader-Yus et al, 2018; Zhang et al, 2020). Likewise, the reactions among boys could cause mixed feelings among those who have not been informed regarding sperm Arche and an apparent delay in biological growth and sexual maturation may lead to the development of psychological issues and poor body image (Baker et al, 2019; Zhu et al, 2017). Some teenagers feel uncomfortable due to bodily and hormonal changes because these changes make them vulnerable and chaotic, cause mood fluctuation, create negativeself-image, and cause difficulty in communication with peers and parents (Owens et al, 2020; Maciejewski et al, 2019). As such, information on these changes could assist youth to develop a more positive body image.

The majority of youth living in developing countries are at risk of developing adverse health consequences due to and an unhealthy self-image about the body from inappropriate sources; sometimes parents themselves are less informed or have myth-based information about sexual maturation which they propagate to their children (Chandar et al, 2021). Among the older generation menstruation was considered to be embarrassing and inconvenient (Abrahams et al, 1995; Parwej et al, 2005) and information about this biological process was often incomplete and or misleading (Abioye-Kuteyi, 2000; Busari, 2012; Roberts, 2000) which may trickle down to some adolescents today; especially in Asian societies where children are more receptive to their parents (Brar et al, 2018). Many recent researches also find strong evidence for a

lack of menstrual hygiene practices in developing countries (Kaur et al, 2018; Senapathi & Kumar, 2018). Studies have observed that Poor awareness among youths may reduce the wellbeing of individuals due to increased risk of developing various sexually transmitted diseases and unwanted pregnancies (Munakampe et al, 2018; Lewandowski et al, 2018). It has been observed that women having access to better knowledge about safety practices and menstrual hygiene are less susceptible to UTIs (Urinary tract infections), RTI (Respiratory tract infections) and other associated adverse outcomes (Van Eijk et al, 2016; Weiss et al, 2018; Nabwera et al, 2021). Although in comparison to females, research is limited on boys' first experience with their sexual maturation; some evidence proposes that boys in adolescence are, also, more comfortable when adults prepare them and those who were not prepared report feeling "somewhat perplexed" upon experiencing their first ejaculations with semen (Chad, 2020). Thus, developing positive attitudes, acquiring accurate knowledge, and creating healthy behaviors and practices at an early age sets the stage for longer-term better health.

Sexual attitudes and knowledge is influenced by many factor among which the most prominent are distinct socioeconomic, political, cultural, and historical aspects. An individual's culture has a significant impact on their body image; while predicting body image dissatisfaction helps predict disordered eating (Sotiriou, 2021). In Western cultures engaging in sexual behaviors is often seen in a more liberal light, while it is seen as primarily procreative and conservative in Asian cultures (Ho et al, 2011; Dimitrova, 2018). Since sexual attitudes are defined in context of cultural norms (Coyne et al, 2019), the definition of sexual dysfunction also changes from country to country (Bhavsar & Bhugra, 2013; Atallah et al, 2016; Sayin & Kocatürk, 2019). Specifically, in Pakistan's context more conservative attitudes are encouraged (Abbas, 2018) so what may be seen as liberal in one society may appear dysfunctional in another, As such an appropriate attitude towards sexuality is necessary for feeling healthy. Having appropriate sexual and reproductive knowledge can also affect how adolescents perceive their body image however with the increasing use of social media most youths form their knowledge and attitude towards sex based on it, additionally their exposure to the diverse attitudes towards online sexual content can dramatically shift and distort their own body image(Coyne et al, 2019).

In Pakistan, youth aged 15 to 24 years comprise 36% of the population according to a UNICEF report (UNICEF, 2020). Yet in Pakistan research on adolescents in context of Sexual and Reproductive Health (SRH) is relatively new and is scarce, mainly due to social taboos limiting open SRH related discussions, 'specifically amongst unmarried youth (Khan, 2000; Iqbal et al, 2017) and even among the general population knowledge attitude and practice about HBV, HCV and HIV leaves a lot to be desired (Farhin et al, 2018). Since open sexuality discussion is discouraged, therefore, little is known of sexual behavior and attitudes of youth in Pakistan (Khan 2000; Bott & Jejeebhoy, 2001; Shaikh et al, 2019; Ehsan et al, 2019). However, a research on sexual behavior and attitudes of youth in Pakistan does find that knowledge about biological functionin may result in improved sextual health and higher contraceptive use among adolescents (Ajmal et al, 2011). The present study aimed to assess the high risk behaviors currently prevalent in Pakistan (i.e., disordered eating behaviors) in context of KAPs (knowledge, attitude and practices) regarding sexuality and reproductive health, and comparing these variables between girls and boys school/college students in Pakistan.

Based on the literature review, the following hypotheses were formulated for the male and female sample:

1. Body image guilt and shame will predict disordered eating behaviors among adolescents.
2. Body satisfaction and body image guilt and shame will mediate the relationship between adolescents' 'knowledge and experiences related to SRH and 'disordered eating and mental health'.

Instruments

Knowledge and Practices Related to SRH Questionnaire. This scale was developed by Kamal and Jami (2017) to measure the knowledge and practices related to SRH among adolescents. Two separate forms were developed due to different reproductive issues of males and females; these included items related to menstruation (only females) and nocturnal emission (only males). Items related to general SRH knowledge, pregnancy, family planning, and sexually transmitted infections/diseases were same for both genders. Total number of items in the male version was 19 and in the female version was 27. Scores on all domains were summed up to have a composite score of knowledge related to SRH. High scores indicate a high level of knowledge on SRH and low scores represent a lower level of knowledge of SRH.

Checklist of Experiences related to Menstruation (CEM). This scale was developed by Aflaq and Jami (2012) in order to explore experiences related to menstruation and was translated into Urdu. It consists of 20 items in total. The reliability of the scale was .95. Scoring procedure was determined through Yes/No responses. *'Yes'* was assigned a score of 1 and *'No'* was assigned a score of 0. High scores on CEM showed positive experiences related to menstruation whereas low scores showed negative experiences related to menstruation. In order to assess the experiences related to nocturnal emissions among boys, the items 1 to 11 of the CEM were modified where the word 'menstruation' was replaced by nocturnal emission. Therefore, for boys this checklist was named the Checklist of Experiences related to Nocturnal Emissions (Kamal & Jami, 2017).

Attitude Towards Sexuality Scale (ATSS). It was developed by Fisher and Hall (1988) and translated and adapted into Urdu for better understanding by the participants. The final, Urdu version of ATSS (ATSS-U) contained 10 items instead of the original 14 due to the removal of unnecessary items that were redundant in the present setting. This scale covers attitude on the areas of sexuality including nudity, abortion, contraception, premarital sex, pornography, prostitution, homosexuality, and venereal disease. The score range of ATSS is 12 to 60. The reliability of the scale was .75 (Fisher & Hall, 1988). Low score on the scale shows conservative attitude towards sexuality, and a high score shows liberal attitude towards sexuality.

WHO (Five) Well-Being Index. It was developed by Topp, Ostergaard, Sondergaard, and Bech (2015). The WHO-5 is a short and generic global rating scale measuring subjective well-being. For present research, the Urdu version of this scale is used (5 items). It is a 6-point Likert scale and each of the 5 items is scored from 5 (*all of the time*) to 0 (*none of the time*). Low score represents

the worst possible mental health, whereas a high score represents the best possible mental health. The reliability of the scale ranges from .81 to .86 (Topp et al., 2015).

Multidimensional Body Self Relation Questionnaire-Appearance Scale (MBSRQ-AS) Urdu Version. It was developed by Cash (2000) and translated by Naqvi and Kamal (2017). The MBSRQ- Appearance Scale (MBSRQ-AS) Urdu version is a 27 item measure that consists of 4 subscales. In the present research, only Body Area Satisfaction subscale is used. Its 5-points rating options are classified as 1 (*dissatisfied*) to 5 (*satisfied*) (Cash, 2000). High scores represent more satisfaction with discrete areas of the body, while low scores represent more dissatisfaction.

Body Image Guilt and Shame Scale (BIGSS). It is a specific body-related, scenario based measure that indicates proneness to shame and proneness to guilt about one's body and body related behaviors. It was developed by Thompson, Dinnel, and Dill (2003), and translated in the present study. It is a 15-item measure with scenario-based items followed by 4 response options having a response category of 5-point Likert scale. It consists of 2 subscales, Body Image Guilt, and Body Image Shame. The scale has no reverse score items. Only Shame and Guilt subscales were scored in the present study, with externalization/ rationalization and detachment serving as filler items. For Body Image guilt, a reliability of .88 and for Body Image Shame, a reliability of .91 was determined by the original authors (Thompson et al., 2003). High score represents a high level of guilt and shame.

Disordered Eating Behavior Scale. It is a 26-item indigenous self-report measure for disordered eating patterns and behaviors (Muazzam & Khalid, 2011). Respondents use a 5-point scale on which 0 represents *never* and 4 represents *always* to indicate the extent to which each item described them. There are no reverse score items. For present research, two subscales were used i.e. Eating Withdrawal and Overeating. The alphas for Eating Withdrawal, and Overeating are .84 and .83 respectively (Muazzam & Khalid 2011). High scores represent that the individual is more prone to disordered eating behavior.

Sample

The sample of this study consisted of 1,011 school attending adolescents (i.e., 527 girls and 484 boys). Only school going participants were selected with an age range of 13 to 18 years (M = 15.75, SD = 1.53). The sample was collected from five regions (i.e., Federal/Punjab, Khyber Pakhtunkhwa [KPK], Balochistan, Sindh, and Azad Jammu and Kashmir [AJK]) of Pakistan. Data was collected through convenience sampling by visiting different schools and colleges of seven districts including Islamabad/Rawalpindi, Abbottabad, Haripur, Quetta, Neelam Valley, Umerkot, and Multan.

Procedure

A cross-sectional research design utilizing surveys for data collection was used. Permission was taken from the school and college authorities in order to collect data. In order to ensure the willingness of the participants, informed consent in written format was given to participants to ask for their signature. The participants were also given assurances that the data would only be used for research purposes that were academic in nature. After the data was collected it was analyzed using spss.

Results

The results are displayed in the form of tables and models. Mediation of variables was studied using linear regression analysis through process macro by Andrew Hayes and AMOS version 21. The analyses for knowledge related to sexual and reproductive health (SRH), and experiences related to reproductive health (i.e., menstruation for girls, and nocturnal emission for boys) were done separately for girls and boys due to different measures used for both of them. For knowledge related to SRH, a composite score was calculated by computing the correct options separately for boys and girls.

Table 1

Mean, Standard Deviation, Frequency, Percentage, and Chi-Square, along Demographic Variables across Gender (N = 1011)

	Boys (n = 484)		Girls (n = 527)			
Demographics	*f*	%	*f*	%	*M*	*SD*
Age	-	-	-	-	15.75	1.53
Education	-	-	-	-	9.89	1.47
Family Income (in Rs.)	-	-	-	-	42669.44	113047.359
Family System						
Nuclear	281	28.6	353	35.9	-	-
Joint	188	19.1	161	16.4	-	-
Missing	15	3.1	13	2.5	-	-
Place of Living						
Urban	287	28.6	385	38.3	-	-
Rural	193	19.2	140	13.9	-	-
Missing	4	0.8	2	0.4	-	-
Province						
Federal	44	9.1	15	2.8	-	-
Punjab	147	30.4	201	38.1	-	-
KPK	121	12.0	122	12.1	-	-
AJK	63	6.2	70	6.9	-	-
Sindh	51	5.1	55	5.5	-	-
Balochistan	58	5.7	62	6.1	-	-
Part of Awareness Program						
Yes	141	13.9	194	19.2	-	-
No	343	33.9	333	32.9	-	-

*p < .05. ***p < .001.

Table 1 shows the mean, standard deviation of the sample (N = 1011) across age, education, number of siblings, and family's income. Additionally, it depicts the chi-squared differences across demographic variables to assess equivalence in sample distribution across gender.

Table 2

Frequency and Percentage along Onset of Puberty across Gender (N = 1011)

	Boys (n = 484)		Girls (n = 527)	
Onset of Puberty	*f*	%	*f*	%
Experiencing Menstruation				

No	-	-	62	11.8
Yes	-	-	465	88.2
Experiencing Nocturnal Emissions				
No	96	19.8	-	-
Yes	388	80.2	-	-

Table 2 shows the frequencies and percentages across those participants who have experienced the onset of puberty. It shows that 88.2% of the girls are experiencing menstruation and 80.2% of the boys are experiencing nocturnal emissions.

Model Testing

Predictors of disordered eating behaviors and mental health among girls (*n* = 465)

Table 3

Model Fit Indices for Model in Predicting Disordered Eating Behaviors, and Mental Health among Girls (n=465)

Model	χ^2(d*f*)	χ^2/d*f*	GFI	IFI	CFI	RMSEA	SRMR
M1	1.59(1)	1.59	.99	.99	.99	.03	.01
M2	14.17(12)	1.18	.99	.99	.99	.02	.02

Note. GFI = Goodness of Fit Index, IFI = Incremental Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, and SRMS = Standardized Root Mean Square Residual; M1 = Default Model; M2 = After deleting nonsignificant paths

(*p < .05. ***p < .001).

To explore the simultaneous role of study variables as predictors and mediators in predicting disordered eating behaviors (i.e., eating withdrawal, and overeating) and mental health among girls. A model with predictive relationship of knowledge of SRH, experiences related to menstruation, and attitude towards sexuality with mental health and eating withdrawal and overeating through a process where body satisfaction and body image guilt and shame are the mediators was tested. Model testing was carried out in AMOS version 21 and Structural Equation Modeling (SEM) was computed. Table 3 shows the steps involved in achieving pathways and goodness of fit in the model 1. Model 1 shows that all indices are in range; however, nonsignificant paths were examined and after deleting the paths, model fit was achieved, and M2 is considered a good fit model. The pictorial presentation of the fitted model is given in Figure 1.

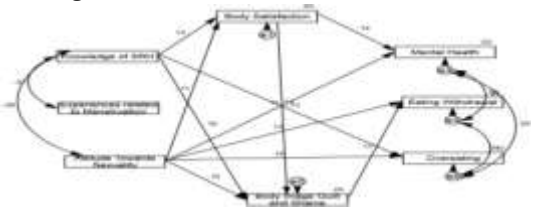

Figure 1. Model explaining prediction for disordered eating behaviors and mental health among girls (*n* = 465)

According to the results in Figure 1, Greater knowledge of sexual and reproductive health (SRH) indirectly predicts better mental health through greater body satisfaction. Greater knowledge of SRH directly predicts increased overeating. Additionally, greater knowledge of SRH indirectly leads to increased eating withdrawal through worse body image guilt and shame. Furthermore, greater knowledge of SRH predicts increased body image guilt and shame directly but increase in knowledge of SRH indirectly predicts decrease in body image guilt and shame through a direct prediction of increasing body satisfaction.

The proposed model shows that more liberal attitudes towards sexuality directly predict improved mental health. Liberal attitude towards sexuality indirectly predicts worsened mental health through body satisfaction indicating that as attitude towards sexuality becomes liberal, body satisfaction decreases resulting in poor mental health. Additionally, liberal attitudes towards sexuality directly predicts disordered eating i.e. (eating withdrawal, and overeating). Increased body image guilt and shame mediates the relationship between liberal attitude towards sexuality and increased eating withdrawal.

Table 4

Model Fit Indices for Model in Predicting Disordered Eating Behaviors, and Mental Health among Girls (n = 465)

			Disordered Eating				Body Image			
	Mental Health		Withdrawal		Overeating		Satisfaction		Guilt and Shame	
	β Direct	β Indirect	β Direct	β Indirect	B Direct	β Indirect	β Direct	β Indirect	β Direct	β Indirect
KSRH	-	.02*	-	.02*	.14*	-	.13*	-	.18*	-.01*
ATS	.11*	-.01*	.12*	.01*	.15*	-	-.10*	-	.09	.01*
BS	.14*	-	-	-.02*	-	-	-	-	-.13*	-
BIGS	-	-	.17*	-	-	-	-	-	-	-

Note. KSRH = Knowledge of Sexual and Reproductive Health; ATS = Attitude Towards Sexuality; BS = Body Satisfaction; BIGS = Body Image Guilt and Shame.

(*p < .05. ***p < .001).

On the other hand, increased body satisfaction directly predicts improved mental health and reduced body image guilt and shame. Similarly, increased body satisfaction indirectly predicts reduced eating withdrawal. and increased body image guilt and shame directly predicts increased eating withdrawal. Table 4 shows the significant direct and indirect paths of outcome and predictor variables. Hypothesis 1: body image guilt and shame leads to disordered eating behaviors is accepted. Furthermore, Hypothesis 2 is partially accepted among girls.

Predictors of disordered eating behaviors and mental health among boys (*n* = 388).

Table 5

Model Fit Indices for Model in Predicting Disordered Eating Behaviors, and Mental Health among Boys (n = 388)

Model	χ^2(df)	χ^2/df	GFI	IFI	CFI	RMSEA	SRMR
M1	1.05(1)	1.05	.99	1.00	1.00	.01	.009
M2	13.46(14)	.96	.99	1.00	1.00	.00	.02

Note. GFI = Goodness of Fit Index, IFI = Incremental Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, and SRMS = Standardized Root Mean Square Residual; M1 = Default Model; M2 = After deleting non-significant paths
(*$p \leq .05$; *** $p < .001$).

Table 6

Model Fit Indices for Model in Predicting Disordered Eating Behaviors, and Mental Health among Boys (n=388)

	Disordered Eating						Body Image			
	Mental Health		Withdrawal		Overeating		Satisfaction		Guilt and Shame	
	β Direct	β Indirect	β Direct	β Indirect	β Direct	β Indirect	β Direct	β Indirect	β Direct	β Indirect
KSRH	.13*	-	-	-	.19*	-	-	-	-	-
ATS	.10*	-.06*	.26*	-	.09	.02*	-.19*	-	-	-
BS	.32*	-	-	-	-.10*	-	-	-	-	-
BIGS	-	-	.17*	-	-	-	-	-	-	-

Note. KSRH = Knowledge of Sexual and Reproductive Health; ATS = Attitude Towards Sexuality; BS = Body Satisfaction; BIGS = Body Image Guilt and Shame. (***$p < .001$. *$p < .05$).

A model with predictive relationship (see Figure 2, Table 5 and 6) of knowledge of SRH, experiences related to nocturnal emission, and attitude towards sexuality with mental health and eating withdrawal and overeating through a process where body satisfaction and body image guilt and shame are the mediators was tested.

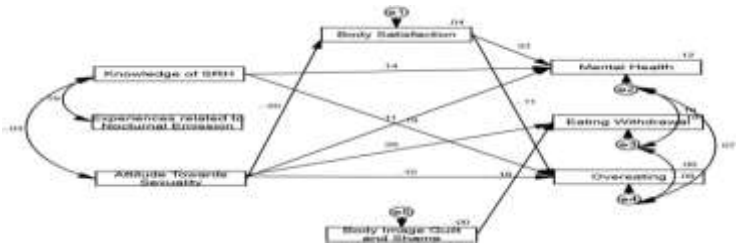

Figure 2. Model explaining prediction for disordered eating behaviors and mental health among boys (n = 388)

According to the results in Figure 2, Greater knowledge of SRH directly predicts improved mental health and increased overeating. Liberal attitudes towards sexuality directly predicts increased Disordered Eating (eating withdrawal and overeating) and improved mental health. Liberal attitudes towards sexuality also directly predict reduced body satisfaction.

Liberal attitudes towards sexuality indirectly predict reduced mental health and increased overeating through decreased body satisfaction. On the other hand, improved body satisfaction directly predicts improved mental health and reduced overeating. Greater body image guilt and shame directly predicts increased eating withdrawal. Therefore, Hypothesis 1 is accepted and Hypothesis 2 is rejected among boys.

Discussion

The aim of this study was to investigate the effect of knowledge and experiences related to sexual and reproductive health (SRH) on mental health and disordered eating behaviors through the mediating role of body satisfaction and body related guilt and shame The predictors of mental health and disordered eating behaviors in proposed model were tested separately for each gender. Due to their different SRH issues (Dasgupta & Sarkar, 2008); different measures related to SRH were given to them pertaining to their respective reproductive health issues.

Model Testing in Girls

As the results (Table 4) suggest; SRH knowledge does significantly predict mental health and disordered eating through body image. According to findings, when body satisfaction is positively affected by SRH knowledge it also positively affects mental health and when body image is negatively affected by SRH knowledge it negatively affects disordered eating (eating withdrawal). When increased knowledge does not predict body satisfaction it instead predicts worsened disordered eating (indirectly eating withdrawal and directly overeating) and worse body image. Based on the results, an assumption can be made that various factors may be either confounding or extraneous and these may need to be controlled to explain why increased SRH knowledge predicts worsening disordered eating in cases where body satisfaction is not positively affected by SRH knowledge, as review of the literature reveals that one of the factors (i.e. social media use) which results in improved SRH knowledge also causes negative body image (Coyne et al, 2019) which in turn may result in disordered eating among adolescents. In addition social expectations are much high for girls than boys this may explain why their eating is more disordered (Izydorczyk & Sitnik-Warchulska, 2018)Other factors include: appropriate information from media, society, culture, peers, and family that affect body satisfaction (Stang & Story, 2005) and biological factors i.e. Sex hormones can lead to an increase in negative emotions and sensitivity in social interactions (Berk, 2007).

Results reveal that more liberal attitude towards sex was directly predicting improved mental health which is consistent with the literature that having an open and more accepting attitude towards sexuality results in better mental health (Huang et al, 2020). However results show that more liberal attitude towards sex was directly predicting reduced body satisfaction which resulted in decreased mental health these results may be explained by the existence of an unaccounted for variable i.e. Girls scoring higher on sexual attitude scale may only be showing liberal attitude due to an online social desirability factor, however the social desirability of

an online platform, which most adolescents are highly exposed to nowadays, can often be contrary to the social desirability of the physical culture these adolescents find themselves in, and as previously mentioned social media usage also predicts negative body image (Coyne et al, 2019) Furthermore these findings are supported by a study in Zambia which found that those reporting higher liberal attitudes towards sex were more likely to commit sucide and engage in risky sexual behavior (Yang et al, 2019). Furthermore those who identify with a liberal attitude may have to conform to the conservative social climate of Pakistan even if it is contrary to their internal views these conflicting values and views may cause them to be dissatisfied with their body image and result in them being more vulnerable to eating disorders and weaken the mental health of adolescents.

Increased body satisfaction directly predicts improved mental health, reduced body image guilt and shame. These findings are consistent with pre-existing literature that support the fact that being satisfied with one's body leads to can be beneficial in improving mental health and reducing body image guilt and shame (Sotiriou, 2021; Griffen, et al, 2018) and as the increased body satisfaction results in reduced body image guilt and shame this indirectly predicts reduced eating withdrawal. As recommended by Griffen (2018), therapies that improve body satisfaction are useful in treating body image disturbances as well as eating disorders. Findings also show that increased body image guilt and shame directly predicts increased eating withdrawal among girls, Munir, M., & Dawood (2021) report that in Pakistan many adolescent girls with a weight stigma have low body esteem and this results in disordered eating.

Model Testing in Boys

According to table 6, greater knowledge of SRH directly predicts improved mental health and increased overeating. This is concurrent with literature findings that a lack of SRH knowledge often results in psychological issues and poor body image (Baker et al, 2019; Zhu et al, 2017). Overeating is more often related to emotional disturbances according to existing literature (Hsu & Raposa, 2021; Favieri et al, 2021) however the reason for boys' high score on overeating may be influenced by intervening variables like social desirability for boys, muscle mass is important and they try to build masculine body and may indulge themselves in overeating (Baker et al., 2019).

Liberal attitudes towards sexuality directly predict increased disordered Eating (eating withdrawal and overeating) and improved mental health. In Asian cultures, adolescents may suppress or inhibit their overall sexual identity, consciously or unconsciously which may lead to mental health issues (Turban et al, 2020) and this may be because it is socially desirable. Therefore, liberal attitude towards sexuality is associated with less problems regarding sexual identity and make an individual more knowledgeable of sexual behavior resulting in better mental health. The results that liberal attitudes improved mental health are supported by research findings of various researches. Mental health has been observed to improve when individuals are more aware of sexual morality and that those with a negative view on sexuality due to a negative sexual experience had worse mental health (Ilabaca et al, 2015; Wang et al, 2019). According to the results: Liberal attitudes towards sexuality directly predicted reduced body satisfaction among the male sample. The reason for increased disordered Eating and reduced body satisfaction among liberal males may be due to the existence of intervening variables i.e. in the conservative society of Pakistan, those with liberal attitudes may be more liberal because of high online media usage and Adolescents may find it hard to accept their body image if it doesn't correlate with the perfect image portrayed in social media, researches support that the high use of social media among adolescents results in negative body image and eating disorders (Brown & Tiggemann, 2022) since the present research did not measure the effects of online media usage it was not possible to control for it's effect.

Results show that being satisfied with body image predicts improved mental health and reduced overeating; previous researches have already established the importance of body acceptance and how important positive self-image is for promoting healthy behavior and improving wellbeing (Swami et al, 2018; Jankauskiene & Baceviciene, 2019).

Results also found that body image dissatisfaction predicts eating withdrawal; these findings are consistent with literature review as boys eating habits are disrupted by body dissatisfaction and subsequent low self-esteem. (Cruz-Sáez et al, 2020)

Limitations

Sexuality is a culturally sensitive and usually considered age inappropriate topic as such seeking permission for data collection was difficult, therefore a convenience sampling was used in the current study however it would be more informative if future studies focused on selective samples to be explored in depth, Furthermore only two sex's were included in the present study i.e. males and females, in a discussion about sex future researches sholud be more inclusive and address other sex categories as well. Another area that is lacking in present research is catering for the inclusion of gender diversity i.e. individual perceptions of their identity. One other gap within this study was a lack of examination of online usage among adolescents, as it can have vast implications for the health and behaviors of adolescents. It is recommended that future studies take into consideration the presence of extraneous and intervening variables which are most likely to affect the common youths of today so as to control their effects during a study.

Implications

The present study will help the caretakers, teachers, and clinicians plan more effective strategies for implementing educational programs for adolescents to educate them regarding their sexual and reproductive health (i.e. the pubertal changes taking place during adolescents). Adolescent boys often are reluctant to seek help regarding their sexual and reproductive health issues with their parents so they should be given training on how to discuss this issues with their sons. Body satisfaction was found to be a protective factor against disordered eating behaviors so it should be promoted among adolescents to enhance their physical and mental health.

Conclusion

In conclusion the following study found that adolescent boys and girls sexual and reproductive health knowledge can be highly predictive of their eating behavior and mental health, however body image is of paramount importance in this relationship, as knowledge of sexual and reproductive health alone were not predictive of improved mental health and eating behavior. Rather in

some results the direct relationship between these variables showed negative impact of knowledge of sexual and reproductive health on mental health and eating behavior. However when the mediating role of body image was examined in the relationship; the results were more in line with predicted hypothesis and pre-existing literature. As such this study highlights the importance of mediating variables (i.e. body image) when examining the effects of sexual and reproductive health knowledge on eating behavior and mental health.

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