The Relationship between Eating Disorders and Use of Social Media in Teenage and Young Adults in Saudi Arabia

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Abstract: *Background: The cause of eating disorders (ED) is multi-factorial; includes biological, psychological, intrapersonal, and environmental factors. Social media (SM) use is a contributor for ED which is highly prevalent in teenagers and young adult females. Nowadays, the use of SM apps is very high, therefore, this study is conducted to determine and evaluate the relationship between ED and SM use in teenagers and young adults in Saudi Arabia. Methods: This is an analytic cross-sectional study done on teenage and young adults (age 15 – 25 years) to determine and evaluate the relationship between ED and SM use among this age group in Saudi Arabia. An electronic questionnaire is distributed randomly among the age group described. A total of 350 participants were included in the current study (87.14%) of them are females. Data was analysed using SPSS version 25.0. The frequencies, percentage, were conducted to describe the distribution of the questionnaire. The Chi square test was used to test the relationships between the factors, A p value less than 0.05, 0.01 and 0.001 were considered statistically significant. 17 questions are used to score the ED, and accordingly the participants are divided into high, moderate or low score of ED. Results: The results of this study revealed strong and significant positive association between SM use and ED in teenagers and young adults in Saudi Arabia.9.89% of those who spend > 8 hours on SM have a high score of ED compared to 0% of those who spend < 2 hours, while (78.95) of those who spend < 2 hours a day on SM have low ED score compared to (51.65%) of those who spend >8 hours a day. Conclusion: A clear association was found between SM usage and disordered eating cognitions and behaviors.*

Keywords: Eating disorder, social media, teenage, young adult

1. Introduction

SM has become a significant part of life for many people existential. Social media in general, refers to web and mobile platforms that let users connect with one another within a virtual network (such as Facebook, Twitter, Instagram, Snapchat, and TikTok, which invade the world recently), where they can share, co-create, or exchange various types of digital content, such as information, messages, photos, or videos. A 2017 study discovered comparable rates of SM usage (about 70%) among individuals with major mental illness who are undergoing treatment in comparison to groups from the general population shows that SM use among psychiatric populations has increased recently. in this study we are focusing on Eating Disorders. Social and cultural variables have a big impact. Also advertising has been considered as one of these issues, because it might integrate or normalize excessive beauty standards, which might lead to a possibility of developing a type of Eating Disorder. However, further information will be discussed in the Literature Survey.

2. Literature Survey

Social media has become a significant part of life for many persons with mental illness. Social media in general, refers to web and mobile platforms that let users connect with one another within a virtual network (such as Facebook, Twitter, Instagram, Snapchat, and TikTok, which invade the world recently), where they can share, co-create, or exchange various types of digital content, such as information, messages, photos, or videos (1). Based to studies, people with a variety of mental illnesses, such as depression, psychotic disorders, or other severe mental illnesses, use SM platforms at rates similar to those of the general population, with use ranging from about 70% among middle-aged and older people to upwards of 97% among younger people. (2) (3). Social media usage patterns may have effects on mental health and wellbeing, and the possibility to exploit SM's popularity and interactive features to improve the delivery of interventions have all been the subject of recent studies. The dangers and possible damages of SM for mental health are still unknown though (4). A 2017 study that discovered comparable rates of SM usage (about 70%) among individuals with major mental illness who are undergoing treatment in comparison to groups from the general population shows that SM use among psychiatric populations has increased recently (2). Eating disorders (ED) refer to a group of conditions defined by abnormal eating habits that involve either insufficient or excessive food intake. Adolescents and young adults frequently experience EDs. Sometimes they result in psychiatric and physical problems that may impact an individual's life expectancy or even cause their death (5). Studies have shown that people with EDs, particularly those with anorexia nervosa (AN), have much higher mortality rates (6). There are many forms of EDs, which are described in the Diagnostic and Statistical Manual of Mental Disorders (DSM). (American Psychiatric Association, 2013). The most recent DSM-5 classification of Eds include: Anorexia nervosa (AN), Bulimia nervosa (BN), and binge eating disorder (BED). These are the three typical

EDs. Other EDs are referred to as "atypical" forms disorders and named other specified feeding eating disorders (OSFEDs). An OSFED is known as a feeding and ED that develops clinically massive distress or impairment in social life but does not accomplish the full criteria of typical EDs. The rest of the abnormal eating conditions are categorized in DSM-5, under the name unspecified feeding or ED, includes all other disorders not included in the typical ED and OSFED categories. Although social and cultural variables have a big impact, many disorders also have a critical psychobiological component. Advertising has been considered as one of these issues because it might integrate or normalize excessive beauty standards. Therefore, advanced and contemporary civilizations and those with the best living conditions exhibit a higher frequency of these disorders, which is mostly due to the popularization of thin and muscular ideals (7). Disordered eating attitudes have been linked to several biological factors, with up to 50% of disordered eating being described as familiarly transmitted (8). Researchers have also suggested that neurotransmitters in the brain are involved in disordered eating attitudes and, therefore, in ED. Additionally, hormones have been linked as factors to puberty, body perception, and body concerns (9). One of the hormones that have been extensively investigated is testosterone, and blood samples allow for a more accurate assessment. However, a number of academics have suggested the use of indirect markers to avoid collecting biological samples and endangering the participants. The 2D: 4D digital ratio has been used by the majority of research as an indirect measure that strongly influences attractiveness, linking testosterone and estrogen levels (10). The 2D: 4D ratio, based on the length differences between the hands' phalanges, is used to calculate the intrauterine testosterone levels during gestation. A smaller ratio is indicative of a higher level of testosterone. This ratio has reflected the relationship with self-perception, body image, body dissatisfaction, and disordered eating behaviors (11). Based on these studies, the hormone levels, and the indirect marker, might appear to have essential roles in disordered eating attitudes (12). Other factors, such as ethical or familiar factors, contribute to the development of these disordered eating. Additionally, according to some research, having a mother with self-esteem issues or a disordered eating attitude increases the likelihood that the child will also be diagnosed with an ED (13) (14). Moreover, ethnicity has been linked to the perception of beauty ideals, self-esteem, and body perception (15). Another critical factor is the media by which beauty ideals have been promoted. The media is crucial in determining what society considers to be attractive, making the slender beauty ideal among women seem unattainable, (16). These ideals confirmed the way young people perceived themselves and, therefore, how they value themselves (17). Body issues are a result of the discrepancy between the idealized bodies that society presents as role models and the actual bodies that many young women own. Body insecurities typically persist over time and worsen body dissatisfaction. Because of the distortion of the body image, its perception, and thus, body concern, this body dissatisfaction arises. Since it causes emotional and psychological suffering, this dissatisfaction also plays a crucial part in disordered eating attitudes (18). In order to better understand the roots of these disorders, the theory of social comparison and various studies have looked at the connection between body dissatisfaction and disordered eating attitudes. These earlier studies demonstrated that accurate comparisons with other people affect one's perception of one's body and may encourage disorderly eating. Based on previous and recent studies it seems that the role of the media in disordered eating attitudes is noteworthy (19). For some users, excessive use of SM, platforms, and applications that promote community-based interaction, social networking, and content sharing is pathological and may result in the emergence of obsessive-compulsive, excessive, and unrestrained SM use. Social interactions also play a part in and affect mental health issues. (ED) may be fostered in these online groups due to people spending a lot of time on popular SM platforms and the fact that many of our social interactions take place there. Also, SM made it simpler for messages that encourage or support ED to propagate; this may have detrimental impacts on susceptible people, including healthy individuals who may be persuaded to engage in ED behaviors, as well as the 'triggering' of people who may already have an ED. Pro-communities normalize the behavior by supporting one another to practice related ED behaviors, giving the user the impression that doing so is acceptable, justifiable, and occasionally even desirable (20). Similarly, media portrayal of celebrities with perceived ED has been linked to an online practice around ED (21). Another issue is the chance that pro-communities will romanticize or glorify ED, for instance by calling the behaviors "tragically beautiful." (22). Therefore, It is important that we understand the nature of online communities before introducing interventions. We need to know more about the types of ED-related information people using SM are being exposed to (23).

3. Method and approach

Study Design:
An analytic cross-sectional community-based study design is adopted for this research.

Study population:
Males and females age between 15 and 25 years, live in Saudi Arabia. Excluded the age below 15 and more than 25 and people who have any chronic disease.

Sample collection:
A validated electronic questionnaire is sent through WhatsApp and telegram to be filled by males and females who are 15 – 25-year old living in Saudi Arabia. The questionnaire was divided into 3 parts: the first part includes questions about sociodemographic characteristics, such as gender, age and level of education. Also it includes BMI distribution and the presence of chronic illnesses. The second part includes questions about ED. The third part includes the questions about SM use.
The estimated number of samples is 400.

Sample collection and processing:
The sample is randomly selected as males and female teenagers and young adults aged between 15-25 who participated in the questionnaire. The data was secured safely and accessed by authors only.

Data Analysis:
Data was analysed using SPSS version 25.0. The frequencies, percentage, were conducted to describe the distribution of the questionnaire. The Chi square test was used to test the relationships between the factors, A p value less than 0.05, 0.01 and 0.001 were considered statistically significant.

Reliability and validity:
The internal consistency method was used to test the validation of the scale. It is used to confirm that the designed items measure the same factor. It is a function to test how highly these items are correlated, and how good they predict each other. Cronbach's alpha (α) is one usually used method. Internal consistency estimates of a magnitude of α ≥0.70 were considered acceptable (Ritter, 2010). Convergent validity was tested by correlating each item with its own scale/total degree of the scale.

The 17 items of the ED scale had high significance and positive correlation with the total degree of the scale, it ranged between (r=0.791, p<0.01) and (r=0.405, p<0.01), the Cronbach's alpha was great (α=0.91), thus it can confirm that the scale was valid and reliable. The 17 items used to measure the ED level by the 4-point Likert scale from (never =0) to (Nearly all the time=3), the score is calculated for each participant and according to it, the participants are divided into 3 categories; those who are having high score (70% or more), moderate score (50%-< 70%) or low score (< 50%).

4. Results & Discussion

Table 1: Socio- demographic information (N=350)

Actor		N	%
Gender	Male	45	12.86
	Female	305	87.14
Age	15-16	26	7.43
	17-19	82	23.43
	20-22	172	49.14
	23-25	70	20.00
BMI	Underweight	69	19.71
	Normal	184	52.57
	Overweight	56	16.00
	Obese	41	11.71

As shown in Table (1) 350 people participated in the study including 87.14% female and 12.86% male, close to a half (49.14%) aged between 20 and 22 years, followed by 17-19 years old (23.43%), then 23-25 years old (10%), and the least were the 15-16 years old. This table also shows the distribution of participants according to Body Mass Index (BMI). BMI is calculated according to the formula: BMI = weight in kilograms (kg) / height in meters squared (m2). Based on the World Health Organization (WHO) 's guidelines, BMI was categorized as: underweight (BMI<18.5), normal (BMI18.5-<24.9), overweight (BMI 24.9-<29.9), and obese (BMI >29.9).

Table 2

Factor		N	%
Do you have any chronic disease?	Yes	34	9.71
	No	316	90.29

Table 2 shows that 34 participants (9.71%) have chronic diseases, so they are not included in the results related to different factors in the study.

Table 3: Background information (N=316)

Factor		N	%
Has your shape or weight influenced how you think or judge yourself? (N=316)	Yes	21	6.65
	No	238	75.32
	IDK	57	18.04
Have you been diagnosed before with eating disorder? (N=316)	Yes	70	22.15
	No	246	77.85
	IDK	6	1.71
How much time per day do you spend on social media (N=316)	< 2 hours	19	6.01
	2-4 hours	81	25.63
	4-8 hours	125	39.56
	> 8 hours	91	28.80

As shown in Table (3), the majority of the included participants (75.32%) reported that their shape or weight did not influence how they think or judge their selves.22.15% were diagnosed before as having ED.39.65% of the included participants spend 4-8 hours a day on SM, while 28.8% spend >8 hours, 25.63% spend 2-4 hours, and only 6.01% reported that they spend < 2 hours a day on SM.
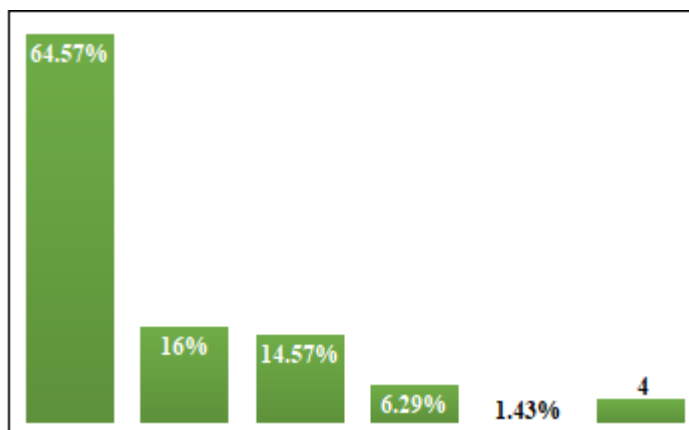

Figure 1: followed certain diets

Figure (1) showed that most of the participants (64.57%) do not follow certain diets to control weight, while the rest (35.43) follow certain diet in the form of calorie control (16%), intermittent fasting (14, 57%), vegetarian with eggs

and dairy products (6.29%), vegetarian (4%), and keto diet (1.43%). Some participants use more than one type of
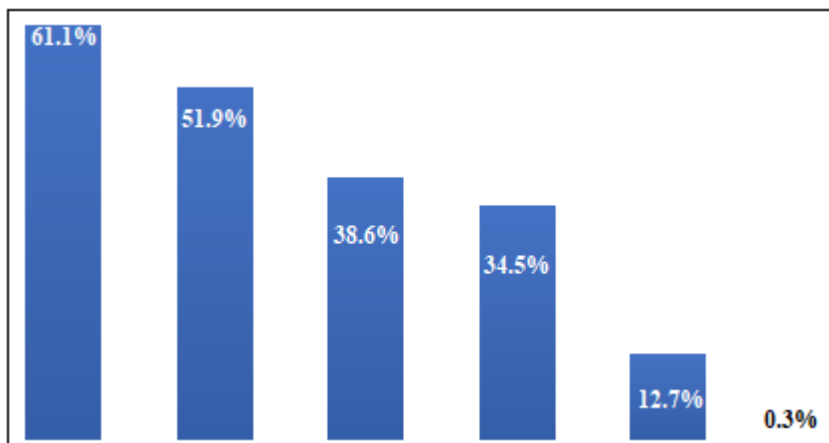
weight control diet.

Figure 2: The most used social media app

Figure (2) shows that the SM application TikTok is the most commonly used app by the participants in this study (61.1%), followed by snapchat (51.9%), then Instagram (38.6%), YouTube (34.5%), Twitter (12.7%) and the least is Facebook (0.3%).

Table 4: The descriptive information of eating disorders (N=316)

Statements
1) Has your shape or weight influenced how you think or judge yourself?
2) How often do you feel uncomfortable seeing your body (e. g., seeing yourself in the mirror, a window reflection, etc.)?
3) I try to avoid eating in front of others
4) I am aware of the calorie content of foods that I eat I eat until I am uncomfortable full
5) I force myself to vomit after eating large meals
6) I often think about food, my weight, weight loss, exercise, etc.
7) I take diet pills, laxatives, or diuretics to help control my weight I often make comments about being "fat"
8) I have an intense fear of gaining weight
9) I particularly avoid food with high carbohydrate content (i. e., bread, rice, potatoes, etc.)
10) I am occupied with a desire to be thinner I like my stomach to be empty
11) I Exercises more than 60 minutes a day to lose or control my weight
12) I feel uncomfortable seeing other body shape or weight in social media (TikTok, Snapchat, Instagram. etc.)
13) I wear loose fitting clothes to hide my body after seeing body shape or weight in social media (TikTok, Snapchat, Instagram. etc)
14) I avoid eating when I am hungry after seeing body shape or weight in social media (TikTok, Snapchat, Instagram. etc)

Table (4) include the 17 items used to measure the ED level by the 4-point Likert scale from (0= Never) to (Nearly all the time=3), the higher score indicates a negative eating habit. In term of the distribution of ED level, 67.41% had low ED, followed by moderate ED level (25.63%), then high ED level (6.96%), see Figure (3).
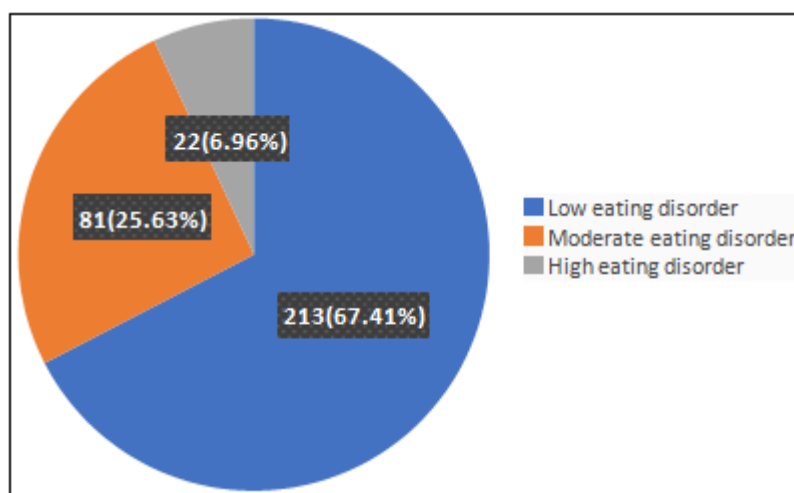
		Eating disorders					P value
		N	%	N	%	N	%
*≤0.05; **≤0.01; *** ≤0.001							

overweight (12.24%), then normal (6.51%), and none of underweight had high level of eating disorder, the same trend of the results were shown in moderate level, there were 44.12%, 28.57%23.67% and 18.75% respectively, on the other hand the underweight had the highest rate of low level ED (81.25%), followed by normal (69.82%), then overweight (59.18%) and finally obese (41.18%), see Table (4).
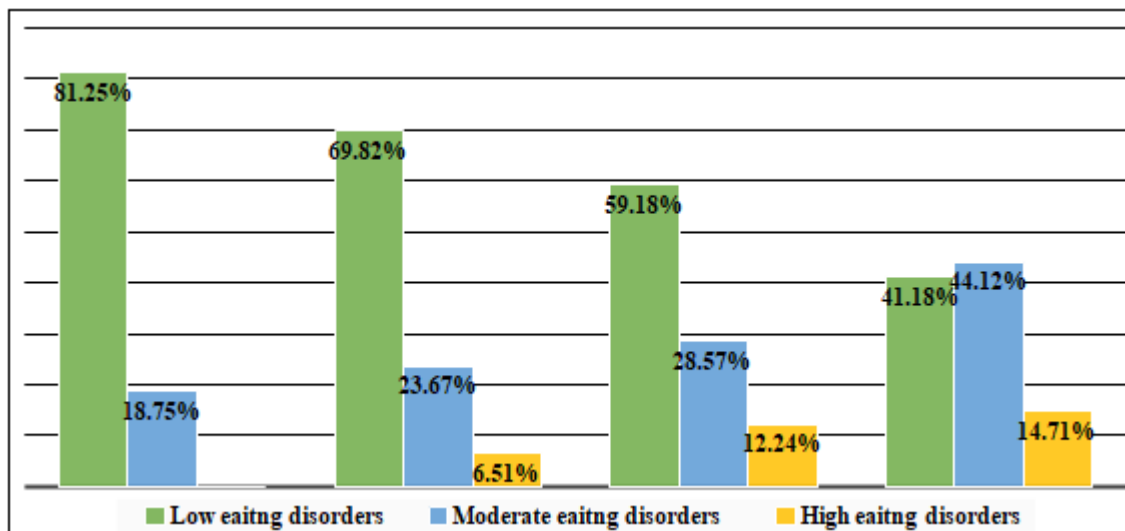
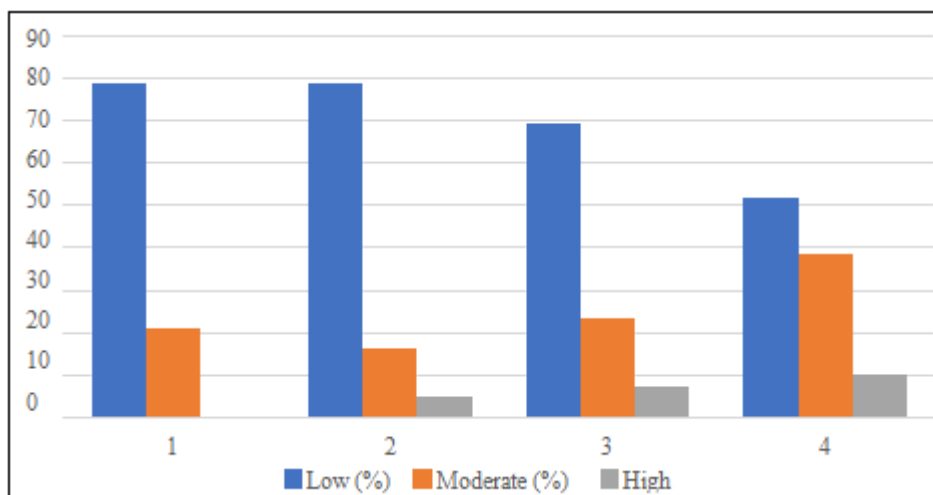|		Eating disorders					P value
		N	%	N	%	N	%
*≤0.05; **≤0.01; *** ≤0.001							

Figure 3: The distribution of eating disorders levels across Time spent on social media

5. Discussion

In this commentary, we want to determine if the use of different SM platforms increases the risk of ED among teenagers and young adults in Saudi Arabia.350 participants have completed the electronic questionnaire, 34 of them claimed that they have chronic disease so they are excluded from the data analysis (table 2). The majority of the participants (87.14%) are females (table1). It is well known that ED are much more common in young females so many studies on ED are done on females only. On an ED examination-questionnaire, female participants reported a higher global score, alongside significantly higher scores on the restraint, shape concern and weight concern subscales than males, suggesting that females in Saudi Arabia may experience overall more severe symptoms than males. (1). In

our study although the questionnaire was distributed randomly but most of the respondents are females, this might have a positive effect on the study as it focus on the group more commonly affected.

The majority of the participants age between 17 and 22 years (72.7%) which is the age at which the different types of ED have the highest incidence.

Regarding the BMI of the participants in our study, table1shows that slightly more than half are normal (52.57%), 19.7% are underweight while 16% and 11.7% are overweight and obese respectively. Saudi Arabia currently has one of the highest prevalence rates of excess weight (2), and he results in this study are nearly similar to that found in study done by Mona Al-Bisher and Hala Al-Otaibi in Saudi Arabia (23) but it is different from that done in Turkey by Kalkan I in which he reported that about 70% of the participant have normal BMI and lower rate of both underweight (11%) and those above the normal (18%).

This study revealed that 28.8% of the participants spend more than 8 hours/day on SM and more than two thirds of the participants spend an average of 4 hours or more/ day on SM. Study done by Kalkan I showed that using SM for more than two hours daily increases the risk of developing eating concerns, which is an early sign of developing and ED (24). This result shows much more time spent by participants than that found by Jiotsa B. Who stated that 80% of the participants spend 1 – 5 hours on SM (25).

More than one third of the participants in our study (35, 43%) reported that they follow certain diets, this is a bit higher than that stated in some studies done in different areas (figure 1) (26).

In the present study we found that the SM application that most commonly used by the participants is TikTok followed by Snapchat, Instagram and You tube respectively while Twitter is used at a lower rate and minimal number use Facebook. There is no big difference between these findings and what is reported in Saudi Arabia SM statistics 2023 in which the SM most commonly used by Saudi population are WhatsApp, Instagram, Snapchat, Twitter and TikTok respectively with little difference between them. WhatsApp is not included in our study as we focused on certain age group who focus mainly on applications that contains more images and advertisements related to the subject we study (SAUDI ARABIA SOCIAL MEDIA STATISTICS, 2023). Peer-reviewed articles on Social Networking Sites (SNS) use and body image and ED revealed that 20 articles demonstrated the negative impact of the use of SNSs and its association with problems in body image and disordered eating; especially those include viewing and uploading photos and seeking negative feedback via status updates. In comparison with another study done in Saudi Arabia, Instagram had more endorsement as a favorite source for nutritional information and diet and healthy recipes were the most interesting nutritional topics. Moreover, the study disclosed the risk factors for suffering from ED, most notably, interaction with and attraction to advertising on SM, which is offered by influencers and celebrities (24).

According to the features shown in table 4 the score is calculated for each participant as explained in the methods. According to this score the participants are divided as having high score (70% or more), moderate score (50%-< 70%) or low score (< 50%). The higher the score the more likely that the participant is having negative eating habits which points to the possibility of having an ED.

By comparing the ED score with the BMI it is evident that there is a significant positive association between ED and BMI (p<0.01), people with higher BMI had higher score of ED. Although we expect that underweight individuals are likely to have ED but in our study, the underweight participants showed a higher rate of low score ED and none of them is in the category of high score (table 5, fig.4). Many studies showed that obese people have more tendency to develop ED; study done in China identified strong positive significant association between BMI and ED, and it states that adolescents who have extreme body size are at increased risk for unhealthy weight control concerns and behaviors. The same study showed that underweight participants have a lower rate of negative eating habits and unhealthy weight control behaviors (27). In another study, the main finding is that BMI and body dissatisfaction are significantly associated with ED pathology. These results support our study data, regarding the association between BMI and ED (28).

This study confirmed the positive and significant correlation between ED and the time spent on SM (p<0.01) table 6, figure 5. Participants with higher time spent on SM had higher ED score, 9.89% of those who spend > 8 hours on SM have a high score of ED compared to 0% of those who spend < 2 hours. On the other hand, those who spend < 2 hours a day on SM have the highest rate of low ED score (78.95) compared to those who spend >8 hours a day (51.65%). Many studies done in Saudi Arabia showed similar results. One study done among adolescents and young adults (18 – 30 years age) showed that 71% of the participants consider personal accounts of dietitians and nutritionists as the favorite source for nutritional information, particularly those who suffered from high ED concerns (82.8%) (23). Another study done in Australia showed a clear pattern of association between SM usage and disordered eating cognitions and behaviors. It also stated that a greater number of SM accounts is associated with higher disordered eating scores for both cognitions and behaviors (29).

6. Conclusion

This study revealed the highly significant association between the time spent on SM applications and the development of ED among adolescents and young adults. This raises the importance of increasing the attention and awareness of individuals, families and the whole community about the excessive use of SM especially among this age group.

7. Future Scope

Given that there is a significant correlation between the use of social media and eating disorders, we may be able to

address this problem by first understanding the negative effects of SM use, which can be accomplished by using SM less frequently or by boosting self-confidence, which is a key factor in developing any type of ED. The severity of the hazardous ED (anorexia nervosa) should be recognized, as well as the many forms of EDs. Finally, improving the findings of the study may be done through awareness lectures at schools and colleges or another additional place where teenagers and young adults are present. Also, SM itself needs to take part in this plan by emphasizing the seriousness of EDs or simply by recommending for less time spent on SM platforms.

Contributors:

1) Maha M Alrasheedi: participated in preparation of the questionnaire, data collection and introduction writing.
2) Mada O Alshammari: participated in preparation of the questionnaire, data collection and results writing.
3) Supervision and guidance in all the research steps, discussion writing and general organization of the manuscript before submission.

Disclosure and potential conflict of interest

There are no conflicts of interest.

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