



Social Connection and Self-perceived Depression Among Adolescents: A Path Analytic Model for Abu Dhabi

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Abstract

We examined how family and friendship connections of adolescents (15–19 years old) interrelate and how these interactions affect their self-perceived depression and stress. The data were collected through the Abu Dhabi Quality of Life Survey in 2018, which was completed by more than 51,000 respondents. Nine hundred and fifty-eight out of 3356 adolescents in the survey self-identified themselves as depressed. We developed a structural equation path model to explicate the relationships among the variables hypothesized to affect adolescents' self-reported depression. The results produced an excellent fit of statistics of the model to the data. In general, social connections and relationships with family and friends directly affected adolescents' self-perceived depressive feelings. More specifically, variables such as “often feeling isolated from people,” “the amount of quality time spent with family,” “the frequency of meeting with friends, relatives or colleagues,” and “involvement in informal activities with friends” had the greatest total effects on adolescents' self-perceived depression. “The amount of quality time spent with family” also exerted indirect influence on feelings of isolation. Involvement in sports groups, involvement in religious and spiritual groups, and generalized trust did not exhibit any direct influence but had an indirect impact on self-perceived depression. The findings could contribute to the current understanding of theories of depression and yield implications for social policy, social service, and social work interventions for school-aged adolescents in Abu Dhabi.

Keywords Self-perceived depression · Social connection · Adolescents · Abu Dhabi · Path analysis

Highlights

- Adolescents' self-perceived depression could be caused by a combination of direct and indirect factors.
- All social connection variables exerted direct and significant effects on adolescents' self-perceived depression.
- Feeling isolated or lonely had the highest direct total effect on teenagers' feeling of depression.
- Trust in people had indirect effects on adolescents' self-perceived depression through three variables: “feeling isolated,” “satisfaction with family life,” and “quality time with family.”

Depression during adolescence is a common problem in many societies (Fiorilli et al. 2019; Kirmayer et al. 2017). A high proportion of school-aged children typically experience poor mental health, as they often show signs of feeling sad and hopeless (Robinson et al. 2010). While analysts have attributed adolescent depression to

many interlinked factors (Thapar et al. 2012), interpersonal and social relationships are often regarded as the most important predictor of adolescent psychosocial wellbeing (Clayborne et al. 2019; Landstedt et al. 2015). Positive social relationships with family and friends help adolescents to cope with stress and can be used to predict their mental health (Kern et al. 2014; Paradis et al. 2011).

In the Arab world, little is known about the mental health of youth (Hamdan-Mansour & Wardam 2009). According to the World Health Organization (2017), the United Arab Emirates (UAE) had among the highest regional levels of depression in the Eastern Mediterranean Region, at 5.1% of

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the population. A study in the UAE found that 40% of the adolescents who underwent a psychiatric diagnosis in primary care clinics were diagnosed with depression (Eapen & Ghubash 2004).

It should be noted that the UAE has unique social and cultural characteristics. Traditionally, the UAE as an Arab country is characterized by tribe-based loyalty, intensive familial ties, and strong religious bonds. However, fast-paced socioeconomic transformation has occurred in recent decades. Family dynamics have seen declining internal cohesion in the time of globalization, as the young generations spend more time in using communication technologies (Sabban & Mohamad 2014). Young people's increasing dependency on the Internet and social media has tended to result in less affectionate social interactions, less quality time with their family and friends, a weakening ability to study and concentrate in class, and more exposure to online games, violence, and bullying, which negatively affect the mental health of youth (Abaido 2020).

More specifically in the context of the Emirate of Abu Dhabi of the UAE, only 19.0% of the total population are Emirati citizens. The non-citizen population, coming from all over the world with different cultural and ethnic backgrounds, comprise 81.0% of the total resident population (Statistic Center Abu Dhabi 2020). A large percentage of non-citizens are individuals working in various sectors of the economy and living without their families in Abu Dhabi. Expatriate adolescents in Abu Dhabi thus are likely to have a relatively small family circle around them. Abu Dhabi is a multi-cultural society, where the fast pace of social transformation and the unique demographic and family characteristics of the society have together formed a social milieu in which adolescents develop their identity and social bonds (Yang et al. 2021). To what extent these social structures and forces influence adolescents' mental health deserves research attention.

A proper understanding of the factors that contribute to depression among Abu Dhabi youth is necessary and can provide recommendations for policies and programs to enhance the well-being of adolescents. This specific research attempts to address the issue of self-perceived depression and its correlates among adolescents aged 15–19 in Abu Dhabi. We examine how the family and friendship connections of adolescents and other social factors interrelate, and how these interactions affect their self-perceived depression and stress. The main factors in the model include satisfaction with family life and consecutiveness, relationships and social involvements with friends, participation in social activities and groups, and certain mental and spiritual feelings.

Theoretical Background

Depression is generally triggered by one or more negative life events involving stress, loss, or disappointment, and reinforced by difficulties in family relationships or friendships, long-term problems at school, and certain personality traits (Kelvin 2016). As far as adolescents are concerned, Twenge et al. (2019) research illustrated a cohort effect on teenagers' self-reported depressed mood, indicating systemic causes. Nevertheless, research evidence strongly suggests that individuals with strong social support systems are better at coping with stressful life events and overcoming psychological problems (Callaghan & Morrissey 1993). Bouteyre et al. (2007) recognized the effect of social support and connections, especially during early childhood. Murshid's (2017) investigation of the association between social support networks, as measured by parental involvement and close friendships, and depression among adolescents in South Asia demonstrated that social support was a social determinant of adolescent mental health. Stronger social support can result in children experiencing less anxiety, behavioral problems, and depressive symptoms (Alsubaie et al. 2019; Saei Ghare Naz et al. 2020). On the other hand, less social support negatively affects the levels of resilience, which is important in preventing depressive symptoms.

Based on relevant theories and previous research, a theoretical formulation has been developed, linking several social connection-related endogenous and exogenous variables to adolescents' self-perceived depression. The following literature review supports the hypothesized relationships of the model.

Young People and Depression

Several researchers have documented that a substantial number of school-aged individuals in the general population suffer from depression. Kaplan et al. (1984) reported that 9% of a sample of high school students were experiencing moderate or severe depression. Recent US data indicated that between 2005 and 2017, the percentage of teens aged 12–17 who had reported the symptoms of a major depressive episode had risen from 8.7 to 13.2% (Twenge et al. 2019). Kashani et al. (1989) investigated depressive symptoms in three different age groups of children and young people and found that depression scores increased as age increased, with means of 4.71 for the 8-year-olds, 4.93 for the 12-year-olds, and 6.23 for the 17-year-olds. These justify the importance of examining the mental health of adolescents in Abu Dhabi.

The Parent and Family Dimension

In recent years, an increasing amount of research has identified various parenting dimensions pertinent to depression among adolescents. Many researchers have identified relationships between self-evaluation and parental support as predictors of depression (Simons & Miller 1987; Robertson & Simons 1989). Liu and Merritt's (2018) recent findings suggested that the associations between parenting and childhood depression were generally small to moderate but non-trivial.

Research findings point to a direct relationship between the nature of parental communication and depression. The relationship between communication with parents and other members of the family and depression has been demonstrated to be significant in many studies (Subramanyam et al. 2019). Demo et al. (1987) found a positive relationship between the nature of communication and self-esteem in a sample of 139 adolescents. In an effort to understand how changes in family cohesion during the high school to college transition may be related to changes in depressive symptoms, Joao et al. (2015) discovered that students who reported increases in family cohesion reported declines in depressive symptoms during the college transition. Therefore, this present research predicts a significant relationship between social support and connections and adolescents' self-perceived depression.

Trust in Others and Depression

Several studies have illustrated that individuals who are mistrustful of others are shy and nervous in relation to others, sensitive to rejection, and more likely to report higher levels of depression and distress (Guterman & Jayaratne 1994; Sharp et al. 2011). Chena et al. (2017) noted that negative trust may be the factor which made people vulnerable to depression. Individuals who hold negative trust beliefs typically develop signs of depression and take precautions to protect themselves (Evans & Krueger 2011). Another study reported that negative trust appeared to be an independent risk factor for long-term depression (Kim et al. 2012). While numerous studies dealing with depression identify trust as a significant factor (Fujiwara & Kawachi 2008; Lee et al. 2005; Wang et al. 2008), it has yet to be examined whether adolescent depression affects interpersonal trust.

Loneliness and Depression

The correlation between loneliness and depression has been widely reported (Brage et al. 1993; Woodward 1988). Research suggests that a significant portion of

adolescents experience feelings of isolation and loneliness (Asher et al. 1990). A study by Anderson and Harvey (1988) documented that depression was significantly associated with loneliness among college students. However, while most research has examined depression among adolescents, few research has examined the causes of school students' loneliness and low self-esteem in relation to depression (Goswick & Jones 1981). School students can experience high levels of social contact but still feel lonely due to cognitive discrepancies between the desired quality of their relationships and their actual experiences (Richardson et al. 2017). Some researchers thus have focused on the quality of social contact that is most useful for understanding loneliness (Lodder et al. 2017; Masi et al. 2011). In this regard, Moeller and Seehuus (2019) found that verbal social skills played an important role in students' experiences of loneliness as well as depression and anxiety.

Physical Activity and Depression

Research findings have been mixed in relation to the correlation between depression and the physical activity levels of adolescents (Gunnell et al. 2016; Zahl et al. 2017). Nevertheless, some recent studies found that minimal participation in physical activity was associated with anxiety and depression, as those with 0 days per week of physical activity were about twice as likely to have anxiety (Zhua et al. 2019). Long et al. (2019) revealed that weekly exercise was an effective treatment for mild to moderate depression among adolescents aged 6 to 17 years. Some studies have also examined lifestyle changes that can aid in mitigating adolescents' depressive symptoms. For example, increasing one's physical activity regiment has been found to be effective in reducing depression for both adolescents and adults (Josefsson et al. 2014).

Religious Belonging, Social Groups, and Depression

Some researchers suggest that religious involvement generally promotes mental health (Koenig 2012; Schnittker 2019). Some refer to the social support available in religious organizations (Idler et al. 2009). In general, however, the empirical evidence has uncovered few significant contingencies in the relationship between religion and depression, as those with some religious affiliation tend to report better mental health (Sterthal et al. 2010). Some analysts characterize religion as a double-edged sword that can provide significant social benefits but can also increase depression depending on specific religious beliefs (Silton et al. 2014).

Participation in different social groups, such as volunteer groups, sports groups, or heritage groups, has also been found to be negatively correlated with school-aged depression (Kearns et al. 2011). Research has cited many positive outcomes of volunteering which include benefits for both mental and physical health and overall psychological well-being, improved mood, and reduced stress and anxiety (Rochester et al. 2010). Additional benefits include the development of a solid support system through regular contact with others, which subsequently protects individuals against depression (Librett et al. 2005).

Biographical Variables and Depression

Biographical variables such as gender and age affect depression. Researchers have found that depression occurs more often in females (Baron & Perron 1986; Shapiro 1988). Deb et al. (2015) revealed that 63.5% of the higher secondary students in Kolkata experienced academic depression and stress and that it was higher among females than males. Joao et al. (2015) found that changes in family cohesion were only related to changes in depression for girls. Regarding age, Kashani et al. (1989) found that depression was positively correlated with age. On the other hand, Woodward (1988) showed a significant negative relationship between age and loneliness.

Based on the literature presented here, it is hypothesized that although many factors could affect school-aged depression, the most significant factors affecting the self-perceived depression of adolescents would come from students' social connections dimension when a comprehensive model is applied. It should be further noted that the extensive literature review confirms that few studies have addressed the depression of school-aged adolescents in Abu Dhabi. Conducting research on the depressive features of school-aged students may enable a better understanding of the nature of their social lives in relation to social connections with family, friends, and other people. The general purpose of this research is to analyze the relationships and interactions between social support and connections and students' self-perceived depression using an overall structural model.

Method

Study Instrument and Procedures

Data used in this research were collected through the Abu Dhabi Quality of Life Survey conducted by the Abu Dhabi Department of Community Development in 2018. Through advertisements on the Abu Dhabi Department of Community Development's website and local press releases, all Abu Dhabi residents including adolescents were invited to

participate in this online survey. The Abu Dhabi Department of Education and Knowledge also sent the survey link to all students above 15 years old in its schools. As a required step, parents were contacted to seek their permission for their children to participate in the survey.

The survey instrument consisted of 14 dimensions of wellbeing-related items, including housing, household income and wealth, employment and earnings, work-life balance, health, education, personal safety and security, social connections, civic engagement and governance, environment, social and cultural values, social and community services, subjective wellbeing, and access to information. It should be noted that the current study included variables from all 14 dimensions in its overall analysis. After further analysis, the variables that remained in the model were related to social connections, health, community engagement, and social and cultural values.

Regarding depression, the Abu Dhabi Quality of Life Survey asked respondents "during the past four weeks, how often did you feel downhearted and depressed?" A five-point Likert scale from "never" to "always" was used. Those who marked "4" (often) or "5" (always) were considered to be associated with self-perceived depression. The following questions in the survey also used a five-point scale: "how often have you felt isolated from people around you?;" "amount of quality time spent with family?;" "in general, I am satisfied with my family life?;" "extent of involvement in sport groups?;" "extent of involvement in informal activities with friends?;" "extent of involvement in heritage groups?;" "extent of involvement in religious/spiritual groups?;" "how often do you meet socially with friends, relatives or colleagues?;" and "generally speaking, do you agree that most people can be trusted?"

Participants

Three thousand three hundred and fifty-six students aged between 15 and 19 participated in the survey, of whom 958 identified themselves as "often/always downhearted or depressed." This group consisted of 333 (34.8%) boys and 625 (65.2%) girls. About 36.6% were UAE nationals, and the rest were of more than 58 other nationalities from all over the world. Abu Dhabi consists of three regions, which have different physical and social characteristics. Five hundred and eighty-three students came from Abu Dhabi region (60.9%), 324 students from Al Ain region (33.8%), and 51 students from Al Dhafra region (5.3%) (Table 1).

Data Analysis

Since different items in the survey used different scales, the data were standardized before further analysis was performed. This step was necessary to make the data more

accountable for computational aspects and interpretations when different scales were used (Langenberg 2005). An initial analysis was performed to reduce the variables affecting the self-perceived depression of teenagers. The initial analysis included individual correlation analysis and multiple regression to understand the magnitude and direction of individual relationships between the factors. A step-by-step path analysis was employed. At every step, one individual variable was introduced. For all instances, the self-perceived depression variable was treated as the primary focus of the analysis. When considering a variable, three basic statistical values were used: the magnitude of the standardized coefficient, the t-statistics, and the level of significance. Variables that did not reflect any significance were eliminated from further consideration.

The path analysis aims to yield a path model and to estimate effects to uncover the pattern of associations between self-perceived depression and other factors. For the path analysis, several fit statistics were used, as suggested by many researchers (Chen 2007; Schumacker & Lomax 2004). Degrees of Freedom (DF) associated with the Maximum Likelihood Ratio Chi-Square (MLRCS) are the main criteria for judging a path model. Root Mean Square Error of Approximation (RMSEA) is an index of the difference between the observed covariance matrix per degree of freedom and the hypothesized covariance matrix which denotes the model. RMSEA takes the model complexity into account, as it reflects the degree of freedom as well. When the

RMSEA value is smaller than 0.05, it may indicate a convergence fit to the analyzed data of the model. When it produces a value between 0.05 and 0.08, it indicates a fit which is close to good. The Comparative Fit Index (CFI), Normed Fit Index (NFI), Non Normed Fit Index (NNFI), Parsimony Normed Fit Index (PNFI), Goodness of Fit Index (GFI), and Adjusted Goodness of Fit Index (AGFI) produce values between 0 and 1, and high values are indicators of good fit. When their value is 0.90, it means that the fit in question is better compared to the independence model (Schermelleh-Engel & Moosbrugger 2003). Root Mean Square Residual (RMR) is the square root of the difference between the residuals of the sample covariance matrix and the hypothesized covariance model. Values as high as 0.08 are deemed acceptable (Hu & Bentler 1999).

In the final path analysis, for individual variables all significant relations were considered and included in the model. The final path analysis model was identified as the best fit model given all fit statistics. Since LISREL was used in building the final model, several options in the software were utilized to arrive at the final model. The model only contained paths that were significant, as all insignificant paths were removed from the final model. The software suggested adding new paths that would increase the fit of the model. A step-by-step analysis using this feature was conducted. This analysis provides estimates of decreases in chi-square if new paths are added. Another option is suggestions for adding error covariance between variables. The software also indicated largest negative standardized residuals between selected variables. As a result, many variables were eliminated from further analysis. The covariance matrix of variables in the model is presented in Table 2.

Results

The data analytical process required several steps. After several iterations, a total of 10 variables related to different

Table 1 Description of school-aged sample

Gender	Male	Female	
	333 (34.8%)	625 (65.2%)	
Region	Abu Dhabi	Al Ain	Al Dhafra
	583 (60.9%)	324 (33.8%)	51 (5.3%)
Nationality	UAE	Others	
	350 (36.6%)	608 (63.4%)	

Table 2 The covariance matrix of the final variables in the path model

Items	HLTH83	SCON8	SCON9	SCON11	SCON51	SCON54	SCON56	SCON57	SCON6	SCON7
HLTH83	0.838									
SCON8	0.196	0.756								
SCON9	-0.061	-0.052	0.41							
SCON11	-0.089	-0.175	0.165	0.737						
SCON51	-0.049	-0.118	0.131	0.109	0.712					
SCON54	-0.074	-0.201	0.115	0.113	0.309	0.912				
SCON56	0.028	-0.085	0.14	0.181	0.315	0.346	0.903			
SCON57	-0.014	-0.034	0.078	0.129	0.232	0.229	0.417	0.615		
SCON6	0.051	-0.180	0.062	0.067	0.198	0.276	0.186	0.120	0.912	
SCON7	-0.036	-0.131	0.057	0.011	0.033	0.072	0.082	0.096	0.103	0.947

Table 3 Descriptive features of the variables in the model

Variable	Description	Scales (1 to 5)	Mean	Sd.
HLTH83	Feeling downhearted and depressed	From 1 (never) to 5 (always)	4.351	0.477
SCON8	Feeling isolated from people around	From 1 (none of the time) to 5 (all of the time)	3.091	1.267
SCON9	Amount of quality time spent with family	From 1 (a very short amount of quality time) to 5 (a large amount of quality time)	2.972	1.363
SCON11	Satisfaction with family life	From 1 (strongly disagree) to 5 (strongly agree)	3.889	1.201
SCON51	Involvement in sport groups	From 1 (not involved at all) to 5 (very high involvement)	2.767	1.496
SCON54	Involvement in informal activities with friends	From 1 (not involved at all) to 5 (very high involvement)	3.618	1.327
SCON56	Involvement in heritage groups	From 1 (not involved at all) to 5 (very high involvement)	2.363	1.424
SCON57	Involvement in religious/spiritual groups	From 1 (not involved at all) to 5 (very high involvement)	2.662	1.491
SCON6	Meeting socially with friends, relatives or colleagues	From 1 (no recent contact) to 6 (every day)	4.100	1.821
SCON7	Most people can be trusted	From 1 (strongly disagree) to 5 (strongly agree)	2.393	1.151

Table 4 Statistical measures of the final path model

Degrees of freedom	12
Maximum Likelihood Ratio Chi-Square	24.521 (P = 0.0173)
Root Mean Square Error of Approximation (RMSEA)	0.02301
Normed Fit Index (NFI)	0.991
Non-Normed Fit Index (NNFI)	0.983
Parsimony Normed Fit Index (PNFI)	0.264
Comparative Fit Index (CFI)	0.996
Root Mean Square Residual (RMR)	0.00923
Standardized RMR	0.0128
Goodness of Fit Index (GFI)	0.998
Adjusted Goodness of Fit Index (AGFI)	0.989

modules remained in the path model. Table 3 shows the final list of variables remaining in the final path model, with their associated means and standard deviations. Table 4 presents the final fit statistics obtained. The value of MLRCS divided by DF is 1.88, which provides information concerning the fit between the data and model. With a smaller index value, the consistency is better. As stated by Schermelleh-Engel and Moosbrugger (2003), a good fit between data and model is indicated when the ratio has a value of 2 or smaller, and an acceptable fit when it produces a value of 3.

Figure 1 depicts the final path model. The model shows the arrow directions, standardized coefficients, and the associated t-statistics. The figure portrays the decomposition of correlations as different pieces to enable the interpretation of effects (both direct and indirect). The diagram contains the independent, intermediate, and dependent variables. The coefficients shown are standardized betas, illustrating the direct effect of an independent variable on a dependent variable in the path model.

As shown in Fig. 1, the center point is the variable denoted as “feeling downhearted and depressed.” A total of six variables exert significant direct effects on students’ self-perceived depression. “Feeling isolated from people around” has a direct positive effect on “feeling downhearted and depressed” with a coefficient of 0.26, “amount of quality time with family” with a coefficient of -0.13 , “satisfaction with family life” with a coefficient of -0.05 , “involvement in informal activities with friends” with a coefficient of -0.07 , “meeting socially with friends, relatives, or colleagues” with a coefficient of 0.12, and “involvement in heritage groups” with a coefficient of 0.09.

Table 5 shows the direct and indirect effects of all exogenous items in the model on the dependent variable. In Fig. 1, it is clear that a variable may not have a direct effect, but it may have an indirect effect. The results in Table 5 show that the highest total effect of 0.27 is associated with “feeling isolated from people around.” With a total score of 0.22, “amount of quality time spent with family” scores the second highest total effect. Other high total scores are associated with “meeting with friends, relatives or colleagues” (0.16), “involvement in informal activities with friends” (0.12), and “involvement in heritage groups” (0.11). Almost all variables that exert direct influences on self-perceived depression also have indirect effects through other variables.

Figure 1 illustrates that the largest coefficient (-0.5961) is associated with the effect of “most people can be trusted” on “satisfaction with family life.” The second largest coefficient of 0.334 is associated with the influence of “quality time with family” on “feeling isolated.”

Discussions

The results of this present study confirmed that adolescents’ self-perceived depression could be caused by a combination of

Fig. 1 The final path model (feeling depressed) – standardized coefficients and t-values

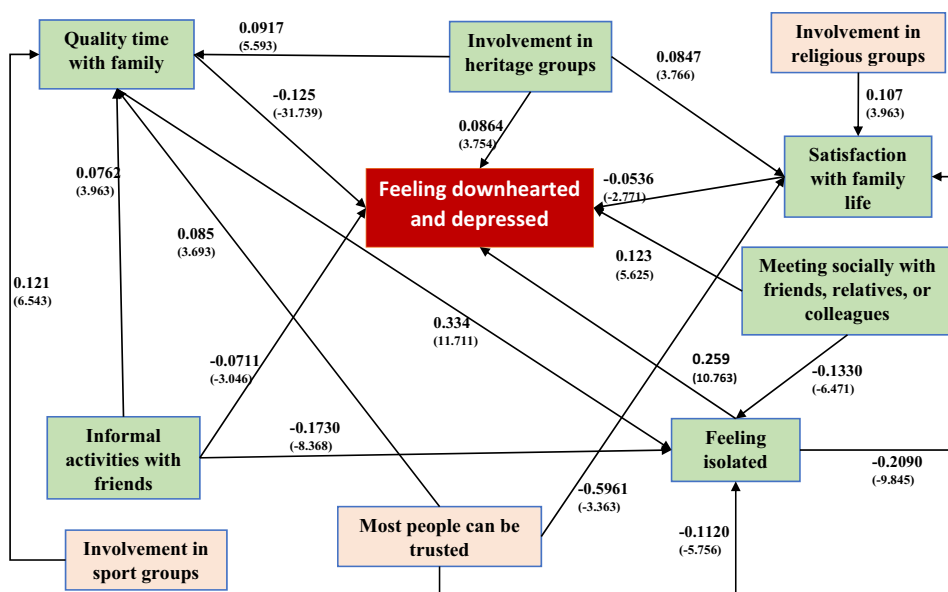


Table 5 Direct, indirect and total effects of variables on school-aged children depression

Variables	Direct effect	Indirect effect	Total effect
Often feeling isolated from people around me	0.2591	0.0112	0.2702
Amount of quality time spent with family	0.1233	0.0945	0.2175
In general, I am satisfied with my family life	0.0536	–	0.0536
Involvement in sport groups	–	0.0615	0.0615
Involvement in informal with friends	0.0711	0.0474	0.1185
Involvement in heritage groups	0.0864	0.0196	0.1060
Involvement in religious/spiritual groups	–	0.0057	0.0057
Often meeting with friends, relatives or colleagues	0.1230	0.0329	0.1559
Generally speaking, most people could be trusted	–	0.0184	0.0184

direct and indirect factors that relate to family connections and relationships, formal and informal connections with friends, activities with certain groups in the community, feeling isolated, physical health, and overall propensity to trust others.

Feeling isolated or lonely occupied the top spot as a significant factor in teenagers’ feelings of depression, as it generated the highest direct and total effects on self-perceived depression. The results of this study clearly indicate that many adolescents understand the concept of loneliness and report feeling lonely and isolated. This research goes further to demonstrate that several specific factors contribute to feelings of isolation and loneliness among school-aged adolescents. The three most obvious factors are generalized trust, involvement in informal activities with friends, and quality of time with family. It is clear that some of these significant factors occur at home or outside of school settings, but equally important are the factors that occur within school settings.

All four social connection variables exerted direct and significant effects on self-perceived depression. Students

with better family relations reported less psychological distress and feelings of depression. The results of the study also show that social connections with relatives and friends appear to have the same effect on adolescents’ wellbeing by causing them to feel less depressed and downhearted. Moreover, “involvement in informal activities with friends” affected “quality of time with family” in a positive manner. This is consistent with other similar studies that focus on the significance of social connections reflected by individuals’ relations with family and friends (Liu & Merritt 2018; Papini & Roggman 1992; Robertson & Simons 1989).

Family relations have been identified as a major contributor to the development of a sense of coherence by providing meaningful experiences among adolescents. Thus, family social interactions indeed appear to be an important predictor of well-being (Miller et al. 2009). The present study thus strengthens the notion that family is a social system which provides a context for development (Henry et al. 2015). Such a social system could play a major role in shaping the lives of individuals, including

adolescents (Farley & Kim-Spoon 2014; Kim-Cohen & Turkewitz 2012; Masten & Monn 2015). It seems worthwhile to strengthen families, especially parents, in gaining and maintaining a nurturing and benevolent togetherness, in which belonging, cohesion, and trust are addressed (Grenvstein et al. 2019; Kirby 2016; Yang et al. 2021).

This research suggests that physical activities could influence adolescents' feelings of depression in a positive way. In fact, the results show that participation in physical activities (involvement in or being a member of sports groups) was associated with self-perceived depression indirectly through "quality time with family." In general, such results are consistent with other similar empirical work (Schuch et al. 2017; Zhua et al. 2019).

Another interesting outcome of this study is that the trust that school-aged teenagers have in other people had indirect effects on their self-perceived depression through effects on three variables: "feeling isolated," "satisfaction with family life," and "quality time with family." The significance of trust as a factor in adolescents' depression is also indicated by others (Lee et al. 2005; Wang et al. 2008).

The indirect effect of "involvement in religious groups" is also noticeable. Being a member of a religious group positively affected adolescents' satisfaction with family life. Family's religious involvement could benefit children and youth in many ways. Numerous studies have shown that religiosity in parents and youth offers a variety of protective factors for adolescents (Brody et al. 1996; King 2010; Mahoney 2010). Youth who are members of a religious group and frequently attend religious services are more likely to be influenced by the religious or cultural values that emphasize the importance of family relationships (Wilcox 2002). In the UAE as a Muslim country in particular, teenagers often attend worships and religious services together with their family members, which helps foster family cohesion and strengthen family relationships (King et al. 2013). Such positive social benefits partially support the results found in other studies that had adults as samples (Silton et al. 2014).

Taken together, the current research highlights the multidimensional structures and features, especially in terms of social connections and relationships, in the understanding of self-perceived depression among adolescents.

Implications and Future Directions

Mental health programs should be delivered at the early stage of individuals' development. As Frederick Douglass, an American social reformer and statesman, observed: "It is easier to build strong children than to repair broken men." Offering mental health programs within the school setting is not only beneficial but imperative as well, as suggested by this present study. The school provides a universal platform

from which formal mental health services can be delivered to adolescents who otherwise would not easily be able to access these (Kratochwill & Shernoff 2003). Another advantage for school-based mental health programs is that students receiving interventions in school are more likely than children receiving interventions in a clinical setting to continue treatment and receive appropriate support (Kazdin et al. 1997). Research has shown that both mental health and academic success can be promoted through social and emotional learning in the classroom (Merrell & Gueldner 2010).

School-based mental health programs also facilitate targeted early interventions (Middlebrooks & Audage 2008) and promote positive mental health development for all adolescents, not only those who are at risk of school-based depression and self-harm (Rowling & Weist 2004). In addition, mentoring programs and role-modeling displayed by peers who are resilient and who display good behaviors and a positive attitude may promote these characteristics in those who are less socially and emotionally competent (Lowry-Webster et al. 2001). Furthermore, comprehensive provider-initiated interventions have been shown to be cost effective (Browne et al. 2001). Cost benefits potentially resulting from school-initiated interventions might include fewer referrals of students to special educators and school psychologists. Future research should be undertaken to assist in the identification, development, and implementation of effective interventions that are culturally and contextually relevant, which will help prevent and reduce depression and stress of adolescents in Abu Dhabi.

Future research should consider studying other factors that are cited as significant when studying the depression of adolescents. The Abu Dhabi Quality of Life Survey did not ask certain additional questions that might be important. For example, participants' educational backgrounds including schooling failures, type of school, education track, and student performance may be associated with student's depressive feelings. Moreover, while adolescents in schools learn the norms of competition and accept the idea that it is fair to give different rewards for different levels of achievement, there is growing evidence to suggest that abuse gives rise not only to mood disturbance but also to a variety of other difficulties such as alcoholism and social anxiety (Abaido 2020; Mitchell et al. 2007). The role of socioeconomic status, parenting styles, peer relations, and school factors should not be ignored. Some studies have already demonstrated the effect of the mediating role of family function on the association between mother's education and offspring's depression (Sibo & Guo 2018). The types of sport and the forms of the sport (individual or group) that help more effectively in reducing adolescents' depression and stress should also be explored, so that schools could update their physical education curriculum to

help address adolescents' physical and mental health. Research worldwide also shows the link between teenagers' Internet addiction and exposure to cyberbullying and negative mental feelings such as anxiety and depression (Mitchell et al. 2007). While important, these factors have not been addressed in this research.

There are other limitations to note. While longitudinal studies are more useful to reveal the relationships between depression and various factors (Da Silva et al. 2012; Zahl et al. 2017), the current study utilized single one-time data of adolescents. Furthermore, some of the variable in the path model are based on a single item, which might not accurately reflect these variables. Therefore, future research may employ a more comprehensive structural equation model instead of a simple path analysis where composite items are used to better represent the various dimensions.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Informed Consent Informed consent was obtained from all participants included in the study.

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