Underlying pathway of factors leading to mental health in Iranian young adolescents: A structural equation modeling

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Background: The present study aimed to provide a field-tested model of constituting factors affecting mental health in young Iranian adolescents. **Materials and Methods:** In this cross-sectional study, a conceptual model was proposed based on an extensive literature review. A total of 254 young adolescents aged 11–14 years were recruited from north, south, east, and west regions of Tehran megacity by a random cluster sampling procedure, of whom 244 adolescents participated. The adolescents and their mothers altogether completed eight questionnaires pertaining to the proposed conceptual model: (1) Strengths and Difficulties Questionnaire (SDQ), (2) Childhood Experience of Care and Abuse Questionnaire, (3) Child Exposure to Domestic Violence Scale, (4) Drug Abuse Screening Test-10, (5) Baumrind Parenting Style Questionnaire, (6) Conflict Behavior Questionnaire, (7) General Health Questionnaire-28, and (8) Garmaroodi Socioeconomic Status Questionnaire. The statistical analysis was performed using structural equation modeling. **Results:** This study demonstrated that parent mental health ($b = -0.111$), experience of father's care ($b = -1.112$), conflict with mother ($b = 0.309$), conflict with father ($b = 0.135$), and exposure to domestic violence ($b = 0.217$), as well as age ($b = 0.93$) and gender ($b = 0.139$), had direct effect on adolescent mental health (all $P < 0.05$). Further, the results showed that exposure to domestic violence and conflict with mother had the greatest direct impact on adolescent mental health among all other family-related factors, followed by conflict with father and parent mental health. Conflict with mother and conflict with father also affected adolescent mental health indirectly through experience of domestic violence and had a mediating effect for the influence of several other factors on adolescent mental health, thus playing an important role in the pathway leading to young adolescent mental health status in the Iranian population. **Conclusion:** Overall, the final model proved to be fit and the factors constituting the final model were able to predict 88% of the variations in the mental health of Iranian adolescents. This model can guide clinical psychologists, psychiatrists, and other mental health workers in a more realistic and effective prevention or treatment planning for their young clients. Moreover, it may help in arriving at a comprehensive preventive policymaking for mental health policymakers.

Key words: Adolescent, conflict behavior, domestic violence, mental health, parent drug abuse, parenting, socioeconomic status

INTRODUCTION

Mental health includes psychological, social, and emotional well-being. It affects how we feel, think, and act throughout the life course.[1] It is generally accepted that mental health problems in adolescence have an on-going effect, impacting not only adulthood mental health but also physical health, as well as educational and occupational engagement and enjoyment.[2,3] There is a lot of evidence to show that parental behaviors and attitudes,[4] as well as noxious childhood experiences,[5] increase the risk of behavioral and psychiatric disorders in adulthood. The prevalence of childhood physical and emotional abuse is certainly related to depressive symptoms[6] and has a lifelong effect on the overall mental health.[7] Studies have demonstrated that

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approximately 3%–18% of children and about 10%–25% of adolescents suffer from psychopathologies.[8,9] The prevalence of psychological problems in Iran has been reported to be 6.4%–28.4% in adolescents.[10-12] A cross-sectional study conducted in 1998 showed that more than half of adolescents living in Tehran were suspected of having mental disorders.[13]

Since mental health is influenced by various individual, family, and socioeconomic risks or protective factors[14,15] that can be different in nature or can act and interact differently in different societies,[16] it is essential that these factors and their relationships with each other and ultimately with mental health be exclusively identified in each society. This is the first step in preventive and promotional planning and is especially of utmost importance in the adolescence period when there exists an opportunity to promote mental health and to prevent its disorders.[17,18]

Understanding how these factors correlate with each other, to ultimately affect mental health status in different individuals can enhance our comprehension of the truly complex nature of the underlying causes and the causality network underlying mental health. This will help us avoid underestimation and oversimplification of the etiologic process, and thus to provide realistic and more effective interventional strategies by simultaneously addressing the various factors involved.

Despite numerous researches in the world that have studied the effect or relationship of different variables with mental health,[19-21] no studies in Iran have previously addressed the issue holistically by studying the interconnected and complex network of factors affecting adolescent mental health using the path analysis method. The scarcity of such studies in the world has led us to underestimate the interaction between various factors affecting mental health in our preventive and therapeutic planning and therefore not to apply the best holistic strategies.[22,23]

The present article aims to provide a model constituting some of the factors affecting mental health in young Iranian adolescents and the interactions existing between them. The modeling approach used in this study is path analysis using the structural equation modeling (SEM) method. The resulting model will contribute to the development of a comprehensive, more realistic, and more effective preventive and therapeutic strategy for mental health problems in adolescence, encompassing all factors shown to be directly and indirectly affecting mental health.

Certainly, it is quite unlikely that any single research can address all aspects and all categories of factors influencing mental health, and the authors of the present study do not claim so, either.

MATERIALS AND METHODS

Study design and participants
The study was conducted in two parts: the first part being a comprehensive review which the preliminary proposed conceptual model was derived from and the second part being a cross-sectional study for trying out the proposed model and arriving at the final model.

In the cross-sectional correlational phase of the study, adolescents aged 11–14 years and living in Tehran city were selected by a multistage randomized cluster sampling method from June 2018 to September 2018.

Sampling
To include the various cultural-socio-economic classes living in Tehran, sampling was performed in the north, south, east, and west regions of the city. In this study, only normal adolescents were included and the participants with previously diagnosed psychological disorders were excluded. It was not possible to investigate their previous exposures and possible confounding factors acting in the process of their mental health status. The sample size in each region was determined proportional to the size of the population, resulting in a total of 254 samples. We calculated the sample size considering 95% confidence ($\alpha = 0.05$), a power of 0.8, and an expected root mean square error of approximation (RMSEA) =0.08, utilizing STATISTICA 12 software (StatSoft, Inc., Tulsa, Oklahoma, United States) in power analysis in SEM procedure, which resulted in 206 samples. Considering the fact that we utilized the SEM as the analytical statistical model, our sample size satisfied the minimum required. Hence, we did not take into account the design effect.

In each region, schools, parks, coffee shops, libraries, sports clubs, cinemas, and cultural centers were identified as cluster areas and selected, conveniently. An approximately equal number of girls and boys were selected from each cluster area (5 girls and 5 boys).

The sample represented all various cultural-socio-economic classes living in four different districts of Tehran. It included more girls (57.48%) than boys, and 13-year-olds constituted a larger portion of the sample (29.91%) than other age groups. Further, the highest percentage of mothers' and fathers' education belonged to the high school diploma level and the least percentage of parents were illiterate [Table 1].

Table 1: Demographic characteristics of adolescents participating in the study

Variable	Frequency (%)		
	Girls	**Boys**	**Total**
Age (years)			
11-<12	32 (13.11)	26 (10.65)	58 (23.77)
12-<13	30 (12.29)	26 (10.65)	56 (22.95)
13-<14	40 (16.39)	33 (13.52)	73 (29.91)
14-15	38 (15.57)	19 (7.78)	57 (23.36)
Total	140 (57.37)	104 (42.62)	244 (100)
Mother's education			
Illiterate			7 (2.75)
Elementary			58 (22.83)
High school diploma			120 (47.24)
College			59 (24.18)
Total			244 (100)
Father's education			
Illiterate			4 (1.57)
Elementary			65 (25.59)
High school diploma			103 (40.55)
College			13 (5.32)
Total			244 (100)

Procedure

Deriving a preliminary conceptual model from literature review

Since we needed to propose a conceptual model based on scientific evidence in the first place, a comprehensive literature review was conducted searching databases such as the Health Technology Assessment, the Collaborative Review Groups, Scopus, Google Scholar, PubMed – NCBI, ERIC, and Science Direct Elsevier, with relevant keywords. The aim of the search was to find studies focusing on factors related to or affecting mental health. The selected articles have advantage in terms of full-text availability, relevance to the study objectives, the importance and priority of the factor in question, its measurability with available tools, and its preventability. Thus, eight important factors were identified and integrated to ultimately result in a model that was proposed as the "conceptual model" of the factors affecting adolescent mental health [Figure 1].

Field trial of the preliminary conceptual model

Next, a field trial of the conceptual model had to be carried out. Young adolescents aged 11–14 years living in Tehran were selected by a multistage random cluster sampling method from June to September 2018. First, they were informed about the research, verbally. If they decided to comply, parent/guardian consent form and the questionnaires that required to be completed either by the adolescent or his/her mother were handed out. An appointment was made for collecting the questionnaires a few days later, and the contact information was obtained. The researcher provided her/his contact information as well, in case the adolescent or his/her mother had any questions.
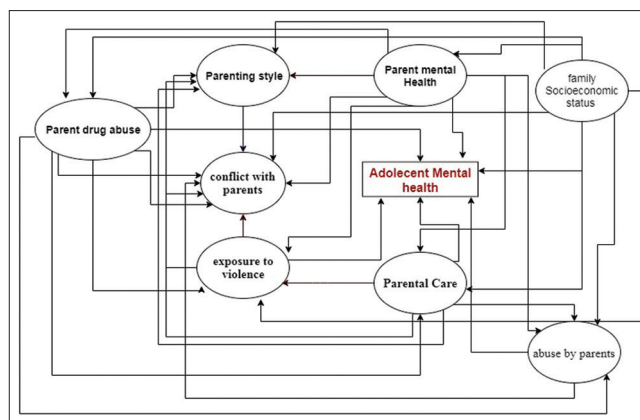

Figure 1: The proposed conceptual model of mental health in Iranian adolescents

Variables

In this study, we had 11 variables, each of which could serve as both independent and dependent variables in the model. These included experience of care from the mother, experience of care from the father, abuse by the mother, abuse by the father, conflict with the mother, conflict with the father, exposure to violence, parents' drug abuse, parenting style, parental mental health, and socioeconomic status of the family. Adolescent mental health was the 12th variable serving as the main dependent variable in the model (final outcome). In addition, sex and age were two demographic variables serving only as independent variables.

Measures

The following questionnaires were used to measure the desired variables: (1) Strengths and Difficulties Questionnaire (SDQ) for assessing adolescents' mental health (Cronbach's α = 0.73). The SDQ has five subscales each of which consists of five items. Four subscales provide a "total difficulties" score ranging from 0 to 40, whereas the prosocial behavior scale independently reflects and scores "strengths;"[24,25] (2) Childhood Experience of Care and Abuse Questionnaire (CECA-Q) for assessing experience of care from mother and father, as well as abuse by mother and father (internal scale consistency [α = 0.80]). The parental care scored on a Likert scale scoring of the parental care is done on a 5-point scale (1 = definitely yes, 3 = unsure, 5 = not at all), as well as physical abuse by parents score ranging from 0 to 4;[26,27] and (3) Child Exposure to Domestic Violence Scale for assessing adolescents' exposure to violence (Cronbach's α = 0.89). This questionnaire consists of 33 questions and 5 subscales, scored on a Likert scale, and scored from 0 to 99. A higher score indicates higher exposure.[28,29] These three questionnaires were answered by the adolescents. In addition, (4) Drug Abuse Screening Test (DAST-10) for assessing parents' drug abuse (Cronbach's α = 0.92). DAST-10 consists of 10 questions. Each question answered "yes" is scored 1 point. The total score ranges from 0 to

10. The higher the score, the higher the risk of severe drug abuse.[30-32] (5) Baumrind Parenting Style Questionnaire for evaluating parenting style (Cronbach's α = 0.84). The questionnaire is scored on a Likert scale and scored from 1 to 5, which is obtained by summing the scores of the questions and dividing it by the number of questions.[33,34] (6) Conflict Behavior Questionnaire (CBQ) for assessing adolescents' conflict with mother and father (Cronbach's α = 0.57). The questionnaire is in two separate forms, one for the mother and one for the father. The higher score on this questionnaire indicates more adolescent conflict with parents.[35] (7) General Health Questionnaire-28 for evaluating parental mental health (Cronbach's α = 0.90). The maximum score is 84 and the minimum score for the 28 version is 0. The higher the overall score, the worse the overall health status of an individual;[36] and (8) Garmaroodi Socioeconomic Status Questionnaire for assessing the socioeconomic status of the family (Cronbach's α = 0.60). This questionnaire consists of 10 questions. The maximum score is 48.[37] The latter five questionnaires were answered by mothers.

Three of the eight mentioned questionnaires (DAST, CECA-Q, and CBQ) required Persian translation, which was performed. The other tools already had a Persian version available. The reliability of these three was determined by Cronbach's alpha coefficient (which were determined to be 0.932, 0.70, and 0.732, respectively for DAST, CECA-Q, and CBQ), as well as the Omega coefficient using the JASP software. Further, the construct validity of all three tools was evaluated by confirmatory factor analysis (CFA).

Ethical issues

This study was approved by the Ethical Committee of the University of Social Welfare and Rehabilitation Sciences (Code: IR.USWR.REC.1398.008).

Data analysis

Data were expressed by frequency (percent) and mean (standard deviation) for categorical and numeric variables, respectively. Using the data collected for the desired variables, the fitness of the proposed conceptual model was tested with path analysis using the SEM method, resulting in the final model.

Favorable "goodness-of-fit" indices were considered to be common factor analysis (CFA) as χ^2/df < 5; RMSEA <0.08; comparative fit index (CFI) >0.9; goodness-of-fit index (GFI) >0.9; and adjusted GFI (AGFI) >0.9.[38]

Statistical analysis was performed using SPSS 15.0 and AMOS 24 (SPSS Inc. IL, Chicago, USA). $P < 0.05$ was considered statistically significant. Missing values were handled using the list-wise procedure.

RESULTS

Participants' characteristics

Over 254 adolescents found at the selected cluster areas (schools, parks, coffee shops, libraries, sports clubs, cinemas, and cultural centers) were assessed for eligibility, of whom 244 were considered eligible. All eligible individuals (aged 11–14 years) and their parents consented to participate and were recruited. However, 244 (114 boys and 130 girls) completed and returned the questionnaires (response rate = 97.2%) and were finally included and analyzed. The only reasons for noninclusion at this stage were noncompleted questionnaires and lack of follow-up access to the participants for completing them [Table 1].

The proposed conceptual model of mental health in Iranian adolescents

The conceptual model that was proposed based on a comprehensive literature review [Figure 1] predicted that the socioeconomic status of the family correlated directly with adolescent mental health, as well as with all other factors included in the model. Consequently, it also affected adolescent mental health indirectly via other factors. All other factors in the model related directly to adolescent mental health. Each factor also had correlations with some other factors in the model. So, each factor affected adolescent mental health directly, as well as indirectly.

Given the values of the indices presented for this model, as shown, the Chi-square index was <5 (value = 107.667), the RMSEA index was <0.08 (value = 0.071), and the RMR index was <0.1 (value = 0.042), which overall confirmed the adequacy of this model. Furthermore, the fitting indices GFI (value = 0.951), AGFI (value = 0.921), NFI (value = 0.918), NNFI (value = 0.968), RFI (value = 0.914), IFI (value = 0.938), and CFI (value = 0.933) were all >0.9, which demonstrated that the final model fitted the data well and the model achieved an optimal level of fitness [Table 2].

Table 3 demonstrates the path coefficient indices, as well as the significance of all correlations (paths) predicted in the proposed conceptual model. The final model can be seen in Figure 2. In Figure 2, all remaining arrows reflect significant relationships between different factors in the model.

Based on the results of Table 2 and Figure 2, the path coefficients were statistically significant ($P < 0.05$) for a number of paths which are demonstrated by an asterisk in the table and by arrows in the model. In other words, for these paths, the relationship between the factors (variables) constituting the proposed path was confirmed. On the other hand, a number of paths (correlations) proposed in the primary conceptual model were not confirmed (insignificant), and

Table 2: Fitness of the proposed conceptual model based on structural equation modeling

Model	χ^2	df	P	χ^2/df	RMR	GFI	AGFI	NFI	RFI	IFI	NNFI	CFI	RMSEA (95% CI)
Measurement	107.667	61	<0.001	1.765	0.042	0951	0.921	0.918	0.914	0.938	0.968	0.933	0.071 (0.050-0.092)

df=Degree of freedom; χ^2/df=Normed Chi-square; RMR=Root mean R; GFI=Goodness-of-fit index; AGFI=Adjusted goodness-of-fit index; RMSEA=Root mean square error of approximation; NFI=Normed fit index; RFI=Relative fit index; IFI=Incremental fit index; NNFI=Nonnormed fit index; CFI=Comparative fit index; CI=Confidence interval

Table 3: Path coefficient indices for the variables in the model

	Path	Estimate	Standardized estimate	SE	CR	P
Parent MH	Adolescent MH	-0.10	-0.111	0.005	-2.32	0.028*
Experience of mother's care	Adolescent MH	0.043	0.061	0.042	1.029	0.304
Experience of father's care	Adolescent MH	-0.73	-1.112	0.423	-1.998	0.042*
Physical abuse by mother	Adolescent MH	-0.036	-0.080	0.030	-1.194	0.233
Physical abuse by father	Adolescent MH	0.007	0.015	0.031	0.241	0.810
Parenting style	Adolescent MH	0.000	0.003	0.001	0.066	0.947
Experience of domestic violence	Adolescent MH	0.007	0.217	0.002	4.087	<0.001*
Family SES	Adolescent MH	0.019	0.034	0.028	0.690	0.490
Parent drug abuse	Adolescent MH	-0.067	-0.028	0.118	-0.570	0.569
Conflict with mother	Adolescent MH	0.018	0.309	0.004	5.084	<0.001*
Conflict with father	Adolescent MH	0.009	0.135	0.004	2.382	0.017*
Gender	Adolescent MH	0.090	0.139	0.030	2.961	0.003*
Age	Adolescent MH	0.014	0.093	0.008	1.991	0.038*
Family SES	Conflict with mother	-0.579	-0.060	0.587	-0.985	0.325
Family SES	Conflict with father	-0.799	-0.093	0.517	-1.544	0.123
Family SES	Parent MH	-0.134	-0.194	0.042	-3.151	0.002*
Family SES	Physical abuse by father	-0.277	-0.097	0.169	-1.639	0.101
Family SES	Physical abuse by mother	-0.277	-0.097	0.169	-1.639	0.101
Family SES	Parent drug abuse	-0.003	0.004	0.004	-0.041	0.967
Parent drug abuse	Conflict with mother	-1.741	-0.042	2.519	-0.691	0.489
Parent drug abuse	Conflict with father	-2.530	-0.069	2.218	-1.140	0.254
Parent drug abuse	Physical abuse by father	0.043	0.061	0.042	1.029	0.304
Parent drug abuse	Physical abuse by mother	2.873	0.235	0.742	3.871	<0.001*
Parent drug abuse	Experience of domestic violence	8.875	0.120	4.214	2.106	0.035*
Physical abuse by mother	Conflict with mother	-1.856	-0.229	0.666	-2.786	0.005*
Physical abuse by father	Conflict with father	-1.482	-0.203	0.585	-2.534	0.011*
Physical abuse by father	Conflict with mother	0.590	0.071	0.664	0.888	0.374
Experience of mother's care	Conflict with mother	1.641	0.137	0.908	1.807	0.071
Experience of mother's care	Conflict with father	1.913	0.180	0.800	2.392	0.017*
Experience of father's care	Conflict with mother	-0.111	-0.010	0.800	-0.138	0.890
Experience of father's care	Conflict with father	-0.737	-0.075	0.704	-1.047	0.295
Parenting style	Conflict with mother	0.042	0.121	0.021	1.991	0.046*
Parent MH	Experience of domestic violence	-1.006	-0.040	1.394	-0.721	0.471
Parent MH	Parenting style	0.047	0.057	0.040	1.190	0.234
Conflict with mother	Experience of domestic violence	0.485	0.273	0.122	3.987	<0.001*
Conflict with father	Experience of domestic violence	0.436	0.217	0.127	3.420	<0.001*

*Significance (*P*<0.05). SE=Standard error; MH=Mental health; CR=Critical ratio; SES=Socioeconomic status; MH= Mental Health

thus, relevant arrows in the conceptual model had to be eliminated to arrive at the "final model."

As can be seen in Table 3 and Figure 2, parent mental health (*P* < 0.028), experience of father's care (*P* < 0.042), conflict with mother (*P* < 0.001), conflict with father (*P* < 0.017), exposure to domestic violence (*P* < 0.001), as well as age (*P* < 0.038) and gender (*P* < 0.003), had direct effect on adolescent mental health, and thus, variations in these variables directly lead to variations in adolescents' mental health. Mental health problems were more common with older age and in boys.

The results also showed that conflict with mother (*P* < 0.001) and exposure to domestic violence (*P* < 0.001) had the greatest direct impact on adolescent mental health, followed by gender (*P* < 0.003), conflict with father (*P* < 0.017), and parent mental health (*P* < 0.028). In fact, adolescent mental health was reduced by approximately 5 units, per unit increase in conflict with mother, and by about 4 units, per unit increase in exposure to domestic violence.

Conflict with mother (*P* < 0.001) and conflict with father (*P* < 0.001) also directly affected exposure to domestic
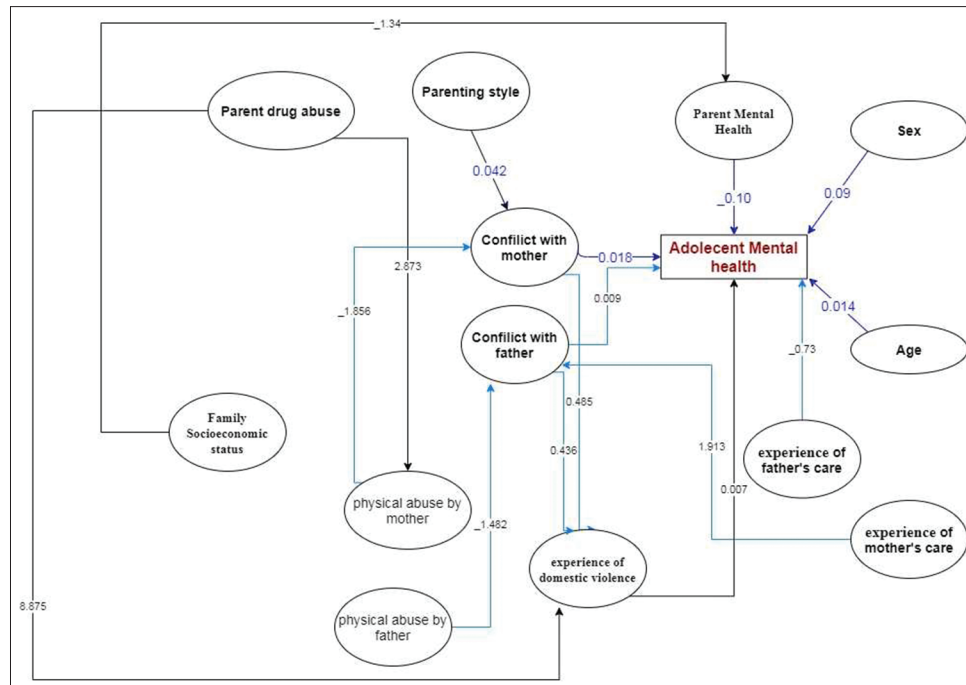
Figure 2: Path diagram of factors affecting adolescent mental health with their relevant coefficient

violence, which in turn directly affected adolescent mental health ($P < 0.001$). Hence, in addition to the direct impact of conflict with mother and conflict with father on adolescent mental health, these two also indirectly affected adolescent mental health through exposure to domestic violence.

Parenting style that did not have any direct impact on adolescent mental health significantly affected conflict with mother ($P < 0.046$), which itself significantly affected experience of domestic violence ($P < 0.001$), as well as directly affecting adolescent mental health ($P < 0.001$). Through these two paths, parenting style indirectly affected adolescent mental health.

Abuse by mother or father only affected adolescent mental health indirectly via their effect on conflict with mother ($P < 0.00$) and father ($P < 0.011$), respectively.

Family socioeconomic status that did not appear to affect adolescent mental health directly affected it indirectly through parent mental health ($P < 0.002$).

Similarly, parent drug abuse acted only indirectly through exposure to domestic violence to influence adolescent mental health ($P < 0.035$).

The direct effects of gender ($P < 0.003$) and age ($P < 0.038$) on adolescent mental health were also notable. Mental health problems were more common with older age and in boys.

The results of decomposing the total effect of the exogenous variables on the final endogenous variable of the conceptual model are presented in Table 4. Considering adolescent mental health as the final endogenous variable, parenting style, abuse by father, abuse by mother, experience of father's care, experience of mother's care, parent drug abuse, conflict with father, and conflict with mother all had an indirect effect on mental health which, along with the direct effects that can be seen in Figure 2, constitute the total effect of the mentioned variables on adolescent mental health [Table 4].

It is noteworthy that the coefficient of determination for the model's output, that is adolescent mental health, was 0.88. In other words, the variables remaining in the final model and the relationships existing between them can predict 88% of the variations in Iranian young adolescents' mental health.

DISCUSSION

Not much research has been devoted to path analysis of factors affecting adolescent mental health in different communities, thus limiting the possibility of comparison in terms of the resulting model.

Peter Kinderman is among the few researchers who has provided a field-tested model of mental health. However, his first attempt in 2005 which was an oversimplified model lacked statistical analysis because it was not backed up by field data.[39] Later, Kinderman (2013) presented his revised

model [Figure 3], modifying and expanding the previous one and providing data for proving it.

Our results resemble Kinderman's revised model in a few ways. We showed that parent mental health directly affected adolescent mental health but no indirect path connected the two. Kinderman likewise demonstrated direct effects but contrastingly suggested indirect effects too , Through the mediating effects of psychological processes.

Another comparable feature in both models is the acknowledgment of the effects of socioeconomic status on mental health. In our model, family socioeconomic status only indirectly affected adolescent mental health via affecting parent mental health, whereas in Kinderman's model, the factor termed "income and education," which is very much analogous to the concept of socioeconomic status, affected mental status (problems and well-being) directly, as well as indirectly, via psychological processes. It is noteworthy that unlike the present study, Kinderman's target population was the adult population. Hence, it seems logical that unlike adolescents, their mental status is directly affected by their socioeconomic status.

Furthermore, the factor termed "relationship status" in Kinderman's model, which exerts direct and indirect effects on mental status, seems analogous to a number of factors in our model, namely experience of mother's care, experience of father's care, conflict with mother, and conflict with father. Even other factors such as parenting style, exposure to domestic violence, and abuse by mother or father can represent latent factors in the concept of "relationships." Reminding our finding that conflict with mother had the greatest direct impact on adolescent mental health, only after exposure to domestic violence, and considering the mediating effects of conflict with mother and conflict with father for other factors in the model, as well as their indirect effect on adolescent mental health through experience of domestic violence, we can speculate that conflict with parents plays an important role in the pathway leading to unfavorable adolescent mental health status in the Iranian population.

The main limitations of the present study consisted of the considerable number of questionnaires that had to be completed by the adolescent and his/her mother, which may have resulted in lower precision. Further, as it was not possible to investigate the participants' previous exposures and possible confounding factors acting in the process of their mental health status, this may have had unnoticed effect on the outcomes. Moreover, the age range of the sample limits the claim that they represent all Iranian adolescents. Actually, they mainly represent the "young adolescent" population in Iran. Finally, inevitable cultural influences may have influenced the truthfulness of the answers to questionnaires involving culturally unsuitable and unacceptable issues, such as drug abuse, abuse by mother or father, and experience of domestic violence.

We recommend that other researchers conduct similar path analysis studies concerning mental health in adolescents of older age, as well as in adults. Furthermore, considering other direct and indirect potential variables in the path, resulting in mental health in different age groups, will be helpful and contributing to the bulk of knowledge regarding this important issue.

We recommend that clinicians and mental health workers, as well as health policymakers in Iran and other countries
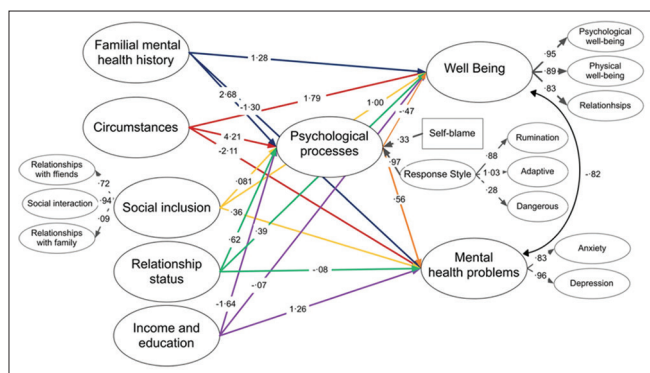

Figure 3: Model presented by Kinderman-2013 (47)

Table 4: Standardized direct, indirect and total effects for exogenous on endogenous variables in the model

	PS	FPA	MPA	FC	MC	DA	CF	CM	PMH	DV
CF	0.02 (0.00)0.02	−0.21 (0.00) −0.21	0.29 (0.00) 0.29	−0.23 (0.00) −0.23	0.15 (0.00) 0.15	−0.06 (0.00) −0.06	NA	NA	NA	NA
CM	0.12 (0.00)0.12	0.05 (0.00) 0.05	−0.06 (0.00) −0.06	−0.10 (0.00) −0.10	0.13 (0.00) 0.13	−0.02 (0.00) −0.02	NA	NA	NA	NA
DV	0.00 (0.04)0.04	0.00 (−0.03) −0.03	0.00 (0.04) 0.04	0.00 (−0.07) −0.07	0.00 (0.06) 0.06	0.13 (−0.02) 0.11	0.21 (0.00) 0.21	0.27 (0.00) 0.27	−0.04 (0.00)−0.04	NA
MH	0.00 (0.05)0.05	0.03 (−0.02) 0.01	0.00 (0.04) 0.04	−0.09 (−0.12) −0.21	0.06 (0.11) 0.17	0.03 (−0.02) 0.01	0.14 (0.05) 0.19	0.31 (0.06) 0.37	0.06 (−0.01)0.05	0.21 (0.00)0.21

The results are adjusted for age, sex and family SES. The numbers indicate the direct (indirect) total effects, respectively. CF=Conflict with father; CM=Conflict with mother; PMH=Parent mental health; DV=Experience of domestic violence; MH=Adolescent mental health; PS=Parenting style; FPA=Physical abuse by father; MPA=Physical abuse by mother; FC=Experience of father's care; MC=Experience of mother's care; DA=Parent drug abuse; NA=Not applicable path based on the conceptual model; SES=Socioeconomic status

with similar cultural and socioeconomic status, especially consider conflict with the mother and exposure to domestic violence, which were shown to have the greatest direct impact on adolescent mental health in the present study, as important factors. These two followed by conflict with the father and parent mental health, have to be dealt with when planning for prevention or treatment of mental health problems in the young adolescent population.

CONCLUSION

The present study demonstrated that parent mental health, experience of father's care, conflict with mother, conflict with father, and exposure to domestic violence, as well as gender and age, had direct effect on adolescent mental health. Conflict with mother and exposure to domestic violence had the greatest direct impact. Conflict with mother and conflict with father also affected adolescent mental health indirectly through experience of domestic violence and had a mediating effect for the influence of several other factors on adolescent mental health, namely parenting style, abuse by mother, and abuse by father, thus seemingly playing an important role in the pathway leading to adolescent mental health status. Family socioeconomic status and parent drug abuse did not affect adolescent mental health directly and acted only indirectly through parent mental health and exposure to domestic violence, respectively.

Overall, the factors constituting the final model were able to predict 88% of the variations in the mental health of young Iranian adolescents. By shedding light on the direct and indirect factors affecting mental health in Iranian adolescents, this model can guide clinical psychologists, psychiatrists, and other mental health workers in a more realistic and effective prevention or treatment planning for their young clients. Moreover, it may help in arriving at a comprehensive preventive policymaking for mental health policymakers in Iran and other socio-culturally similar countries in the region.

Conflicts of interest
There are no conflicts of interest.

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