Original Article

Factors Associated with Depression among School-going Adolescent Girls in a District of Northern India: A Cross-sectional Study

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ABSTRACT

Context: Depression among adolescents, especially among girls, is a rising public health problem worldwide. It has been associated with a profound negative impact on their physical, social, and mental well-being. Aim of the Study: To ascertain the factors associated with depression among school-going adolescent girls in district Barabanki of Uttar Pradesh. Settings and Design: School-based cross-sectional study. Subject and Methods: The study was conducted among 2187 school-going adolescent girls (10–19 years) in Barabanki district from September 2016 to September 2017 using multistage sampling. Sociodemographic characteristics such as age, residence, family background, and socioeconomic status were assessed through direct interview of the adolescent girl, with its reconfirmation from school records. Eleven-item Kutcher Adolescent Depression Scale was used for assessment of depression. Statistical Analysis Used: Probability (P) was calculated to test for statistical significance at 5% level of statistical significance. Association between risk factors and depression was determined using bivariate analysis followed by multivariate logistic regression. Results: The prevalence of depression was found to be 39.7%. Multiple logistic regression revealed that depression was significantly higher among those residing in rural areas [odds ratio (OR) 3.32; P < 0.001], those in early and mid-adolescent age group (OR 2.51; P < 0.001), those studying in private schools (OR 3.22; P < 0.001), and those with Hindi as the medium of instruction (OR12.50; P < 0.001). Depression was also found to be significantly higher among those whose mothers were educated up to primary (OR 3.19; P < 0.01) or up to intercollege (OR 1.59; P < 0.001) when compared with illiterate mothers. Similarly, depression was found to be more common among those girls whose fathers were educated up to intercollege (OR 1.29; P < 0.05) or were graduate and above (OR 1.58; P < 0.001). Conclusion: A significant proportion of school-going adolescent girls were suffering from depression, which reflects the need for reinforcement and strengthening of school-based mental health screening programs. Parents, teachers, and community health workers should work as a team to deal with the problem in a more effective way.

Key words: Adolescent, depression, predictors

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INTRODUCTION

There are about 1.2 billion adolescents worldwide, with one in every five people in the world being adolescent.^[1] In South-East Asia Region (SEAR) itself, there are about 350 million adolescents, comprising about 22% of the population.^[2] India is the second most populous country in the world with a total population of more than 1.21 billion, with an adolescent population of approximately 243 million.^[3]

The period of adolescence represents a transitional stage from childhood to adulthood and represents the critical time frame during which an individual undergoes a variety of developmental changes along with an encounter with a number of emotional and psychosocial issues. Globally, it has been reported that depressive disorders often start at an early age, with prevalence rates of mental illness among children and adolescents ranging between 1% and 51%.[4] More precisely, among adolescents between the age of 14 and 19 years, the prevalence was reported to be from 15% to 20%. [5] Depression is a global concern for children, adolescents, and adults even in developed nations. [6] Major depression was the fourth most frequent human illness in 1990 and is projected to rank second by the year 2020 in the adolescent age group.^[7] In India, the combined prevalence of depression and anxiety among school-going adolescents has been reported as 57.65%, with 3% cases of extremely severe depression.^[4] Depressive disorders are reported to be considerably more common in females, with a lifetime prevalence of 14.1% for females and 8.6% for males.[8,9] This has been attributed to genetics, increased prevalence of anxiety disorders in females, biological changes associated with puberty, cognitive predisposition, and sociocultural factors.[10] From health-seeking and treatment point of view, about half of depressed adolescents are left undiagnosed in primary care settings.[11]

Depression also has a deep effect on adolescents' psychosocial domain and academic performance. More often, they are more preponderate toward probability for hospitalizations, recurrent depressions, substance abuse, and antisocial behaviours, and with time, the most devastating outcome is suicide, which is the third leading cause of death among older adolescents.[12] Studying the level of depression and its association with various biosocial factors among adolescents, especially girls, will help in the development of effective preventive strategies. Based on the findings of a preliminary study done in the settings where this study was conducted,[13] this was conducted as a more extensive study to estimate the prevalence of depression among school-going adolescent girls and various sociodemographic associated with it.

SUBJECT AND METHODS

This was a cross-sectional study among school-going adolescent girls (10–19 years) studying in government, government-aided, and private schools of Barabanki district in Uttar Pradesh from September 2016 to September 2017.

Sample size

Assuming the prevalence of depression to be 18.7% based on the finding of the preliminary study, an absolute precision of 2%, and design effect of 1.5, the total sample size calculated was 2187 (formula used: $n = Dz^2pq/d^2$; where n = sample size, D = design effect, z = value of standard normal deviate = 1.96 at 95% confidence interval (CI), p = prevalence of nonadherence, q = 1 - p, and e = absolute precision.

Sampling technique

Multistage sampling technique was used. In the first stage, Barabanki district was divided into urban Barabanki and blocks of rural Barabanki. From the different blocks of rural Barabanki, two blocks were randomly selected. A detailed list of schools (both government and private) was obtained from officials of District Education Office for both urban and two randomly selected blocks of Barabanki district. In the second stage, a total of eight schools (four from an urban area and two schools each from two selected rural blocks) were selected randomly. Probability proportionate to size strategy was adopted to enrol a certain number of participants from each school. In the third stage, in each of the selected schools, a list of girl students was obtained from the principal. Then, the students were randomly selected from each class.

Data collection

A predesigned and pretested questionnaire was used for baseline data, including questions related to the number of family members and family type, the educational and occupational status of parents, enjoyment modes, and involvement in routine, including indoor and outdoor, activities. Each question was elaborated by one of the investigators, and simultaneously, the students were asked to fill in their answers in the questionnaire. The investigators included one faculty member and one postgraduate resident of the Department of Community Medicine, who together received 2 weeks training in the psychiatry department of the institution before implementation and use of Kutcher Adolescent Depression Scale (KADS) in the school settings.

Assessment of depression

Eleven-item KADS, specifically designed to diagnose and assess the severity of adolescent depression, was used. Items are scored from 0 to 3, with 0 denoting

"hardly ever" and 3 "all of the time." The scores range from 0 to 33. Higher scores indicate a greater number of depressive symptoms. [15] For the purpose of analysis, the score was dichotomized, with ≥9 being indicative of depression. Used with a cut-off score of 9, the 11-item KADS has sensitivity and specificity of 89% and 90%, respectively. [16]

Statistical analysis

Data collected were directly entered, after data cleaning and rechecking, to Epi Info software. Independent variables that were found to be statistically significant in univariate analysis were considered for logistic regression model to determine the important correlates, with depression as the dependent variable. A P value of ≤ 0.05 was considered statistically significant.

Ethical clearance

Prior permission was obtained from the District Education Officer (DEO), Barabanki, and principals of the selected schools before conducting the study, and parents were informed too through school channels. Assent was also obtained from the students after explaining to them about the objectives of the study and assuring them that their responses would be kept confidential. Permission to carry out the study was obtained from the Institutional Ethics Committee. In addition, owing to ethical responsibility, parents of those adolescents who screened positive for depression were informed with the help of school authorities and assisted for proper health seeking to a nearby health facility for further evaluation. But no data were thereafter gathered during follow-up due to feasibility and attrition issues.

RESULTS

Biosocial characteristics

Of the total 2187 school-going adolescent girls enrolled in the study, almost half (47.1%) were in the age group of 14–16 years (mid-adolescents), followed by 31% late adolescents and 21.9% early adolescents. About 45% of the girls were studying in 11th or 12th standard (class). A majority (76.2%) belonged to Hindu religion. Around 45.6% belonged to Other Backward Castes (OBC), followed by general category and Scheduled Caste/Tribes (64.9% and 65.5%, respectively). Almost two-thirds belonged to a rural background and joint family (35.9% and 18.5%, respectively). About half (52.9%) were studying in a government school, and a majority (76.0%) had Hindi as the primary medium of instruction. Almost half (51.5%) of the fathers of these girls were educated up to intercollege (12th standard), with farming/agriculture work as their main occupation. Almost half (50.4%) of the mothers were illiterate, and a majority of them were housewives (83.0%). About two-thirds (66.2%) of the girls belonged to lower socioeconomic status [Table 1].

Symptoms of depression during past 1 week

About 68.4% of the girls hardly ever reported low mood, sadness, or down feeling during the past 1 week. Around 66.9% mentioned that they hardly ever got irritable or lost temper easily or got pissed off during the past week. About 17.1% perceived that much of the time during the past 1 week, life was not very much fun and that they are not getting as much as pleasure from things as usual. About one-fifth (19.4%) felt decreased interest in hanging out with friends, lack of interest in outings, and doing school work and recreational activities much of the time. Half (50.5%) hardly ever suffered from a feeling of worthlessness or hopelessness or not being a good person during the last week. A major proportion (75.3%) hardly ever felt tired, fatigued, unmotivated, and so on during the past 1 week, and 61.8% hardly ever had any trouble to concentrate. However, 10.1% felt worried, nervous, panic, tensed, and anxious much of the time. About one-fourth (25.2%) reported physical symptoms such as headache, nausea, and restlessness much of the time over the last week. The majority (72.9%) hardly ever reported of having any thoughts/plans/actions about suicide or self-harm over the last 1 week. However, seven girls (0.3%) had the thought of suicide/self-harm almost all the time during the last 1 week [Table 2].

Factors associated with depression

The prevalence of depression was found to be 39.7%. Univariate analysis revealed that depression was significantly higher (P < 0.05) among girls in the early and mid-adolescent age group, those who belonged to general or OBC categories, those who reside in rural area, those who belonged to lower middle and upper socioeconomic status, those who study in private schools, and those who study in schools with Hindi as medium of instruction. Also, the higher literate status of parents (as compared to illiterate) and unemployed or in service occupational status of mother (when compared with labor/agricultural workers) were found to be associated more with chances of depression among the girls.

Multiple logistic regression revealed that depression was significantly higher among those residing in rural areas (odds ratio [OR] 3.32; 95% CI 2.60–4.25; P < 0.001), those in early and mid-adolescent age group (OR 2.51; 95% CI 1.85–3.33; P < 0.001), those studying in private schools (OR 3.22; 95% CI 2.32–4.54; P < 0.001), and those with Hindi as the medium of instruction (OR 12.50; 95% CI 8.33–20.0; P < 0.001)

Table 1: Distribution of school-going adolescent girls on the basis of background characteristics (n=2187)

Biosocial characteristics	Number	Percentage (%
Age group (years)		
Early adolescents (10-13)	479	21.9
Mid-adolescents (14-16)	1030	47.1
Late adolescents (17-19)	678	31.0
Class		
6^{th} - 8^{th}	657	30.0
9th-10th	547	25.0
11th-12th	983	44.9
Religion		
Hindu	1666	76.2
Non-Hindu	521	23.8
Category		
General	786	35.9
Other Backward Caste	998	45.6
Scheduled Caste/Scheduled Tribe	403	18.5
Residence		
Rural	1420	64.9
Urban	767	35.1
Type of family		
Nuclear	975	44.6
Joint	1212	65.5
Type of school		
Government	1156	52.9
Government-aided	258	11.8
Private	773	35.3
Medium of instruction		
English	524	24.0
Hindi	1663	76.0
Father education		
Illiterate	583	26.7
Up to primary	418	19.1
Up to intercollege	1126	51.5
Graduate and above	60	2.7
Mother education		
Illiterate	1103	50.4
Up to primary	472	21.6
Up to intermediate	570	26.1
Graduate and above	42	1.9
Father occupation		
Unemployed	111	5.1
Farmer/agricultural worker	1442	65.9
Service/business/professional	634	29.0
Mother occupation		
Housewife/unemployed	1815	83.0
Labor/agricultural worker	279	12.8
Service/business/professional	93	4.3
Socioeconomic status*		
Upper	29	1.3
Upper middle	48	2.2
Middle	161	7.4
Lower middle	501	22.9
Lower	1448	66.2

^{*}Modified BG Prasad Socioeconomic scale 2017

Depression was also found to be significantly higher among school-going adolescents whose mothers were educated up to primary (OR 3.19; 95% CI 1.44–6.76;

P < 0.01) or up to intercollege (OR 1.59; 95% CI 1.23–2.06; P < 0.001) when compared to illiterate mothers. Similarly, depression was found to be more among those adolescent girls whose fathers were educated up to intercollege (OR 1.29; 95% CI 1.01–1.66; P < 0.05) or were graduate and above (OR 1.58; 95% CI 1.17–2.12; P < 0.001), when compared with those whose fathers were illiterate [Table 3].

DISCUSSION

About one-third of school-going adolescent girls were having depressive symptoms. The prevalence of depression was found to be 39.7%. This is much higher compared with the findings of a preliminary study conducted in the same settings, in which the prevalence was found to be 18.7%.[13] The prevalence of depression we detected is also much higher when compared with other previous Indian studies.[17-19] However, the prevalence is quite low when compared with the findings of Jha et al., Nagendra et al., Mohanraj et al., and Malik et al., where the prevalence of depression was reported between 50% and 60% among school-going adolescents.[20-23] Also, a study conducted by Sandal et al. had found the combined prevalence of anxiety and depression to be about 57.65% among school-going adolescents.[4] Ganesh et al. had reported a much higher prevalence of 71.5%.[24] This disparity could be possibly due to the different methods used for the assessment of depression in these studies and the difference in the baseline variables of the study populations.

In this study, prevalence of depression was found to be two and a half times higher among early and mid-adolescent age group. However, it was just opposite to the findings of a preliminary study conducted in the same settings as well as other previous studies where the proportion of adolescents in older age group were having comparatively more probability of depression. [13,22,25,26] Adolescence is a transition phase from childhood to adulthood. During initial stages of adolescence, especially among females, a number of physiological developmental changes take place. This high prevalence of depression indirectly reflects toward the neurobiological vulnerability among the adolescent girls and difficulties faced by them in coping with these changes during their period of transition from childhood to adulthood.

Prevalence of depression was also found to be about three times higher among adolescents belonging to rural areas. The finding was similar to that of a previous study conducted at Chandigarh by Singh *et al.* [27] Meng *et al.* opine that adolescents from a rural background are more likely to have a poor family environment. This might

Table 2: Distribution of symptoms of depression among school-going adolescent girls during last week (n=2187)

Symptoms of depression over past 1 week*	Hardly ever	Much of the time	Most of the time	All the time
Low mood, sadness, feeling blah or down, depressed, just cannot be bothered	1495 (68.4)	335 (15.3)	311 (14.2)	46 (2.1)
Irritable, losing your temper easily, feeling pissed off, losing it	1464 (66.9)	368 (16.8)	295 (13.5)	60 (2.7)
Sleep difficulties - different from your usual (over the years before you got sick): trouble falling asleep, lying awake in bed	1349 (61.7)	635 (29.0)	188 (8.6)	15 (0.7)
Feeling decreased interest in hanging out with friends; being with your best friend; being with your boyfriend/girlfriend; going out of the house; doing school work or work; doing hobbies or sports or recreation	1549 (70.8)	425 (19.4)	191 (8.7)	22 (1.0)
Feelings of worthlessness, hopelessness, letting people down, not being a good person	1105 (50.5)	889 (40.6)	164 (7.5)	29 (1.3)
Feeling tired, feeling fatigued, low in energy, hard to get motivated, have to push to get things done, want to rest or lie down a lot	1647 (75.3)	389 (17.8)	142 (6.5)	9 (0.4)
Trouble concentrating, cannot keep your mind on schoolwork or work, daydreaming when you should be working, hard to focus when reading, getting "bored" with work or school	1352 (61.8)	658 (30.1)	161 (7.4)	16 (0.7)
Feeling that life is not very much fun, not feeling good when usually (before getting sick) would feel good, not getting as much pleasure from fun things as usual (before getting sick)	1601 (73.2)	373 (17.1)	187 (8.6)	26 (1.2)
Feeling worried, nervous, panicky, tense, keyed up, anxious	1581 (72.3)	221 (10.1)	324 (14.8)	61 (2.8)
Physical feelings of worry like headaches, butterflies, nausea, tingling, restlessness, diarrhea, shakes or tremors	1400 (64.0)	552 (25.2)	205 (9.4)	30 (1.4)
Thoughts, plans, or actions about suicide or self-harm	1594 (72.9)	507 (23.2)	79 (3.6)	7 (0.3)

 $Values \ in \ the \ parentheses \ () \ are \ row \ percentages. \ *Based \ on \ the \ items \ of \ Kutcher \ Depression \ Scale$

Table 3: Univariate and multivariate analyses of the factors associated with depression among school-going adolescent girls

Variables		Depression			Adjusted OR
	Absent (n=1317)	Present (<i>n</i> =870)	Total (n=2187)	OR (95% CI)	(95%CI)
Age category (years)					
Early and mid-adolescents	883 (67.0)	626 (72.0)	1509 (69.0)	1.26 (1.04-1.52)	2.5 (1.85-3.33)###
Late adolescents	434 (33.0)	244 (28.0)	678 (31.0)	Ref	erence
Religion					
Non-Hindu	299 (22.7)	222 (25.5)	521 (23.8)	1.16 (0.95-1.42)	NA
Hindu	1018 (77.3)	648 (74.5)	1666 (76.2)	Ref	erence
Category					
General	473 (35.9)	313 (36.0)	786 (35.9)	1.32 (1.03-1.70)	1.13 (0.84-1.50)
Other Backward Class	575 (43.7)	423 (48.6)	998 (45.6)	1.47 (1.15-1.88)	1.05 (0.79-1.38)
Scheduled Caste/Scheduled Tribe	269 (20.4)	134 (15.4)	403 (18.4)	Reference	
Type of family					
Joint	710 (53.9)	502 (57.7)	1212 (55.4)	1.16 (0.84-1.35)	NA
Nuclear	607 (46.1)	368 (42.3)	975 (44.6)	Reference	
Socioeconomic class*					
Lower middle and above	377 (28.6)	362 (41.6)	739 (33.8)	1.77 (1.48-2.12)	1.12 (0.90-1.40)
Lower	940 (71.4)	508 (58.4)	1448 (66.2)	Reference	
Residence					
Rural	707 (53.7)	713 (82.0)	1420 (64.9)	3.91 (3.19-4.80)	3.32 (2.60-4.25)###
Urban	610 (46.3)	157 (18.0)	767 (35.1)	Ref	erence
Class					
6^{th} – 8^{th}	373 (29.8)	264 (30.3)	657 (30.0)	1.29 (1.05-1.58)	5.17 (3.65-7.30)###
9th-10th	277 (21.0)	270 (31.0)	547 (25.0)	1.18 (1.51-2.32)	3.10 (2.31-4.17)###
11 th -12 th	647 (49.1)	336 (38.6)	983 (44.9)	Reference	
Type of school					
Private	378 (28.7)	395 (45.4)	773 (35.3)	2.06 (1.72-2.47)	3.22 (2.32-4.54)###
Government/government-aided	939 (71.3)	475 (54.6)	1414 (64.7)	Reference	
Medium of instruction					
Hindi	843 (64.0)	820 (94.2)	1663 (76.0)	9.22 (6.96-11.48)	12.5 (8.33-20.0)###
English	474 (35.9)	50 (5.7)	524 (24.0)	Ref	erence
Mother education					

Contd...

Table 3: Contd...

Variables	Depression			Unadjusted	Adjusted OR
	Absent (n=1317)	Present (<i>n</i> =870)	Total (n=2187)	OR (95% CI)	(95%CI)
Graduate and above	13 (1.0)	29 (3.3)	42 (1.9)	3.45 (2.00-5.95)	1.06 (0.82-1.36)
Up to intercollege	309 (23.5)	261 (30.0)	570 (26.1)	1.89 (1.53-2.35)	1.59 (1.23-2.06)###
Up to primary	271 (20.6)	201 (23.1)	472 (21.6)	1.83 (1.40-2.38)	3.19 (1.44-6.76)##
Illiterate	724 (55.0)	379 (43.6)	1103 (50.4)	Ref	erence
Father education					
Graduate and above	25 (1.9)	35 (4.0)	60 (2.7)	4.26 (2.19-8.29)	1.58 (1.17-2.12)###
Up to intercollege	637 (48.4)	489 (56.2)	1126 (51.5)	1.61 (1.31-1.76)	1.29 (1.01-1.66)#
Up to primary	240 (18.2)	178 (20.5)	418 (19.1)	1.41 (1.13-1.76)	1.41 (0.75-2.66)
Illiterate	415 (31.5)	168 (19.3)	583 (26.7)	Reference	
Father occupation					
Unemployed	62 (4.7)	49 (5.6)	111 (5.1)	1.07 (0.71-1.62)	NA
Labor/agricultural worker	889 (67.5)	553 (63.6)	1442 (65.9)	0.85 (0.70-1.02)	NA
Service	366 (27.8)	268 (30.8)	634 (29.0)	Reference	
Mother occupation					
Unemployed/housewives	1069 (81.2)	746 (85.7)	1815 (83.0)	1.67 (1.27-2.20)	1.32 (0.96-1.80)
Service	51 (3.9)	42 (4.8)	93 (4.3)	1.97 (1.22-3.20)	1.06 (0.61-1.83)
Labor/agricultural worker	197 (15.0)	82 (9.4)	279 (12.8)	Reference	
Outdoor physical activity					
More than 3 hours a week	655 (49.7)	468 (57.3)	1123 (51.3)	1.19 (0.99-1.40)	NA
Less than 3 hours a week	662 (50.2)	402 (46.2)	1064 (48.6)	Reference	
Watching television and engagement in social media					
More than 2 hours per day	625 (47.4)	446 (51.2)	1071 (48.9)	1.16 (0.98-1.38)	NA
Less than 2 hours per day	692 (52.5)	424 (48.7)	1116 (51.0)	Ref	erence

Values in parentheses () are column percentages, *Modified BG Prasad Socioeconomic scale 2017, ***P<0.001, **P<0.01, *P<0.05. OR: Odds Ratio; CI: Confidence Interval; NA: Not Applicable

be the reason for the higher prevalence of depression among rural adolescent girls. [28]

In line with the findings reported by Shelke *et al.*,^[17] in this study too, adolescents studying in lower classes (6th–10th) were found to be having more depressive symptoms. However, no such association has been observed in other previous studies.^[13,17,27,29] In contradiction to that, some other previous studies had reported more depressive symptoms among students studying in higher standards and had accounted it to academic pressure.^[4,30,31]

In contradiction to the findings reported by Singh *et al.*,^[27] depression was found to be three times higher among adolescents studying in private schools. This might be attributed to the fact that in Indian scenario, the study culture is more competitive and hectic in private schools when compared with government ones, which thereby leads to stress among students, and on a long-term it may indirectly lead to depression.

A major finding of this study was that adolescent girls studying in Hindi medium schools were about 12 times more preponderate for depression. This finding indirectly reflects the intervening thoughts in the mindsets of these individuals studying in Hindi medium toward prospects in a future career where the

English language has a major role in the upcoming competitive environment.

The results also showed that adolescents with more educated parents were at a higher risk of depression. This finding is contradictory to the results of previous studies where no such association has been observed. [13,27] The finding could be attributed to the fact that educated parents have a higher expectation from their children. Apart from that, they often try to indulge their children more toward academic activities, and often, much of their time of enjoyment/recreational activities get reduced. Second, when compared with educated parents who are often continuously involved in some jobs/outdoor activities, the illiterate parents are more available to their children to share their thoughts, feelings, and free talks, thereby reducing the risk of depression.

Almost majority of the studies in Indian and Asian setup had reported a significant association between socioeconomic status and depression. [4,13,17,29,32,33] However, no such association has been found in our study. This could be explained by the fact that although socioeconomic status has a high impending impact on cognitive and behavioral domains of adolescents, the effect of this individual-level factor could be suboptimized or nullified by other

predominant intervening factors such as parental education, occupation, and other basic background characteristics.

The study findings should be interpreted in the light of some limitations. Since the study was conducted in the schools of only one district of Uttar Pradesh and was cross-sectional in nature, the generalizability is limited and temporal associations could not be established. Apart from that, the diagnosis could not be confirmed from psychiatrists due to feasibility issues. But, besides these limitations, the study was the first of its kind in Barabanki district of Uttar Pradesh and provides a gross reflection about the mental health status of girls in adolescent age group. However, an utmost important factor, that is, the psychosocial environment of the homes, such as parental fights and beating of children by parents, was not explored due to lack of permission from a majority of the concerned school authorities.

CONCLUSION

Adolescent girls are quite preponderated toward the risk of depression. Planned interventions directly targeting the significant predictors would help deal with the problem in a more comprehensive way. Strengthening of routine school health check-ups and implementation of school-based mental health screening programs are the needs of the hour. There is also a need to make the parents understand that their role is of utmost importance from a prevention point of view. Apart from that, the school teachers, parents, and community health workers should coordinate as a team so as to identify any sort of depressive symptoms in a timely manner and seek proper health care if required.

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Conflicts of interest

There are no conflicts of interest.

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