Global Journal of Medicine & Public Health

Effect of yoga and counselling on mental health issues among adolescents in an urban slum of Mumbai: An Interventional Study

Kinjal Chauhan[1], Sanjay Panchal[2], Vinay Kumar[3], Vandana Kashyap[4]

ABSTRACT

Mental health problems in young people is associated with suffering, functional impairment, exposure to stigma, discrimination, and enhanced risk of premature death. Thus, mental health problems among youth have obvious public health significance.

METHODS

The objectives of the study are to assess the prevalence of mental health issues among adolescents in an urban slum of Mumbai, implement an intervention (yoga and counselling) targeting key mental health concerns, and evaluate the post-interventional mental health status. A total of 168 adolescents were selected from the urban slum population of Mumbai for this interventional study. The General Health Questionnaire-28 (GHQ-28) was used to screen and assess mental health status, identifying deviations from the individual's typical mental state. The intervention consisted of yoga and counselling sessions conducted over a period of six months. Post-intervention assessment was conducted using the GHQ-28 to evaluate changes in mental health outcomes.

RESULTS

After the intervention, distress as per the GHQ-28 score reduced from 85.1% to 57.7%, Somatic symptoms and social dysfunction showed statistically significant improvement, while anxiety/insomnia symptoms improved partially without statistical significance, and severe depression symptoms slightly decreased, though the change was not statistically significant.

CONCLUSIONS

The intervention involving yoga and counselling led to a meaningful reduction in overall psychological distress among adolescents. However, persistent symptoms in some domains highlight the need for sustained, community-based mental health strategies

Keywords: Adolescent, urban slum, mental health issues, GHQ 28

GJMEDPH 2025; Vol. 14, issue 2 | OPEN ACCESS

1*Corresponding author: Kinjal Chauhan, Assistant Professor, NAMO Medical Education and Research Institute, Silvassa, kinjalchauhan994@gmail.com;2.Sanjay Panchal,Associate Professor, Department of Community Medicine, HBTMC & RNCH; 3.Vinay Kumar,Assistant Professor, Saraswathi Institute of Medical Sciences, Hapur; 4.Vandana Kashyap, Assistant Professor, Saraswathi Institute of Medical Sciences, Hapur

Conflict of Interest—none | Funding—none

INTRODUCTION

Health is defined by the World Health Organization (WHO) as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"[1]. Adolescence is a formative phase characterized by rapid physical, emotional, and cognitive development. Adolescents are considered vital to national development due to their potential to contribute intellectually, economically, and socially. However, this developmental period is often accompanied by stressors such as academic pressure, identity formation, peer relationships, and risk-taking behaviours, all of which can impact mental health[2]. Globally, mental health disorders account for a significant burden among adolescents, with an estimated 10–20% affected[3]. Nearly half of all lifetime mental health conditions begin before the age of 14, and most go undiagnosed or untreated[4]. Common concerns among adolescents include depression, anxiety, somatic complaints, substance abuse, and suicidal ideation[5]. Suicide remains a leading cause of death among individuals aged 10–19 years, particularly in low- and middle-income countries[6]. Adolescents residing in urban slums face compounded risks due to poverty, overcrowding, exposure to violence, lack of education, and limited access to mental health services[7]. In India, rapid urbanization has led to the expansion of urban slums, where adolescents often experience chronic stress and psychosocial deprivation, increasing their vulnerability to mental health disorders[8]. To screen and assess mental distress, the General Health Questionnaire-28 (GHQ-28) has been widely validated and is effective in identifying psychiatric morbidity in community and school settings[9]. Interventions such as yoga and counselling have shown promise in improving adolescent mental health by reducing stress, enhancing emotional regulation, and promoting resilience[10,11]. Given the critical need for accessible and community-based mental health interventions, the objectives of the study are to assess the prevalence of mental health issues among adolescents in an urban slum of Mumbai, implement an intervention (yoga and counselling) targeting key mental health concerns, and evaluate the post-interventional mental health status.

METHODS

Sample size:

The sample size for this study was calculated based on the findings of a previous study by Gawde and Nasirabadi,[12] which reported a prevalence of mental health issues of 12.5% among adolescents residing in urban slums. Using this prevalence estimate, a confidence level of 95%, and a margin of error of 5%, the minimum required sample size was determined to be 168. This calculation accounted for the expected prevalence but did not include adjustments for potential loss to follow-up, which may be considered a limitation of the study. A total of 168 adolescents from the target population were therefore included.

Inclusion and Exclusion Criteria

The study included adolescents of both genders, aged 10 to 19 years, who were residing in an identified urban slum area of Mumbai and who provided assent to participate in the study. The urban slum selected for the study was within the catchment area of a tertiary care hospital in Mumbai, allowing for logistical feasibility and continuity of follow-up. Participants were required to be permanent residents of the slum area to ensure consistency in the intervention and post-intervention follow-up.Adolescents were excluded from the study if they had a known history of significant head trauma—defined as head injuries leading to loss of consciousness, hospitalization, or requiring neurosurgical evaluation—or if they were diagnosed with epilepsy or had any gross neurological deficits that could interfere with assessment of mental health status or participation in intervention activities such as yoga and counselling.

Study procedure

This interventional study was conducted over a period of two years in an urban slum of Mumbai. The study aimed to assess and address mental health issues among adolescents aged 10 to 19 years, through a combination of yoga-based interventions and counselling sessions.A house-to-house community-based survey was conducted using stratified random sampling. From a total of approximately 11,800 households in the field practice area, every fifth household was selected after identifying a random starting point. If a selected household had no eligible adolescent, the next consecutive household was considered. This method ensured representative sampling across the slum area.Initial home visits were used to build rapport with both the adolescents and their families. Written

informed assent was obtained from adolescents, and parental consent was obtained prior to participation. Interviews were conducted in Marathi and Hindi, the local language spoken in the study area, using a pre-validated, structured interview schedule. The General Health Questionnaire-28 (GHQ-28) was used to assess mental health status at baseline and post-intervention. The interviews took place in a private, safe environment—usually a community hall—ensuring confidentiality and minimizing distress. Health coordinators and local community volunteers helped mobilize participants and supported the study activities.The intervention phase included weekly yoga sessions (45 minutes each) over a period of 6 months, conducted by a certified yoga instructor. Each adolescent was encouraged to practice yoga daily at home, and instructional audio-visual materials in Marathi and Hindi were shared to reinforce learning. In addition, one-on-one counselling sessions were held monthly for each adolescent by trained mental health professionals. Parents/guardians also received at least two counselling sessions during the intervention period to raise awareness about adolescent mental health and their role in supporting positive coping mechanisms at home.After six months, all participants were reassessed using the GHQ-28 to evaluate changes in mental health status following the intervention.

Interpretation of GHQ-28 Questionnaire:
The General Health Questionnaire-28 (GHQ-28) is a widely used screening tool designed to detect psychiatric disorders in community settings and non-psychiatric clinical settings. It consists of 28 items that assess whether an individual's current mental state deviates from their usual state of well-being. These 28 items are grouped into four subscales, each comprising seven items: somatic symptoms (items 1–7), anxiety and insomnia (items 8–14), social dysfunction (items 15–21), and severe depression (items 22–28).Each item is rated by the respondent based on how they have been feeling recently, using a four-point scale: "better than usual," "same as usual," "rather more than usual," and "much more than usual." Responses are scored on a scale from 0 to 3, giving a total possible score range of 0 to 84. A total score of 24 or more is considered the threshold indicating psychological distress. Higher scores correspond to greater levels of distress.

Study instrument: pre-tested semi structured questionnaire was used for collecting socio-demographic information from the participants.

Data collection phase and analysis:
The data was collected from the adolescents of urban slums. The data obtained was entered in a Microsoft Excel Spreadsheet and analysed using Statistical Package for the Social Sciences (SPSS).

RESULTS

The majority (61.3%) of participants were from the age group 10 to 14 years, followed by those in the 15 to 19 years age group (38.7%) (Fig. 1). A slightly higher percentage of participants were male (54.2%) compared to female participants (45.8%) (Fig. 2). Regarding educational background, 38.7% of the participants were in the 8th standard, followed by 28.6% in the 9th standard, and 18.5% in the 6th standard (Fig. 3). In terms of religion, 63.1% of participants identified as Hindu, while 36.9% were Muslim (Fig. 4). A key finding was that distress, as measured by the GHQ-28 score, significantly decreased from 85.1% to 57.7% following the intervention, which involved a combination of yoga and counselling (Fig. 5).

Figure 1 Age distribution of study participants

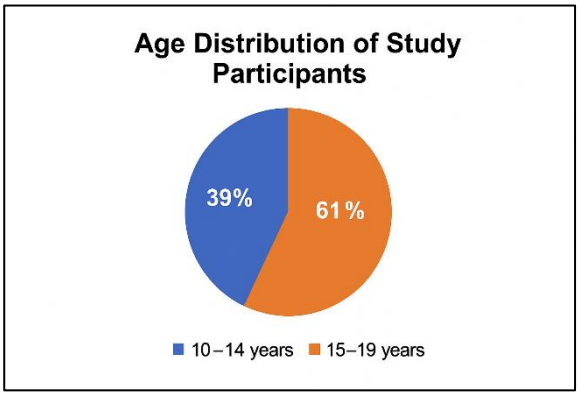
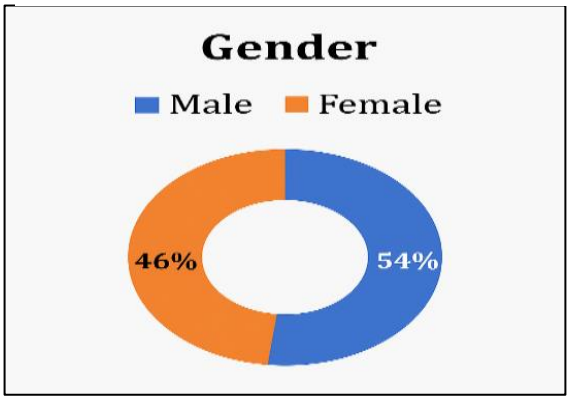


Figure 2 Gender distribution of study participants



ISSN# 2277-9604

Figure 3 Distribution according to Education of the participants.

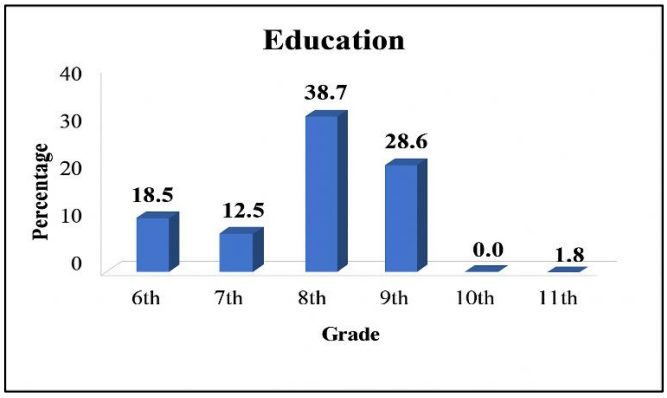
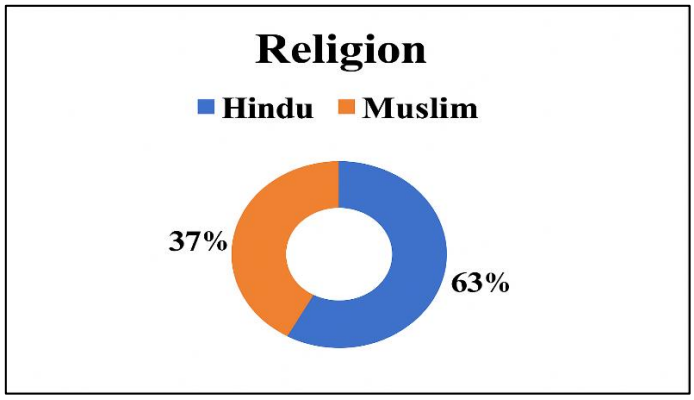


Figure 4 Distribution according to Religion of the participants.



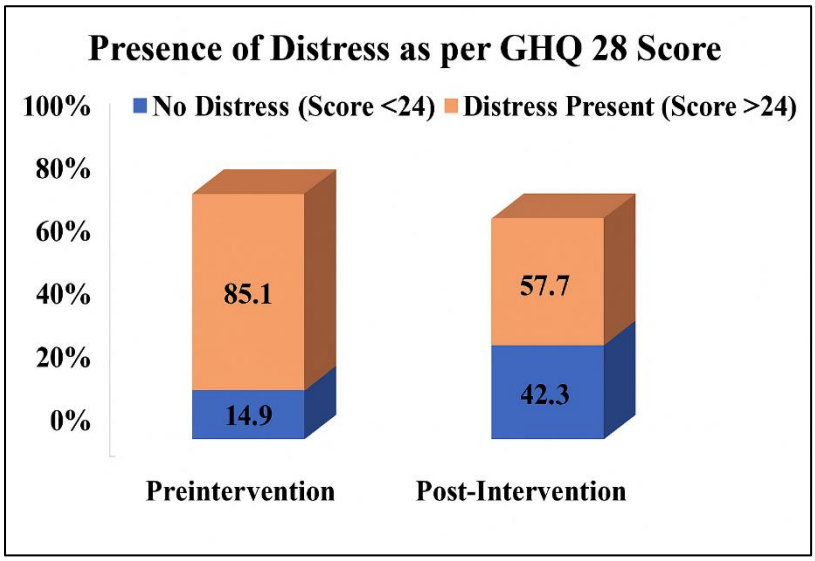


Figure 5 Distribution according to Presence of Distress as per GHQ 28 score Pre intervention and post-intervention.

Table No. 01: Presence of Distress as per Mean GHQ 28 score Pre-intervention and post-intervention

Presence of Distress as per GHQ 28 score	Pre-intervention		Post-Intervention		Paired t test	P Value
	Mean	SD	Mean	SD		
No Distress (Score <24)	14.2	5.3	13.8	4.6	0.738774	0.4606
Distress Present (Score >24)	29.7	5.2	29.3	5.3	0.698266	0.4855

Table 1 presents the changes in GHQ-28 scores before and after the intervention, which included yoga and counselling sessions. Among participants with no distress (GHQ-28 score <24), the mean score slightly decreased from 14.2 ± 5.3 to 13.8 ± 4.6 post-intervention; however, this change was not statistically significant ($p = 0.4606$).Similarly, for those with distress (score >24), the mean score declined marginally from 29.7 ± 5.2 to 29.3 ± 5.3, which was also not statistically significant ($p = 0.4855$). These findings suggest that while there was a minor improvement in GHQ-28 scores following the combined yoga and counselling intervention, the overall reduction in distress was not statistically significant, possibly due to the modest magnitude of change or variability among participants

Table No.: 02- Presence of type of Distress as per Mean GHQ 28 score Pre intervention and post-intervention.

Presence of Distress as per GHQ 28 score	Pre-intervention		Post Intervention		Paired t test	P Value
	Mean	SD	Mean	SD		
Somatic Symptoms (1-7)	8.1	4.1	6.6	4.1	3.3531	0.0008908
Anxiety /Insomnia (8-14)	6.9	4.1	6.1	4.2	1.76665	0.0782
Social Dysfunction (15- 21)	9.1	3.3	7.5	3.5	4.31115	0.0000214
Severe Depression (22- 28)	2.7	3.7	2.4	3.4	0.773829	0.4396

Table 2 Statistically significant improvements were observed in somatic symptoms (mean score reduction from 8.1 to 6.6; $p < 0.001$) and social dysfunction (from 9.1 to 7.5; $p < 0.001$), indicating the combined effect of yoga and counselling was effective in reducing physical complaints and improving social functioning. Yoga's focus on physical awareness and relaxation likely eased somatic distress, while counselling helped participants develop better coping strategies for social challenges. Partial improvements in anxiety/insomnia were noted (mean score reduction from 6.9 to 6.1), though not statistically significant ($p = 0.078$), suggesting the intervention had a limited impact on these more persistent symptoms. Severe depression scores also decreased slightly (from 2.7 to

2.4), but the change was not significant (p = 0.44), indicating that while the intervention had some effect, more intensive or specialized psychological support may be necessary to address deeper emotional distress.

Table No.: 03- Presence of Distress as per GHQ 28 score according to gender.

Presence of Distress as per GHQ 28 score	Male		Female		P Value
	Mean	SD	Mean	SD	
Somatic Symptoms (1-7)	8.0	3.9	8.2	4.3	0.6555
Anxiety /Insomnia (8-14)	7.0	4.3	6.9	3.8	0.8214
Social Dysfunction (15-21)	8.7	3.4	9.5	3.3	0.0293
Severe Depression (22-28)	2.2	3.3	3.4	4.1	0.0034

Table 3 illustrates gender-wise differences in distress domains prior to the intervention. It was observed that male participants exhibited higher levels of social dysfunction and anxiety/insomnia, whereas female participants experienced greater somatic symptoms and severe depression. This pattern is consistent with established gender differences in mental health presentations, where males often exhibit more externalized symptoms and females more internalized distress. These insights underscore the importance of gender-sensitive approaches in designing mental health interventions for adolescents.

Table No.: 04- Effect of intervention to reduce distress according to age group.

Presence of Distress Vs Age		Pre-intervention		Post-Intervention		Paired t test	P Value
		Mean	SD	Mean	SD		
10 -14 Years	No Distress (Score <24)	14.88	7.7	13.22	9.2	1.79344	0.07383
	Distress Present (Score >24)	29.1	7.4	26.1	9	3.33726	0.0009451
15-19 Years	No Distress (Score <24)	13	7.6	14.5	8.9	1.66124	0.09763
	Distress Present (Score >24)	29.1	7.2	29.7	8.6	0.6933	0.4886

Table 4 explores the effectiveness of the intervention across age groups and reveals that it was statistically more effective among participants aged 10–14 years compared to older adolescents. This suggests that younger adolescents may be more receptive to interventions like yoga and counselling, possibly due to greater adaptability and lower baseline distress levels. These findings support the early introduction of structured mental health interventions in school settings.

Table No.: 05- Effect of intervention to reduce distress according to study class.

Presence of Distress Vs Study Class		Pre-intervention Mean	SD	Post-Intervention Mean	SD	Paired t test	P Value
6th	No Distress (Score <24)	17.3	2.9	12.1	4.5	12.5898	0.0000001
	Distress Present (Score >24)	29.4	5.3	29.4	4.3	0.189913	0.8495
7th	No Distress (Score <24)	14.6	4.9	13.9	4.1	1.42009	0.1565
	Distress Present (Score >24)	29.2	5.6	31.6	7.7	3.26725	0.001199
8th	No Distress (Score <24)	14.2	4.8	13.2	4.4	1.99054	0.04735
	Distress Present (Score >24)	29.2	4.7	29.3	4.5	0.1991	0.8422
9th	No Distress (Score <24)	13.3	6.5	16.3	3.4	5.30084	0.00000021
	Distress Present (Score >24)	28.5	5.5	28.7	5.8	0.32431	0.7459
11th	No Distress (Score <24)	5	0	14.6	6.9	18.0334	0.0000001
	Distress Present (Score >24)	30.5	2.1	0	0	188.25	0.0000001

Table 5 analyses the intervention's impact across different academic classes and shows a statistically significant reduction in distress scores both before and after the intervention, irrespective of class level. This indicates that the combined yoga and counselling approach was effective across educational grades, reinforcing its utility as a universal intervention strategy for school-based mental health programs.

DISCUSSION

This study assessed the effectiveness of a combined yoga and counselling intervention in improving mental health outcomes among adolescents residing in an urban slum of Mumbai. The findings reveal a noteworthy reduction in psychological distress post-intervention, particularly in the domains of somatic symptoms and social dysfunction. The proportion of adolescents experiencing psychological distress, as indicated by GHQ-28 scores, decreased from 85.1% pre-intervention to 57.7% post-intervention. Although changes in total mean GHQ-28 scores were not

ISSN# 2277-9604

statistically significant overall, subscale analysis provided clearer insight into the intervention's differential impact. Statistically significant improvements were observed in somatic symptoms (mean score reduction from 8.1 to 6.6; $p < 0.001$) and social dysfunction (from 9.1 to 7.5; $p < 0.001$), aligning with existing evidence that yoga can reduce physical manifestations of stress and improve social functioning by fostering emotional regulation and self-awareness [13,14].Partial improvements in anxiety/insomnia were noted (mean score reduction from 6.9 to 6.1), though not statistically significant ($p = 0.078$). These findings are consistent with earlier studies indicating that while yoga may reduce anxiety, it may require longer duration or adjunctive modalities for significant changes in more persistent symptoms such as insomnia[15]. Severe depression scores also decreased slightly (from 2.7 to 2.4), but the change was not significant ($p = 0.44$), suggesting that additional or more intensive mental health interventions—such as structured psychotherapy or pharmacologic support—might be necessary for addressing deeper affective symptoms[16].Gender-wise analysis revealed statistically significant differences in social dysfunction (higher in females; $p = 0.0293$) and severe depression (higher in females; $p = 0.0034$), consistent with global trends showing that adolescent girls are more prone to internalizing disorders such as depression and social withdrawal[17]. These findings support the need for gender-sensitive mental health programs. Age-stratified analysis revealed that the intervention was particularly effective among younger adolescents (10–14 years), where distress scores showed a significant reduction (mean score dropped from 29.1 to 26.1; $p < 0.001$). This may be attributed to greater neuroplasticity, openness to behavioural change, and adaptability to structured activities among younger participants[18]. In contrast, older adolescents (15–19 years) showed minimal changes, highlighting the need for age-appropriate, tailored interventions. Academic class-wise analysis (Table 5) showed that the intervention was broadly effective across different grades, with particularly significant improvement in distress scores among students in 6th, 8th, and 11th standards. This suggests that mental health interventions, when integrated into school settings, can be beneficial across educational levels. The success of this study highlights the value of combining low-cost, community-based strategies—such as yoga and individual counselling—in urban slum settings where access to formal mental health services is limited. Yoga, with its emphasis on breath control, mindfulness, and posture, has been widely validated as a non-pharmacologic intervention for reducing stress and improving well-being among adolescents[13,14]. Meanwhile, counselling provided a critical opportunity for adolescents to articulate their struggles and receive tailored psychosocial support. The present study has a few limitations. The absence of a control group and the dependence on self-reported data may have introduced some bias. Additionally, the relatively small sample size and short duration of the intervention might have influenced the overall outcomes. A larger sample and longer duration could possibly result in more significant effects. Moreover, the intensity of the intervention may not have been sufficient to address more severe mental health issues. Future studies could consider increasing the frequency of sessions, including peer or group counselling approaches, and evaluating the long-term effectiveness of such interventions.

CONCLUSION

This study suggests that yoga and counselling are promising interventions for improving somatic symptoms and social dysfunction in adolescents, with some effect on anxiety, insomnia, and depression. While the intervention showed positive results in some areas, more intensive or specialized treatments may be required to address persistent symptoms of anxiety, insomnia, and severe depression. The findings emphasize the importance of integrating both physical and psychological strategies in mental health interventions for adolescents and highlight the potential for early intervention programs to support adolescent well-being. Further research is needed to refine these interventions and explore their long-term impact.

REFERENCES

1. Constitution of the World Health Organization. Vol. 61, Public health reports. 1946. p. 1268–79.
2. Patton GC et al. Our future: a Lancet commission on adolescent health and wellbeing. *Lancet*. 2016;387(10036):2423-78.
3. Kieling C et al. Child and adolescent mental health worldwide: evidence for action. *Lancet*. 2011;378(9801):1515-25.
4. Kessler RC et al. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders. *Arch Gen Psychiatry*. 2005;62(6):593–602.
5. Thapar A et al. Depression in adolescence. *Lancet*. 2012;379(9820):1056-67.
6. UNICEF. *Adolescent mental health matters*. 2021.
7. Mathur S et al. Urban adolescents and mental health: The burden and response in India. *Int J Adolescent Med Health*. 2015;27(4):385-92.
8. Agarwal S, Taneja S. All slums are not equal: child health conditions among the urban poor. *Indian Paediatrics*. 2005;42:233-44.
9. Goldberg D, Williams P. *A User's Guide to the General Health Questionnaire (GHQ)*. NFER-Nelson; 1988.
10. Tolahunase M, Sagar R, Dada R. Impact of yoga and meditation on cellular aging in apparently healthy individuals: a prospective, open-label single-arm exploratory study. *Oxid Med Cell Longev*. 2017;2017:7928981.
11. Sharma M. Yoga as an alternative and complementary approach for stress management: a systematic review. *J Evid Based Complementary Altern Med*. 2014;19(1):59–67.
12. Gawde N, Nasirabadi M, Shah N, Nagaonkar S. Psychiatric morbidity in an urban slum of Mumbai: Cross sectional study. Vol. 6, Asian Journal of Psychiatry. 2013. p. 478–82.
13. Telles S, Singh N, Bhardwaj AK, Kumar A, Balkrishna A. Effect of yoga or physical exercise on physical, cognitive, and emotional measures in children: a randomized controlled trial. Child Adolescent Psychiatry Ment Health. 2013;7:37. doi:10.1186/1753-2000-7-37.
14. Khalsa SBS, Hickey-Schultz L, Cohen D, Steiner N, Cope S. Evaluation of the mental health benefits of yoga in a secondary school: a preliminary randomized controlled trial. J Behav Health Serv Res. 2012;39(1):80–90. doi:10.1007/s11414-011-9249-8.
15. Varambally, S., & Gangadhar, B.N. (2019). Yoga and Traditional Healing Methods in Mental Health. In S. Chaturvedi (Ed.), Mental Health and Illness in the Rural World (pp. 1–10). Springer, Singapore.
16. Cramer H, Lauche R, Anheyer D, Pilkington K, de Manincor M, Dobos G, Ward L. Yoga for depression: a systematic review and meta-analysis. Depress Anxiety. 2017;34(11):1025–1032. doi:10.1002/da.22602.
17. Salk RH, Hyde JS, Abramson LY. Gender differences in depression in representative national samples: meta-analyses of diagnoses and symptoms. Psychology Bull. 2017;143(8):783–822. doi:10.1037/bul0000102.
18. Greenberg MT, Domitrovich CE, Weissberg RP, Durlak JA. Social and emotional learning as a public health approach to education. Future Child. 2017;27(1):13–32. doi:10.1353/foc.2017.0001.