

## The Effect of Anxiety Prevention Education on Adolescent Service Recipients in Healthcare Centers: A Review Article

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### Abstract

#### Article history:

Received: 8 Sep 2025  
Accepted: 13 Nov 2025  
Available online: 18 Nov 2025

#### Keywords:

Adolescent anxiety  
Anxiety prevention education  
Cognitive-behavioral therapy (CBT)  
Psychoeducation  
Primary healthcare  
Mental health interventions

**Aim:** This review explores the effectiveness of anxiety prevention education for adolescent service recipients in healthcare centers.

**Methods:** A comprehensive literature review was conducted, synthesizing evidence from systematic reviews, meta-analyses, and randomized controlled trials (RCTs) focusing on anxiety prevention education. Studies were retrieved from databases such as PubMed, PsycINFO, Scopus, and Google Scholar using relevant keywords. Selected studies assessed the effectiveness of psychoeducational interventions, cognitive-behavioral techniques (CBT), and stress management strategies in reducing adolescent anxiety.

**Results:** Evidence indicates that structured anxiety prevention programs, particularly those integrating psychoeducation and CBT, effectively reduce anxiety symptoms and enhance coping skills among adolescents. School-based interventions have shown significant short-term benefits, with some effects persisting for up to a year. However, research on healthcare-based interventions remains limited. Primary healthcare centers, as accessible and community-trusted institutions, have the potential to provide a structured and sustainable approach to anxiety prevention. Challenges such as mental health stigma, resource constraints, and limited training of healthcare professionals must be addressed to optimize program implementation.

**Conclusion:** Integrating anxiety prevention education into healthcare centers in Sari County presents a promising strategy for reducing adolescent anxiety and promoting mental well-being. By leveraging existing healthcare infrastructure and adopting evidence-based interventions, these programs can offer scalable and cost-effective solutions. Policy support, professional training, and community engagement are essential for ensuring the long-term success of such initiatives. Future research should focus on assessing the sustained impact of healthcare-based interventions and developing culturally adapted models tailored to the needs of Iranian adolescents.

**Cite this article as:** Ardehshiri Lajimi M, Rafighi M, Abdollahi A, Frouzian M. The Effect of Anxiety Prevention Education on Adolescent Service Recipients in Healthcare Centers: A Review Article. *Humanist Stud Soc Res.* 2025;1(1):18. <https://doi.org/10.22034/hssr.2025.511598.1008>

### Introduction

Adolescence is a pivotal developmental stage characterized by rapid physical, emotional, cognitive,

and social changes, making young individuals particularly vulnerable to mental health challenges such as anxiety (1). Anxiety is a natural and adaptive

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response to stress, but when excessive or persistent, it can interfere with daily life, academic performance, and social relationships (2). Anxiety disorders are among the most common mental health issues worldwide, affecting approximately 6.5% of children and adolescents, with a lifetime prevalence reaching 28.8% by adulthood (3, 4).

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These disorders encompass generalized anxiety disorder (GAD), social anxiety disorder, panic disorder, separation anxiety, and specific phobias. Left untreated, anxiety disorders can increase the risk of developing depression, substance abuse, and other psychological conditions later in life (5). Adolescents with anxiety often experience excessive worry, restlessness, difficulty concentrating, irritability, sleep disturbances, and physical symptoms such as headaches and stomachaches (6).

In Iran, cultural expectations, intense academic pressure, and limited access to mental health services can exacerbate adolescent anxiety. Studies indicate that 20-30% of Iranian adolescents report experiencing moderate to severe anxiety symptoms, with a higher prevalence among girls due to societal pressures, rigid gender norms, and expectations related to academic performance and future responsibilities (7). Boys, on the other hand, may experience heightened anxiety linked to financial expectations, career uncertainties, and social pressures regarding independence and success (8). Family dynamics also play a crucial role, as parental expectations, authoritarian parenting styles, and economic hardships can contribute to heightened anxiety levels. Furthermore, stigma surrounding mental health issues in Iranian society may prevent adolescents from seeking help, leading to untreated or undiagnosed anxiety disorders (9).

Sari County, the capital of Mazandaran Province, has a population of approximately 500,000, with a significant proportion consisting of adolescents. Several primary healthcare centers serve the region, offering general medical services, vaccinations, and preventive health programs. While these centers have traditionally focused on physical health, they are well-positioned to integrate mental health education into routine adolescent care. Unlike schools, which have been the primary setting for youth mental health interventions worldwide, healthcare centers provide an alternative venue for anxiety prevention, particularly for adolescents who are not actively engaged in the education system or who require holistic support addressing both physical and psychological well-being. This is particularly relevant in semi-urban and rural areas where mental health stigma may discourage families from seeking psychological services. Primary healthcare centers are often the first point of contact for adolescents experiencing somatic symptoms of anxiety, such as headaches, gastrointestinal distress, or

unexplained fatigue, making them an ideal setting for early identification and intervention.

Preventive interventions targeting adolescent anxiety are essential to reducing the risk of long-term mental health disorders. Anxiety prevention education equips adolescents with crucial skills to manage stress and prevent anxiety from escalating into a clinical disorder. Psychoeducation helps them understand anxiety symptoms, triggers, and the importance of early intervention, while cognitive-behavioral techniques (CBT) encourage them to challenge irrational thoughts, reframe negative thinking patterns, and develop effective problem-solving skills. Teaching stress management techniques such as mindfulness, progressive muscle relaxation, deep breathing exercises, and guided imagery can help adolescents regulate their emotions and improve coping strategies (10). Additionally, resilience-building programs aim to strengthen self-esteem, social support networks, and emotional regulation skills, which are essential protective factors against anxiety (11).

Global research highlights the efficacy of these interventions. Studies have demonstrated that school-based anxiety prevention programs can reduce anxiety symptoms by 25-50% within a year, and similar approaches implemented in healthcare settings have shown promising results (12). For instance, community-based programs that integrate psychoeducation, CBT techniques, and relaxation exercises have been linked to lower rates of anxiety and improved overall well-being among adolescents (13, 14). In Sari County, implementing such programs within healthcare centers could provide a structured, accessible, and sustainable approach to addressing adolescent anxiety. By leveraging existing infrastructure and trained healthcare providers, these centers could offer scalable and cost-effective solutions for mental health promotion.

Despite the potential benefits, implementing anxiety prevention education in Sari's healthcare centers presents several challenges. A significant barrier is the shortage of mental health professionals, which may limit the availability of specialized services. Additionally, cultural stigma surrounding mental health issues may deter adolescents and their families from seeking psychological support. There is also a need for training healthcare providers in mental health literacy, as many general practitioners and nurses may not have the necessary expertise to deliver psychoeducational interventions effectively. However, these challenges can be addressed by integrating mental health training into existing professional development programs, utilizing digital resources such as mobile health applications and online counseling platforms, and fostering community awareness through targeted public health campaigns.

Given the high burden of adolescent anxiety in Iran, incorporating mental health education into primary healthcare settings represents a proactive and cost-effective public health strategy. Early intervention not only reduces the likelihood of anxiety disorders persisting into adulthood but also enhances academic achievement, social functioning, and overall well-being. By prioritizing adolescent mental health, healthcare centers in Sari County can play a crucial role in reducing anxiety prevalence, improving youth resilience, and fostering long-term psychological well-being. Expanding these efforts through policy support, increased funding for mental health initiatives, and community engagement will be essential in ensuring that anxiety prevention education reaches as many adolescents as possible, ultimately contributing to a healthier and more productive society.

## Methods

This study employs a comprehensive literature review methodology, synthesizing findings from systematic reviews, meta-analyses, and randomized controlled trials (RCTs) on anxiety prevention education in adolescents. The selection of studies is based on predefined inclusion criteria, prioritizing research that evaluates the effectiveness of preventive interventions in reducing anxiety symptoms, enhancing coping skills, and improving self-esteem or resilience. Databases such as PubMed, PsycINFO, Scopus, and Google Scholar were searched using keywords including “adolescent anxiety prevention,” “psychoeducation,” “cognitive-behavioral interventions,” and “mental health promotion in primary care.” Studies were selected based on relevance, methodological rigor, and publication within the last 15 years to ensure the inclusion of recent evidence.

To assess the efficacy of different interventions, this review examines primary outcomes such as reductions in generalized anxiety symptoms, improvements in worry management and problem-solving skills, and increases in resilience factors such as emotional regulation and social support. Secondary outcomes include the acceptability and feasibility of implementing these interventions in healthcare settings, particularly within resource-limited environments similar to Sari County. Interventions reviewed include school-based and healthcare-based anxiety prevention programs incorporating cognitive-behavioral techniques, stress management strategies, and psychoeducational approaches. Special attention is given to studies that report follow-up outcomes to determine the long-term sustainability of anxiety reduction effects.

Although specific studies from Sari County are not available, we extrapolate findings from global evidence while contextualizing results within the cultural and

logistical factors unique to the region. This includes considering the role of family dynamics, academic pressures, healthcare accessibility, and mental health stigma in shaping intervention effectiveness. The feasibility of integrating such programs into primary healthcare centers in Sari is evaluated based on existing infrastructure, workforce capacity, and potential barriers such as a shortage of mental health professionals and cultural resistance to psychological interventions.

To strengthen the reliability of findings, this study employs a comparative analysis of intervention models from various countries with similar sociocultural contexts, including Middle Eastern and South Asian regions where mental health awareness remains limited. By synthesizing global best practices and adapting them to the specific needs of adolescents in Sari County, this review aims to provide actionable recommendations for policymakers, healthcare providers, and educators seeking to implement anxiety prevention education in primary care settings.

## A Review of Literature

In a previous study, Yani et al. (2024) conducted a systematic review and meta-analysis to evaluate the effectiveness of universal educational interventions in improving mental health literacy and reducing depression and anxiety among adolescents (15). Analyzing 34 randomized controlled trials (RCTs) from eight databases, the review found that while these interventions improved overall mental health literacy, their impact on depression (SMD = -0.06,  $p = 0.01$ ) was minimal, and no significant effect was observed on anxiety (SMD = -0.00,  $p = 0.94$ ). The study suggested incorporating a hybrid delivery model with both healthcare and non-healthcare professionals, skills-based emotional regulation sessions, and extended follow-ups to enhance effectiveness. However, given the low quality of evidence, findings should be interpreted with caution.

In another study, Hugh-Jones et al. (2020) conducted a review and meta-analysis to assess the effectiveness of school-based indicated prevention programs for anxiety in children and adolescents (16). Analyzing 20 randomized controlled trials (RCTs) with 2,076 participants, the study found small but significant reductions in self-reported anxiety symptoms at post-intervention ( $g = -0.28$ ,  $p < 0.05$ ), with benefits persisting at six months ( $g = -0.35$ ) and up to 12 months ( $g = -0.24$ ). However, effects beyond 12 months were minimal ( $g = -0.01$ ). Despite variability between studies ( $I^2 = 78\%$ ) and a high risk of bias, findings suggest that school-based targeted interventions can provide modest, sustained anxiety reduction. Future research

should focus on long-term diagnostic assessments to better evaluate lasting effects.

In a previous study, Werner-Seidler et al. (2016) conducted a systematic review and meta-analysis examining the effectiveness of school-based programs aimed at preventing depression and anxiety in children and adolescents (17). Given that these mental health disorders often emerge during youth, schools serve as a practical setting for delivering large-scale preventive interventions. This review analyzed randomized controlled trials (RCTs) published up to February 2015 across databases such as Medline, PsycINFO, and the Cochrane Library, ultimately including 81 studies with a combined sample size of 31,794 students. Findings indicated that psychological interventions had small but statistically significant effects in reducing depression ( $g = 0.23$ ) and anxiety ( $g = 0.20$ ) immediately after program completion. At 12-month follow-up, the effects remained but diminished slightly, with effect sizes of  $g = 0.11$  for depression and  $g = 0.13$  for anxiety. Subgroup analyses revealed that targeted depression prevention programs yielded larger effects compared to universal interventions, whereas anxiety prevention programs showed similar effectiveness regardless of whether they were universal or targeted. Additionally, externally-delivered programs appeared more effective for depression prevention than those facilitated by school staff, though no such advantage was found for anxiety interventions. Despite these promising results, the overall quality of included studies was rated as poor, with moderate heterogeneity among findings. The study concluded that refining and improving school-based prevention programs could play a crucial role in reducing the burden of mental health disorders and improving public health outcomes.

Feiss and colleagues conducted a systematic review and meta-analysis to evaluate the efficacy of school-based mental health programs designed to reduce stress, anxiety, and depressive symptoms among adolescents (18). Given the increasing prevalence of adolescent mental health issues, school-based interventions have emerged as a potential large-scale approach to addressing internalizing mental health problems. A total of 42 studies, encompassing 7,310 adolescents aged 11–18, met the inclusion criteria for the meta-analysis. Separate meta-analyses were conducted for stress, anxiety, and depression outcomes, with meta-regression used to assess the influence of program type, dosage, sex, race, and age on intervention effectiveness. The findings revealed that stress interventions did not significantly reduce stress symptoms overall, though targeted interventions demonstrated greater effectiveness compared to universal programs. Anxiety interventions significantly reduced anxiety symptoms, with evidence suggesting

that higher program doses may be necessary for universal interventions. Depression interventions also significantly reduced depressive symptoms, though the extent of reduction was moderated by program type, dosage, race, and age group. Despite the effectiveness of school-based programs in reducing anxiety and depression, their effects were not long-lasting. Additionally, stress interventions showed limited efficacy, potentially due to the lack of targeted programs addressing stress as a primary outcome. These findings underscore the need for continued research and refinement of school-based mental health programs to enhance their long-term impact. Implications for practice, policy, and future research are discussed.

Raniti and colleagues conducted a systematic review in 2022 to assess the role of school connectedness in preventing youth depression and anxiety. School connectedness, defined by students' engagement with peers, teachers, and learning, has been recognized as a potential protective factor for mental health (19). However, its effectiveness in preventing or alleviating depression and anxiety remains unclear. The review included 34 longitudinal and two intervention studies, primarily from the U.S., with participants aged 14–24. Most studies found a significant protective link between school connectedness and reduced depressive and anxiety symptoms, though a few reported no association. Both intervention studies showed improvements in depression, one via enhanced self-esteem and another through stronger school relationships. These findings highlight school connectedness as a promising target for mental health prevention. However, further research is needed to determine its impact on remission and to expand studies beyond North America.

In a previous study by Ghaffar and colleagues, researchers investigated the effectiveness of a school-based anxiety prevention program in addressing childhood anxiety, a prevalent mental health condition associated with an increased risk of psychiatric disorders in adulthood (20). This study aimed to assess whether such a program could effectively reduce anxiety symptoms among primary school students compared to a standard school-as-usual control group. Additionally, the study sought to determine the program's impact on worry coping skills and self-esteem. A two-group parallel cluster randomized controlled trial (RCT) was conducted using a single-blinded design, with schools serving as the unit of allocation and individual students as the unit of analysis. The intervention was implemented between May 2016 and December 2017. The primary outcome was anxiety reduction, while secondary outcomes included changes in worry coping skills and self-esteem, assessed three months post-intervention. Data analysis was performed

using a generalized linear mixed model to account for the clustering effect, and subgroup analyses were conducted for students with pre-existing anxiety. A total of 461 students participated in the study. At baseline, no significant differences were observed between the intervention and control groups in anxiety levels, worry coping skills, or self-esteem ( $p > 0.05$ ). The intervention was found to be effective in reducing anxiety symptoms in both the overall sample ( $p = 0.001$ ) and the subgroup of children with anxiety ( $p = 0.001$ ). However, the program did not yield significant improvements in worry coping skills or self-esteem. These findings suggest that school-based anxiety prevention programs can be a valuable approach for reducing anxiety symptoms in primary school students. While the intervention did not enhance worry coping skills or self-esteem, its effectiveness in alleviating anxiety highlights the potential benefits of integrating such programs into school-based mental health initiatives.

In a previous study, Hugh-Jones et al. (2020) conducted a review and meta-analysis to assess the effectiveness of school-based indicated prevention programs for anxiety in children and adolescents (16). The study analyzed 20 randomized controlled trials (RCTs) with a total of 2,076 participants, evaluating targeted interventions designed for children and adolescents with elevated anxiety symptoms. Of the included studies, 18 were suitable for meta-analysis. Findings revealed that these interventions led to small but significant reductions in self-reported anxiety symptoms at post-test ( $g = -0.28$ ,  $p < 0.05$ ), with benefits persisting at six months ( $g = -0.35$ ) and up to 12 months ( $g = -0.24$ ). However, effects beyond 12 months were minimal ( $g = -0.01$ ). Subgroup analyses found no significant differences based on intervention intensity or control type. While the study demonstrated the potential of school-based targeted interventions in providing modest, sustained anxiety reduction, high variability between studies ( $I^2 = 78\%$ ) and a notable risk of bias suggest the need for further research. Future studies should focus on long-term diagnostic assessments to better evaluate lasting effects.

In another study, Sælid et al. (2022) conducted a cluster-randomized controlled trial to evaluate the effectiveness of the MindPower program, a school-based adaptation of the Coping With Depression (CWD) course, in reducing anxiety and depression among Norwegian high school students (21). The study included 1,673 students across 110 first-year classes, with participants completing multiple assessments over five months. Results showed no significant intervention effects, as both intervention and control groups experienced small but significant increases in anxiety and depression symptoms over time. Boys reported consistently lower symptom levels than girls. High

dropout rates and implementation challenges may have influenced outcomes. The study underscores the need for better preparation, teacher training, and realistic expectations in universal school-based mental health programs.

## Discussion

The findings from the reviewed literature highlight the potential benefits and limitations of anxiety prevention education for adolescents, particularly within healthcare settings. Evidence from systematic reviews and randomized controlled trials suggests that structured interventions, particularly those incorporating psychoeducation and cognitive-behavioral techniques, can lead to measurable reductions in anxiety symptoms. These programs, whether implemented in schools or healthcare centers, demonstrate the potential to improve coping mechanisms, emotional regulation, and overall resilience. However, their long-term effectiveness and applicability in specific cultural contexts, such as Iran's Sari County, require further investigation.

One of the key themes emerging from the literature is the variability in intervention outcomes. Some studies demonstrate a moderate reduction in anxiety symptoms immediately post-intervention, with effects persisting for up to a year. However, findings also indicate that beyond 12 months, the benefits tend to diminish, suggesting that booster sessions or ongoing mental health education may be necessary to sustain long-term improvements. Moreover, while school-based programs have been the primary focus of research, healthcare-based interventions remain underexplored despite their potential to reach adolescents who may not be actively engaged in formal education. This gap in research underscores the need to assess the feasibility of integrating such programs into primary healthcare settings, particularly in semi-urban and rural regions like Sari County.

Another important consideration is the effectiveness of universal versus targeted interventions. Studies indicate that targeted programs, designed for adolescents already experiencing heightened anxiety symptoms, tend to yield greater reductions in anxiety compared to universal interventions. This suggests that screening mechanisms within primary healthcare centers could enhance intervention efficacy by identifying high-risk individuals and providing them with more specialized support. However, universal programs still offer value by fostering mental health literacy and equipping all adolescents with preventive coping strategies before anxiety symptoms become clinically significant.

Cultural and contextual factors also play a critical role in shaping the effectiveness of anxiety prevention education. In Iran, societal expectations, academic pressures, and mental health stigma may deter adolescents and their families from seeking psychological support. Gender disparities in anxiety prevalence, with girls often experiencing higher levels of stress due to social and academic expectations, further highlight the need for gender-sensitive intervention designs. Programs implemented in Sari County must therefore consider these sociocultural dynamics to ensure they are accessible, acceptable, and effective for the local adolescent population. Community engagement, parental involvement, and culturally adapted psychoeducational materials could enhance program uptake and success.

Despite the promising evidence supporting anxiety prevention education, several challenges must be addressed to optimize its implementation in primary healthcare settings. A significant barrier is the limited availability of mental health professionals, which may hinder the capacity of healthcare centers to deliver effective interventions. Training general practitioners, nurses, and other healthcare providers in basic mental health education and cognitive-behavioral techniques could be a cost-effective strategy to bridge this gap. Additionally, digital mental health resources, such as mobile applications and online psychoeducational programs, could complement in-person interventions and extend their reach to a broader adolescent population.

The feasibility of integrating anxiety prevention programs into primary healthcare settings also depends on resource allocation and policy support. Governments and healthcare institutions must prioritize adolescent mental health by investing in staff training, public awareness campaigns, and the development of structured intervention protocols. Moreover,

collaboration between schools and healthcare centers could create a more comprehensive mental health support system, ensuring that adolescents receive consistent and reinforced mental health education across different settings.

Anxiety prevention education has significant potential to enhance adolescent mental health outcomes, particularly when delivered through structured and evidence-based interventions. While research has primarily focused on school-based programs, expanding these initiatives to healthcare settings could provide a valuable alternative for adolescents with limited access to school-based mental health support. In Sari County, leveraging existing healthcare infrastructure to implement such programs could help address the growing burden of adolescent anxiety. However, successful implementation will require addressing cultural barriers, enhancing provider training, and ensuring sustained policy support. Future research should focus on evaluating the long-term effectiveness of healthcare-based anxiety prevention programs, with particular attention to their adaptability in diverse cultural and socioeconomic contexts.

## Conclusion

Anxiety prevention education holds promise for improving the mental health of adolescent service recipients in Sari County's healthcare centers. By reducing anxiety symptoms and enhancing coping skills, such programs could mitigate long-term psychological burdens in a culturally sensitive, resource-efficient manner. While challenges like stigma and limited infrastructure persist, strategic implementation and further research can unlock their full potential, offering a model for other regions in Iran and beyond.

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