

Review

Stress-reducing strategies and interventions for gynecology & obstetrics residents: a narrative review

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Abstract: As a result of the high levels of stress and burnout in obstetrics and gynecology residents and its negative impact on their personal and professional functioning, and ultimately on the quality of patient care, attention to the health and well-being of this group of medical students has increased. Numerous strategies have been used to help reduce or cope with stress. This study aimed at identifying effective educational strategies to reduce stress in obstetrics and gynecology residents. For this narrative review, we searched ScienceDirect, Emerald, PubMed, Web of Science, and Google Scholar databases for relevant information sources published from 2013 through 2022. This study retrieved 15 stress reduction strategies for obstetrics and gynecology residents from 9 articles that met the inclusion criteria.

We established that strategies such as stress management training, resilience training, emotional intelligence training, mindfulness practices, team bonding sessions, feedback and reflection sessions, and access to confidential and free psychotherapy and mentoring programs were effective in improving the well-being of residents in this medical field.

Keywords: obstetrics and gynecology residents, residency, educational strategy, stress.

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Introduction

The *USA Today* website has ranked obstetricians and gynecologists among the top 10 most stressful jobs in the United States [1]. For obstetrics and gynecology (OB/GYN) residents, anxiety and burnout are caused by regular exposure to stressors, which can lead to consequences such as loss of performance and productivity, increased absenteeism, change of occupational field, increased costs, decreased patient satisfaction, reduced quality of care, increased medical errors, and personal problems such as mental disorders, drug and alcohol abuse, and even suicide [2-4].

A resident is a medical school graduate with a Doctor of Medicine (MD) degree who is pursuing a postgraduate training program in a specific field such as surgery, internal medicine, pathology, gynecology, or radiology [5, 6].

Research has shown that the stress and mental strain that residents experience in the workplace during their residency can be detrimental to their well-being, mental health, productivity, and quality of patient care [7-9]. Stress is defined as excessive anxiety caused by a difficult situation or by factors triggering it [10]. It occurs when an individual feels that there is a mismatch between the responsibilities and pressures of the job and his or her abilities and needs [7].

OB/GYN training is notorious for its long work hours, high severity in maternity wards, rapid patient turnover, high workload, and off-duty emergency care, which creates a fruitful environment for maladaptive occupational stress and burnout [11, 12].

A study by Slad et al. [13] established that 68% of OB/GYN residents reported exposure to work-related traumatic events that they defined as situations in which they “experienced fear, helplessness, or horror in response to perceived threat of death or damage to someone in their care” of those who reported exposure to trauma, and 18% of residents reported post-traumatic stress disorder (PTSD) symptoms of clinical level [13].

According to many studies, OB/GYN residency is among the most stressful fields among various specialties [7, 14-16]. For example, a study in Jordan [15] and two studies in Iran [7, 16] demonstrated that among 8, 15, and 19 examined medical professional fields, respectively, OB-GYN residents had the highest mean stress score or burnout score.

Given the high risk of stress in OB/GYN residents, which may cause harm to them, their families, the social environment, and the patients they directly care for, it is necessary to identify and manage stressors to minimize the risk of negative consequences of stress [14].

More recent approaches to stress conceptualize stress in terms of a dynamic interaction between the individual and the environment and believe that stress either results from the existence of problematic interactions between the individual and the environment or from the cognitive processes and emotional responses that underlie these interactions [17]. Furthermore, stress is not only a stimulus or response, but also a process in

which an individual can actively reduce its negative consequences using personal and environment-based strategies [18].

Research shows that strategies should be considered to reduce stress and improve the working conditions and training of OB/GYN residents, and recently stress management strategies have been implemented to manage and reduce stress [12, 19-21].

The meaning of stress management strategies is “any purposeful action taken to reduce or alleviate the stress experienced by organizational citizens in the performance of their work functions.” They are classified into three main categories: primary, secondary, and tertiary in studies [22].

Primary strategies focus on the organization and aim to eliminate or reduce stressors in the workplace. Secondary strategies focus on the individual; their goal is to improve both the ability of individuals to cope with stressors and the ability to manage stressful situations. Tertiary strategies also focus on the individual, but the goal of these solutions is to reduce the pain and suffering of people who experience problems caused by stress [22-24].

Recognizing the importance of stress management in medical education, especially for OB/GYN residents, various solutions have been proposed to alleviate stress and improve well-being [25-27]. Educational strategies play a vital role in this context by offering valuable tools to support residents in coping with stress and improving their overall experience [28, 29].

While some stress management approaches have shown potential, others have yielded variable results, thereby highlighting the importance of conducting a comprehensive review of educational interventions tailored for OB/GYN residents [30, 31–35]. Despite the available research on stress-related issues and coping strategies in this population [20, 21, 36, 37], there is a notable lack of a thorough review specifically targeting educational interventions to alleviate stress among OB/GYN residents [25]. Previous reviews have primarily focused on burnout across various healthcare professions.

Existing evidence indicates that review studies have been conducted to evaluate the effectiveness of educational strategies in reducing stress among healthcare professionals, including physicians of various specialties [26].

Table 1. Effective strategies used to manage OB/GYN residents’ stressors in the reviewed articles

First author/ Publication year	Study group	Study method	Tools/Data collection methods	Country	Main findings
Nathan J [21] 2021	Obstetrics and gynecology (OB/GYN) and family medicine (FM) residents	Quasi-experimental design	Pretest and posttest	USA	This study demonstrated the positive impact of a 6-hour stress management and resilience intervention on medical residents
Galaiya R [29] 2020	Different specialties including OB/GYN	Systematic review	–	UK	Intervention on specific psychological factors such as emotional intelligence, resilience, and mindfulness may help reduce stress and burnout
O’Riordan S [12] 2020	Midwives and OB/ GYN residents	Quasi-experimental design	Pretest and posttest	Ireland	Reduction of burnout scores, secondary traumatic stress, and perceived stress in the post-test compared to the pre-test. Reduction in of burnout, secondary traumatic stress, and perceived stress in the post-test vs. the pre-test
Anton NE [19] 2019	General surgery and OB/GYN residents	Randomized controlled trial	Pretest and posttest	USA	A comprehensive mental skills training program involving surgical residents at two institutions was effective in minimizing the decline in technical performance of residents under stressful conditions
Babbar S [20] 2019	OB/GYN residents	Single-arm pilot study	Pretest and posttest	USA	Implementation of an 8-week wellness program may reduce stress
Verweij H [30] 2018	Residents of all medical, surgical and primary care specialties	Randomized controlled trial	Questionnaire	Netherlands	Mindfulness-Based Stress Reduction (MBSR) training program resulted in improvements in personal accomplishment, anxiety, mindfulness skills, and self-compassion, but was not effective in terms of resident burnout
Winkel AF [31] 2018	OB/GYN residents	Prospective qualitative study	Semi-structured interviews	Netherlands	Personal connections with peers (coworkers) and mentors, as well as with patients and work, helped mitigate the stress and conflicts that were present
Wagner B [32] 2017	OB/GYN residents	Interventional trial	Maslach Burnout Inventory (MBI) and the Perceived Stress Scale	USA	A comprehensive resident wellness initiative (increased access to program and department leadership for continuous program improvement, as well as formal mindfulness training focusing on stress reduction techniques, confidential and free access to psychotherapy, group conflict mediation, and involvement of coworkers and faculty in a mentoring program) can provide significant stress reduction
Wen L [33] 2017	General surgery, anesthesia, and OB/GYN residents	Prospective pilot study	Participants were asked to complete a three-part survey measuring stress and other negative emotions, mindfulness, and app usage	USA	A mindfulness intervention delivered via a smartphone app has been shown to improve mood and reduce burnout and stress in health care providers

Table 2. Classification of effective strategies for coping with stressors in OB/GYN residents in the reviewed articles

Classification of strategies	Resulting strategy	Articles that recommend or report the use of each specific strategy	Description
Organizational strategies	1. Wellness program	Babbar S [20] 2019	An 8-week wellness program consisting of weekly 1-hour yoga classes held during reserved learning time, as well as sustenance and exercise for 24 OB/GYN residents. Participants' stress was assessed using pre-tests and post-tests, and post-test results demonstrated a reduction in stress scores [20]
	2. Personal connections with peers, mentors, patients, and work	Winkel AF [36] 2018	A qualitative study explored experiences of residents using well-grounded theory. Eighteen OB/GYN residents were recruited and participated in semi-structured interviews. Results showed that personal connections to peers, educators, patients, and work can reduce residents' stress [31]
	3. Comprehensive mental skills training program	Anton NE [19] 2019	Residents were randomly assigned to mental skills group and control group in a quasi-experimental study. Following training, technical skills were assessed under normal and stressful conditions on a porcine model. The mental skills group outperformed the control group during a high-stress transfer test [19]
	4. Expanded access to program and department leadership		An interventional study was designed to gradually introduce multiple wellness initiatives into an OB/GYN residency program at a large urban university medical center. Wellness initiatives included increased access to program and department leadership for continuous program improvement, formal mindfulness training with an emphasis on stress reduction techniques, along with confidential and free access to psychotherapy, group conflict mediation, and involvement of peers and faculty in a mentoring program
	5. Group conflict mediation		Following program implementation, there was a reduction in the number of residents with above-normal perceived stress scores (49%; P<0.05) [32]
	6. Confidential and free access to psychotherapy	Wagner B [35] 2017	A review study concluded that the severity of stress as a cause of burnout depends on personality and psychological factors such as training in emotional intelligence, resilience and mindfulness [29]
	7. Involvement of peer and faculty in a mentoring program		In a randomized controlled trial, the Mindfulness-Based Stress Reduction (MBSR) training program for residents was conducted. The results showed that the intervention led to improvements in personal accomplishment, anxiety, mindfulness skills, and self-compassion [30]. The other study was a prospective pilot study. Participants were asked to complete a three-part survey measuring stress and other negative emotions, mindfulness, and app usage. The results demonstrated an improved mood and a reduction in burnout and stress in study participants [33]
	8. Emotional intelligence training	Galaiya R [37] 2020	This study conducted a pilot program called Stress Management and Resilience Training for Residents (SMART-R) for family medicine (FM) and OB/GYN residents at an academic medical center. Pre- and post-surveys were conducted and the result showed the effectiveness of the intervention in stress reduction [21]
	9. Mindfulness training	Galaiya R [37] 2020, Wagner B [35] 2017, Wen L. [33] 2017, Verweij H. [30] 2018	The study design was a pilot pre- and post-interventional study. The sample size was limited to the number of midwives and OB/GYN physicians who worked in the maternity ward. Interventions included pocket cards and posters promoting self-care and resilience, team bonding sessions for residents, Recognize and Reflect sessions, and end-of-shift staff meetings for midwives. Results exhibited a reduction in perceived stress scores at post-test [12]
Individual strategies	10. Resilience intervention program		
	11. Stress management intervention	Nathan J [21] 2021	
	12. Pocket cards and posters promoting self-care and resilience		
	13. Team bonding sessions for residents	O'Riordan S [12] 2020	
	14. Recognize and Reflect sessions		
	15. End of shift staff meeting		

However, it should be noted that, to the time of writing this review, no review studies have been identified that specifically examined the impact of educational strategies on reducing stress among OB/GYN residents [26-28].

Therefore, this review aims to fill this gap by identifying and categorizing effective educational strategies aimed at reducing stress among OB/GYN residents. By synthesizing existing knowledge in this medical field, this review seeks to provide valuable insights for future research and practice in addressing the unique stressors faced by residents in this challenging specialty.

Material and Methods

In this narrative review study, English-language articles published in the past 10 years (2013-2022) were systematically searched using keywords such as stress, stressors, burnout,

intervention, educational strategies, improvement, reduction, prevention, coping, obstetrics and gynecology residents. The search was conducted in ScienceDirect, Emerald, PubMed, Web of Science, and Google Scholar databases from October 27 through November 27, 2022.

The inclusion criteria were as follows: English-language articles of all types that focused on educational strategies or interventions to alleviate stress in OB/GYN residents. The study population included OB/GYN physicians/residents, and the publication year ranged from 2013 through 2022. Exclusion criteria encompassed articles in languages other than English, articles that focused solely on burnout or depression without considering stress, studies involving a population other than physicians or OB/GYN residents, and articles that lacked effective educational strategies.

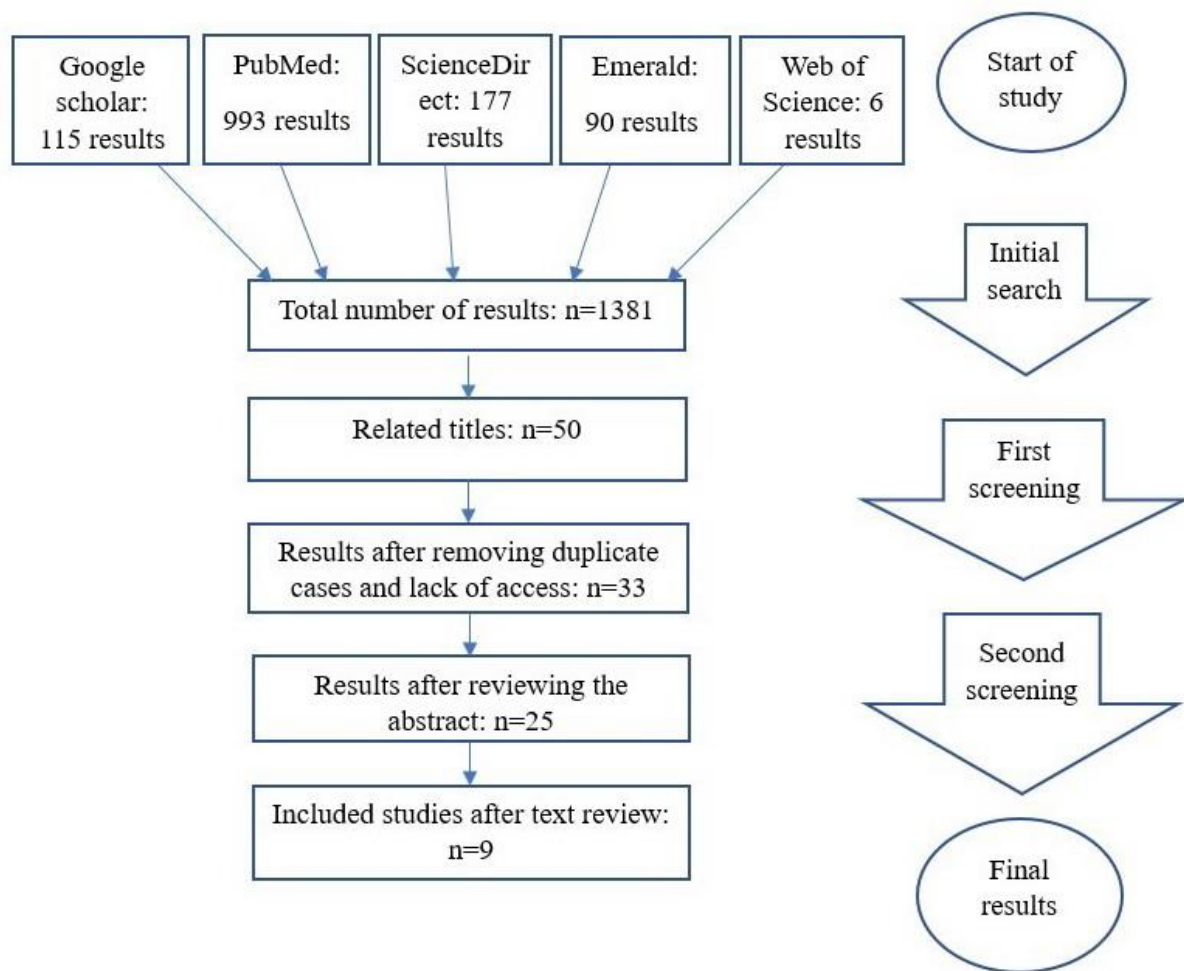


Figure 1. Flowchart of a review of effective interventions and strategies to reduce stress.

The initial search based on keywords yielded 1381 articles. After screening titles for relevance, 50 relevant titles were identified by the first author. After removing duplicates, 33 abstracts were assessed, resulting in the selection of 25 full-text articles for further review based on title and abstract relevance.

Subsequently, both the first and second authors screened the full texts of the 25 selected articles. During this process, 16 articles were excluded and 9 articles met the inclusion criteria for data extraction (Figure 1). Data from these final 9 articles were extracted and written to an Excel file (Table 1). The extracted strategies were then discussed and classified during a group meeting involving all authors. The classification system by Helmand et al. [24] was employed to organize the strategies, with primary strategies classified as organizational strategies and secondary/tertiary strategies classified as individual strategies.

Results

In the current narrative review, all articles related to stress reduction strategies in OB/GYN residents in the past 10 years (2013-2022) were found and analyzed. The results of this study presented in Table 1 show the effective stress reduction strategies in OB/GYN residents in the reviewed articles. The final 9 articles were from the United States (5 articles), the Netherlands (2 articles), England (1 article), and Ireland (1 article).

Effective stress reduction educational strategies for OB/GYN residents

Our results showed that of the final 9 studies reviewed, 3 studies [19, 20, 31] examined organizational strategies, five studies [12, 21, 29, 30, 33] investigated individual strategies, and only 1 study examined both individual and organizational strategies [32]. From the final 9 articles, 15 strategies were obtained, which were classified into two categories: individual (10 strategies) and organizational (5 strategies) (Tables 1 and 2). As the results showed, most of the identified strategies were individual strategies, but the strategies presented in all reviewed articles were effective in reducing stress. From these studies, 5 organizational strategies and 10 individual strategies for reducing stress in OB/GYN residents were extracted (Table 2).

Discussion

Stress among obstetrics & gynecology (OB/GYN) residents

Obstetricians and gynecologists face unique pressures and have high rates of stress and burnout during residency and when they become physicians [31]. According to the results of a study by Oriordan S et al., almost 42-45% of OB/GYN residents had moderate or high levels of emotional exhaustion, 90% of them experienced burnout, while high levels of secondary traumatic

stress were reported by 29% of OB/GYN residents [12]. Wagner B et al. reported that 64% of residents showed signs of burnout, while perceived stress was above normative values in 61% of them [32]

OB/GYN training is notorious for a stressful period of residency due to reasons such as its workload, long shift hours, and the stressful nature of obstetrics and gynecology (providing care and safety while being responsible for two individuals: the mother and the fetus). Despite the widespread reduction in weekly work hours for OB/GYN residents, the levels of stress and burnout among them are high and are associated with negative outcomes such as poor performance, medical errors, depression, and even suicide [12, 20, 31]. There is now a call to develop and implement strategies to help reduce or manage stress during OB/GYN residency training [32].

Classification of stress management educational programs for OB/GYN residents

Attention to stress has moved beyond isolated concepts such as stimulus or response, and stress is now viewed as a process, interactive aspects of which are more accentuated. There is now a growing consensus that stress is determined by the dynamic interaction between the individual and the environment and is often derived from the incompatibility of the individual with the environment or the maladaptive emotional responses that underlie these interactions [17, 34, 35]. The results of this review also implied that many studies have followed this direction.

The results of this review revealed a variety of stress management strategies from the analyzed studies, which mainly focused on individual and organizational strategies. Such diversity of strategies determined by various factors, such as organizational or medical culture and health care systems [26, 36], has been confirmed in the literature from other fields and contexts [26, 36, 37]. In any case, in this review, we classified stress management or stress reduction strategies in OB/GYN residents into two categories.

Organizational strategies focus on the organization and aim at eliminating or reducing stressors in the workplace. These solutions focus on changes in organizational practices, such as changing the curriculum or reducing work hours in a residency. Individual strategies focus on the individual and aim at improving people's ability to cope with stressors and manage stressful situations by increasing their knowledge and skills or to reduce the pain and suffering of people whose stressors have caused them complications. For example, this category includes stress management training, improving emotional intelligence skills, or helping to treat disorders and illnesses that are aggravated by stressors [22-24].

In the reviewed articles, individual strategies were of greater interest than organizational strategies. The former (such as stress management interventions, resilience training intervention/program [21], emotional intelligence training [29], mindfulness training [29, 30, 32, 33], confidential and free access to psychotherapy, participation of peers and faculty in a mentoring program [32], pocket cards and posters promoting self-care and resilience, team bonding sessions for residents, feedback and reflection sessions, and end-of-shift meetings [12]) were presented as effective strategies to reduce stress in OB/GYN residents.

Among the individual strategies, mindfulness training strategy, which has been studied more than others, was reported as an effective strategy in four studies [29, 30, 32, 33]. However, the results of some previous studies in other scientific fields contradicted these findings [26, 38]. Locke R and Lees A pointed out that this strategy is not effective in reducing stress in surgeons: in addition to the costs that this solution may bring to the host organization, there are potential cost implications for the participant per se; therefore, at present, it may not seem the best option for solving this problem [26].

Besides that, in the study by Marco Marotta et al., the impact of mindfulness-based stress reduction (MBSR) training on stress in Italian healthcare professionals was assessed. The results of the pre-test and post-test did not show a significant difference, and stress was moderate in all groups [38]. Of course, these differences in findings seem natural due to the different contexts, conditions and characteristics of the participants.

In addition, a randomized controlled trial was conducted to determine the effectiveness of MBSR in reducing burnout in residents of all medical, surgical and primary care specialties. Its results did not confirm the effectiveness of MBSR in reducing emotional exhaustion in residents [30].

Cohen Katz et al. in their *Effect of MBSR on Stress and Burnout in Nurses* study found similar results to ours, concluding that mindfulness training reduced stress in the participating nurses [39]. Also, a study by Chiara Buizza and colleagues indicated that the MBSR strategy was effective in reducing stress in medical students [36]. Thus, it can be stated that the use of mindfulness training strategy and other individual strategies that were identified in this review may help reduce stress in OB/GYN residents and other healthcare professionals, although the contextual conditions and opportunities for implementing the strategies should be considered.

The results of our review also demonstrated that although organizational strategies were less addressed in the analyzed articles, some of them were found effective in reducing stress in OB/GYN residents [19, 20, 31, 32].

An 8-week wellness program consisting of weekly 1-hour yoga classes held during reserved learning time, as well as sustenance and exercise for 24 OB/GYN residents, and the participants' stress was assessed using pre-tests and post-tests. The results of the post-test showed a reduction in stress scores [20]. In a qualitative study, Winkel AF et al. examined the residents' life experiences using well-grounded theory and concluded that personal connection with peers, educators, patients, and involvement in work experiences can reduce the stress of OB/GYN residents [31]. Therefore, increase in residents' experiences can improve their skills in dealing with stressors if it is accompanied by proper relationships at work (with other residents, patients, and caregivers).

Similar conclusion has been made in a study by Wagner B et al.: increasing access to program and department leadership and mediating group conflicts yielded lessened stress in OB/GYN residents [32].

These findings confirmed that interactions of OB/GYN residents with each other and with other people associated with them can affect their stress. Such an outcome was identified in a study by Mirzaee et al. as an inappropriate behavior serving one of the major stress factors in residents [25]. Hence, strategies that

help improve residents' interactions and behaviors can be effective in reducing their stress.

In a quasi-experimental study by Anton NE et al, residents underwent a comprehensive mental skills training program. After training, their technical skills were assessed under normal and stressful conditions on a porcine model. The mental skills group outperformed the control group during a test under high stress conditions [19].

The results of this study are supported by previous studies. For example, in a study by Le Fevre et al, secondary interventions (individual strategies) were the most common type of intervention. This type of intervention is very diverse and ranges from short-term meditation training sessions to multifaceted approaches including training and feedback over a period of several weeks to several months [22].

A study by Zhang et al. examined a wide range of individual, organizational, and combined interventions to reduce burnout in physicians and nurses and concluded that most effective interventions were individual interventions, albeit the quality of some studies was flawed [40].

Kirubarajan et al. reviewed strategies to reduce burnout among female residents and concluded that the limited studies conducted among residents combined preventive interventions (such as yoga, nutrition programs, or traditional medicine initiatives) and treatments (such as counseling or coaching), and the vast majority of these interventions were individual interventions [41].

In summary, this review has revealed fifteen preventive strategies to improve exposure to stress or reduce stress in OB/GYN residents, but no response strategies were noted. No data were collected on biochemical parameters of stress. Only two studies were randomized controlled trials [19, 30], only one study assessed blood pressure, heart rate, and weight as outcome measures of the strategy effectiveness [20], while other studies assessed effectiveness via questionnaires or interviews and were based on participant mentality.

In addition, the effects of the intervention on participants' academic/clinical performance were not assessed, with the exception of one in the remaining studies. The latter, however, did not control for influencing factors such as education level and experience, other knowledge, and specific characteristics of contexts and organizational culture. Based on this fact, we point out that there is a lack of detailed studies, such as randomized controlled trials, in stress reduction strategies.

For all these reasons, focusing on the multidimensional solutions based on all three types (primary, secondary and tertiary) of stress management strategies that cover both prevention and treatment of stress can help OB/GYN residents achieve better conditions in dealing with stress and stressors. As a result, residents' productivity and the quality of patient care and clinical practice will be improved.

The results of this review overall showed that there is a trend towards the use of individual educational strategies to reduce stress in OB/GYN residents, since this type of strategy is quite effective. This trend may have been revealed due to the evidence of the effectiveness of this intervention type and also due to the ease of its implementation compared with organizational type of stress reduction strategies.

It is important to remember that problems such as burnout or stress in OB/GYN residents are multifaceted issues and multiple factors contribute to their occurrence; hence, it seems that an effective intervention should include a wide range of stressors and a combination of solutions or appropriate interventions should be considered.

Future research could further explore the influence of contextual factors (such as components of medical culture and more comprehensive health care systems) on the use and acceptability of specific strategies. Due to the scarcity of randomized controlled trials in this field (only two studies were found), they should be conducted more often in order to more objectively and in-depth examine the effectiveness of these stress reduction strategies.

Furthermore, given that the quantitative studies included in our review examined the effectiveness of strategies using small sample sizes and employed different tools to assess the effectiveness of the strategy, it seems that more extensive studies with identical and appropriate instruments are needed to achieve a more comprehensive picture and more accurate results.

The present study, as one of the first review studies on stress reduction strategies in OB/GYN residents, may provide appropriate information for future researchers, educational planners, caregivers and practicing physicians of OB/GYN residency, but it is limited in terms of used databases and solely English language articles selected for the review, which suggests that future researchers should deal with such limitations.

Conclusion

This review highlights the overwhelming preference for individual interventions as the preferred stress reduction strategy among OB/GYN residents. The identification and classification of effective stress reduction strategies in this study offers valuable information for residency planners and practitioners, allowing them to select and implement the most effective solutions to enhance an ability of residents to cope with stressors. By creating better learning and patient care environments, these interventions can potentially improve the overall well-being and productivity of OB/GYN residents, ultimately enhancing the quality of healthcare delivery.

Conflict of interest

This review was a part of the doctoral thesis proposal sponsored by the Medical Education Research Center of Isfahan University of Medical Sciences, Isfahan, Iran, with the code of ethics IR.ARI.MUI.REC.1400.092. The authors declare that they have no conflicts of interest.

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