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Review Article

Identification of Residents' Stressors: A Review Study

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Abstract

Background: High level of stress experienced by residents is one of the important factors of the reduction in their efficiency and the increase in their error rate and poor clinical performance.

Objectives: The present study was conducted to review, identify and categorize the most important stressors of residents.

Methods: In this narrative review study, English articles were reviewed by electronic search of Education Resources Information Center (ERIC), PubMed, ProQuest, Scopus and Google Scholar search engine over the last 10 years (2013-2022).

Results: Based on the data, 89 stressors were extracted from 12 articles, and then divided into six categories of "stressors related to care and treatment, stressors related to interpersonal and intrapersonal communication, social stressors, stressors related to course management and planning, stressors related to teaching and learning and stressors related to residents' drive and desires".

Conclusion: The identification and categorization of stressors in the present study made it possible that the planners and practitioners of residency courses can design and implement effective solutions to reduce the negative impacts of residents' stressors and, as a result, provide better conditions for their learning and training during the course.

Keywords: Stress, Stressors,Residents, Residency

Background

In most references, stress is defined as a state of imbalance between a rigorous environment and a person's ability to cope with its pressure (1). According to the definition of the World Health Organization (WHO), stress is a response that people may suffer when faced with demands and pressures that do not match their knowledge and abilities, and challenge their ability to cope (2). In fact, stress is physical or mental tension caused by physical, psychological or emotional factors and can have an external or internal origin (3). Stress-causing factors are often called stressors, and stress is the initial response of people to these factors (4). Severe stress, especially if it is chronic, may have consequences such as impaired brain function, including memory and thinking, and disruption of the brain's self-regulation system. In addition, high levels of stress can lead to physical problems such as heart palpitations, high blood pressure, headache, vision loss, digestive problems and psychological problems such as anger, irritability, anxiety, insomnia, depression and burnout in medical professionals (5).

Education at various levels of the medical field is always accompanied by stress, and residents are among the learners who, for various reasons, in addition to the stress related to the profession, face stressors related to education and learning during their studies (6). The available evidence also shows the prevalence of stress and exposure to stressors at this level of medical education. A study in Saudi Arabia reported the level of stress (relative-very severe) of residents in more than 68% (7) and another study in Portugal reported this rate as 50% (8).

The study results of Castelo-Branco et al. showed that more than 58% of residents (9) and that of Sepehrmanesh and Ahmadvand indicated that 96% of residents had burnout symptoms (10). While other

studies have clearly shown a significant relationship between stressors and the level of depression in residents (11).

In Iran, studies on different medical departments show that 42.7% of employees have serious mental health problems and more than 51% have severe work-related stress, leading to significant absences from work (12). Also, the study results of Farhangi and Khajeh Nasiri indicated that in addition to problems such as anxiety and depression, nearly 34% of residents had severe-very severe stress (13). Bahrainian et al. also in a study concluded that 75% of residents had mild-severe stress (14).

Given that stress is common during residency is well documented in the relevant literature (15). The results of the studies show that stress, in addition to negative personal consequences (physical and psychological) for the residents themselves, has negative impacts on the interactions between the medical team and patients, learning activities, the progress of the residents' performance in various fields, and finally, the quality of patient care (9, 10, 13, 16, 17).

KEI et al., while confirming stress in residents, emphasize that doctors who work under stress can be harmful to themselves, colleagues, and patients as a result of reduced performance (18). Other studies have considered negative impacts such as anxiety, depression, drug abuse, despair and even suicide attempts in the personal dimension and cases such as burnout, reduced empathy, dysfunction and increase in medical errors in the professional dimension, caused by stress (19-21).

Stress during the residency is known as a factor affecting the efficiency, error rate, burnout and health of doctors and plays an important role in causing mental diseases (14, 22). In addition, stress can negatively affect clinical performance. Because it affects the functioning of the brain, especially disrupts the performance of tasks that require careful attention, active memory, and retrieving information from memory to make sensitive decisions (23).

Various stressors have been proposed in medical education courses from general medicine to the residency and the end of education and then employment and work for doctors (6) and researchers have categorized various factors in accordance with the research conducted. Kaufman et al. classified medical students' stressors into six categories of "factors related to performance and evaluation, time limit and workload, interpersonal and intrapersonal interactions and relationships, financial concerns, ambiguity or feedback concerns, and others" (24). Johnson et al. mentioned four categories of stressors including "context, learning tasks, communication and clinical scenario" (25).

Although Van Kerkhoven et al. classified residents' stressors into two categories of "stressors that are directly related to clinical work and stressors that are indirectly related to clinical work" (23), Jiang et al. mentioned financial income, workload, uncertain long-term career future, insufficient family support, workplace (contact with patients), relationships with colleagues and professors (26). In a study by Ahmadinia et al., "subject-specific stressors, interpersonal and intrapersonal relationships, personal stressors and stressors related to the educational atmosphere" were also considered (27).

Although significant researches have been conducted in the field of residents' stress in other countries (20, 21, 23, 26), there have been few studies in Iran, especially on residents' stressors. On the one hand, these studies have not provided a complete classification that includes all residents' stressors, and on the other hand, different and in some cases inconsistent results have been obtained (6, 14, 28). Accordingly, reviewing the study results in order to summarize and achieve a comprehensive classification of residents' stressors is considered as a research necessity.

Given the importance and position of residency in the training of efficient doctors and their very important role in the health of patients and society, as well as the importance of addressing the issue of resident stress in the curricula emphasized by regulatory organizations such as the Accreditation Council for Graduate Medical Education (ACGME)) (20, 22), the present study was conducted to identify and categorize the most important stressors of residents.

Objectives

The present study was conducted to review, identify and categorize the most important stressors of residents.

Methods

In this narrative review study, English articles were reviewed by electronic search of ERIC, PubMed, ProQuest, Scopus and Google Scholar search engine over the last 10 years (2013-2022) using the keywords "stressors", "stress*, tension*, nervousness*, anxiety*, pressure*, residents*, physician*, and doctor*" and AND and OR operators during one month since 2022/02/22 to 2022/03/23.

Inclusion criteria included English language, type of articles (quantitative, qualitative, interpretative and review), access to full text and study population (residents). The language of the article other than English, the type of articles (other than quantitative, qualitative, interpretative and review articles), including proceedings, letters to the editor, lack of access to the text of the articles, not related to the topic, conducting the study in a group other than residents. and publication year outside the time period were also considered as exclusion criteria.

Articles resulting from keyword search (n=4092) were first reviewed by the first author in terms of title relevance, and 58 relevant titles were identified. After excluding duplicate titles and articles without full text, 46 abstracts were reviewed. Finally, the full text of 28 articles was reviewed by the first author and second authors, of which 12 articles were found suitable for information extraction (Figure 1).

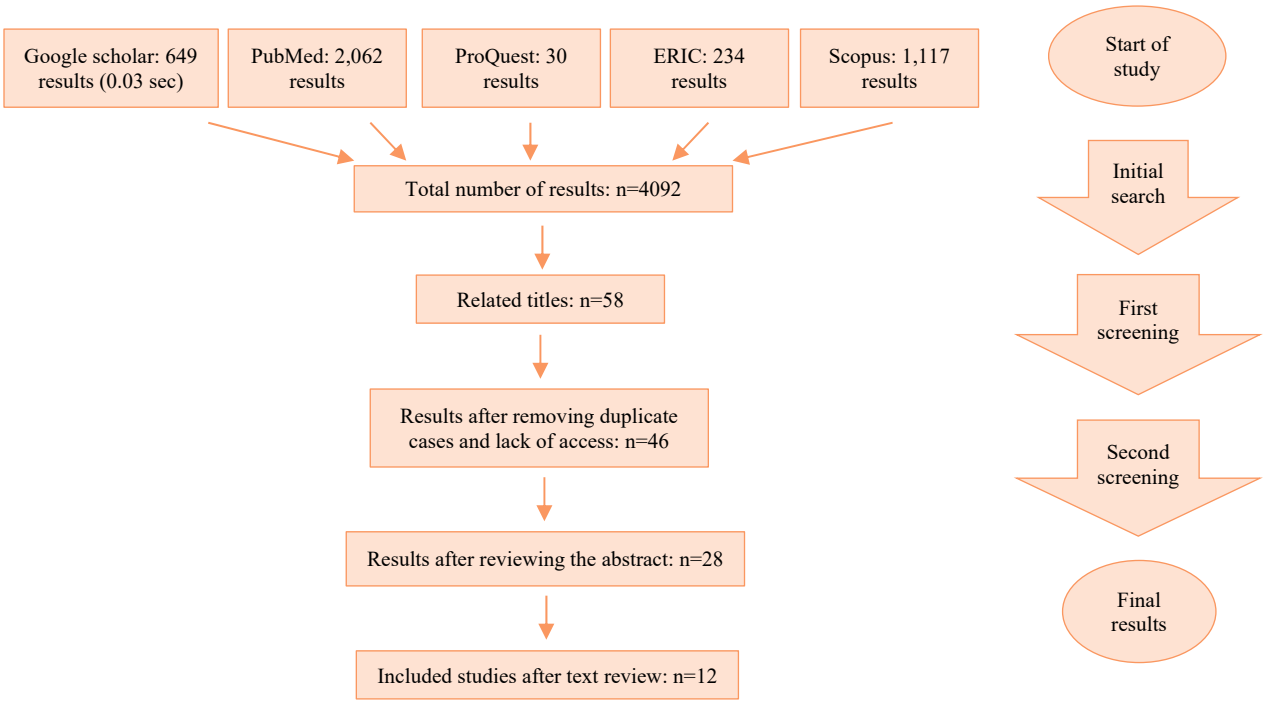

Figure 1. Flowchart of the review study of stressors of residents

Then, the information of these articles, including the title, year of publication, authors' names, type of study, the study population, and the stressors identified in the study, were recorded in the relevant columns in the Excel file (Table 1).

In this step, the obtained list of stressors of residents was discussed in a group meeting with the presence of all authors, and it was decided to use a comparative approach to categorize them. Thus, the six categories of medical students' stressors in a study by Yusoff in Malaysia (29) were used with modification. In this study, the stressors of medical students are divided into six categories of academic stressors, stressors related to interpersonal and intrapersonal, stressors related to teaching and learning, social stressors, stressors related to Drive and desire, and stressors related to group activities" (29).

Given the difference of some stressors in residents compared to medical students, in the present study, the category of "academic stressors" was changed to "stressors related to care and treatment" and, the category "stressors related to group activities" was changed to "stressors of management and course planning". During two group meetings with the presence of the authors, the stressors of the residents extracted from the 12 final articles were categorized into the six mentioned groups.

Results

The results of Table 1 show stressors of residents in the reviewed articles. Thus, the final articles are presented in the order of the year of publication. 12 final studies were conducted in Finland, Pakistan, Nepal, England, China, America, Colombia, Qatar, Portugal, Malaysia, and two in Iran.

Table 1. Stressors of residents in the reviewed articles

Results (identified stressors)	Studied group	Tool	Method	Title	Country	Reference
Managing a pediatric emergency, performing an unusual technical procedure in an acute situation, managing a patient with acute pathology, difficult communication with other health care personnel, dealing with an aggressive patient, leading challenging teamwork in an acute setting, difficulty communicating with the patient. or his relatives, pre-hospital work (with limited information, resources or people), performing a routine technical procedure in an acute situation, giving bad news, performing non-clinical work in addition to clinical work, lack or insufficient interaction with the supervisor or coworker, frequent interruptions during work, full waiting room or long waiting time, managing multiple patients at the same time, working alternating shifts, night and / or long shift	Seventy-six emergency residents	Questionnaire	Cross-sectional	Stress levels of Flemish emergency residents and the implications for clinical practice and education	Finland	Van Kerkhove et al. (23)
Long working hours, too little personal time, overwork, inadequate sleep, inadequate knowledge and skills, interaction with anxious relatives of patients, dealing with ethical dilemmas and patient mortality, conflict of organizational policies with resident program requirements and policies, increasing demand for services and administrative work, working hours more than 100 hours per week, lack of specific time between care services and training, lack of human resources, ambiguity between the expectations of professors and residents, program requirements in addition to the requirements of the accreditation and certifying organization, non-supportive attitudes of faculty members or senior residents such as giving negative feedback, using harsh or derogatory words, not providing learning opportunities for residents and harassing or intimidating attitudes towards residents, lack of quality time for self or family, lack of knowledge about organizational systems and resources	Residents of the Department of Surgery, Aga Khan University, Pakistan	Questionnaire. Focus group and survey tool for residents' preferred coping strategies	Mixed	Stress and coping among surgery residents in a developing country	Pakistan	Riaz et al. (30)
Activities Related Stressor, Academic Related Stressors, Interpersonal & Intrapersonal Related Stressors, Teaching and Learning Related Stressors, Social Related Stressors, drive & desire related stressors and group activities related stressors	Six hundred fifty-one (273 residents and 378 medical students)	MSSQ-20	Cross-sectional and questionnaire	Depression, anxiety, and burnout among medical students and residents of a medical school in Nepal: a cross-sectional study	Nepal	Pokhrel et al. (31)
Poor work-life balance, concerns about patient care, work duties (assignments, responsibilities, workload, etc.), background (level of education), poor career development, type of specialty, inappropriate workplace, financial concerns, demographic factors (gender, cultural background, cultural characteristics, etc.), perceived or reported low mental or physical health	Learners of different levels of medical field from intern to resident	-	systematic review and meta-analysis	Factors Associated with Burnout and Stress in Trainee Physicians: A Systematic Review and Meta-analysis	UK	Zhou et al. (32)
Insufficient income, workload, uncertain career future, family support, workplace (facing patients), communication with colleagues and professors	Five hundred residents in Shanghai General Teaching Hospitals	Paper questionnaire	Cross-sectional	Prevalence of stress and its determinants among residents enrolled in China Standardized Training Program for Resident Doctor (C-STRD) program: A cross-sectional study	China	Jiang et al. (26)

Results (identified stressors)	Studied group	Tool	Method	Title	Country	Reference
Stress of gender preference in some fields, the nature of the profession, lack of specialized knowledge, the occurrence of medical errors, curriculum problems, lack of effective communication, language and cultural differences, conflict between personality traits and expertise, work-life imbalance due to roles and multiple responsibilities, conditions and long working hours, ineffective support for residents	Residents of hospitals affiliated to Tehran University of Medical Sciences (Imam Khomeini, Sina, Shariati, Mohib Yas and Children's Medical Center)	Interview	Qualitative	Medical residents' viewpoint about the effective stressors on professional identity formation during residency in Tehran University of Medical Sciences: A qualitative study	Iran	Ahmadinia et al. (27)
Inadequate sleep, lack of time for personal/family life, emotional pressure caused by facing the disease and pain of patients, being away from family and friends, financial pressure, matching the residency with important life events (marriage and childbearing)	Residents and medical students	-	Review	Medical student and resident burnout: a review of causes, effects, and prevention	USA	Mian et al. (21)
Role conflict, role ambiguity and role overload	Three hundred eleven residents with different specialties in Shiraz University	Questionnaire	Cross-sectional, analytical-descriptive	Occupational stress among medical residents in educational hospitals	Iran	Ebrahimi and Kargar (28)
Giving too much autonomy and too many opportunities for participation by supervisors (too much freedom in cases where residents are not ready to accept the necessary responsibility or have not received adequate training), clinical supervisors of residents sometimes deliberately limiy opportunities to participate in patient care or independence in decision-making	Residents	Interview	Qualitative grounded	Dealing with the tension: how residents seek autonomy and participation in the workplace	Columbia	Olmos-Vega et al. (33)
Workload, workplace relationships, hospital system, patient care, general workplace, achievement stress, health/personal care, time management problems, family and family responsibilities, local context, and others (past life events, cases not controlled by a person, the words of others)	one hundred fifty residents	Open and closed answer questionnaire	Mixed	Burnout and sources of stress among medical residents at Hamad Medical Corporation, Qatar	Qatar	Abdelhamid et al. (34)
Complex patients, complex surgical interventions, predicting problems with intubation, working outside the workplace with different teams and equipment, relationships with surgeons, relationships with the anesthesia team, not having good working conditions, inability to keep yourself up to date, organizing the anesthesia department, little time or difficulty in scheduling	Seven hundred ten anesthesiologists and residents	questionnaire	Cross-sectional	Stressors in anaesthesiology: development and validation of a new questionnaire	Portugal	Lapa et al. (35)
Fear of making mistakes, time pressure and difficulty in meeting deadlines, working with incompetent and uncooperative colleagues, lack of appropriate rest rooms and other facilities for residents, lack of incentives and promotions, feeling of low income, feeling of insufficient knowledge and skills to meet work demands and goals, high workload and stress, impact of work duties on personal and family life, insufficient skills to deal with more difficult aspects of work problems, worry about financial problems, lack of support and unfair evaluation by supervisor, working outside competence, fear of contagion, lack of resources, feeling insecure, difficulty in maintaining relationship with supervisor	Two hundred five residents (medical, obstetrics, gynecology, surgery, emergency medicine, pediatrics and orthopedics)	MBI-HSS	Cross-sectional and questionnaire	Emotional Burnout, Perceived Sources of Job Stress, Professional Fulfillment, and Engagement among Medical Residents in Malaysia	Malaysia	Al-Dubai et al. (36)

MSSQ-20: Medical Student Stressor Questionnaire-20

Discussion

The results of the present study generally indicated that stress is one of the basic problems of residents and that several factors affect its occurrence (6, 10, 13, 23). The review of the obtained articles showed that despite the differences in stressors and classifications, as well as the spatial dispersion of studies, the attention of researchers in different countries, including in our country, to the issue of residents' stress is increasing in recent years (6, 27, 28).

In the present study, the stressors of the residents were extracted from the reviewed articles and classified based on the revised classification model of the stressors in the medical students' stressors questionnaire (MSSQ) (29). Accordingly, the most important stressors of residents (Table 1) were classified into six categories, which are described in detail below.

Stressors related to care and treatment

The stressors related to this category include managing emergency situations, performing an unusual technical procedure in acute situations, performing a routine technical procedure in acute situations, managing a patient with an acute and life-threatening pathology, performing non-clinical work alongside clinical work (23), excessive work or workload and high anxiety, responsibility and concern about patient care (emotional pressure caused by exposure to patients' diseases and pain/inability to treat or relieve patients' pain completely), the occurrence of medical errors (incorrect clinical procedures, fear of patient death, and fear of revealing the error), undesired workplace (involvement with patients) and the stressful nature of some fields such as surgery or gynecology (21, 23, 26-28, 30-36).

As it is found, high workload was mentioned as an important factor of stress in most of the articles.

Stressors related to interpersonal and intrapersonal communication

The most important stressors of residents in this category can be the difficulty of communicating with other health care workers (nurses, senior residents, consultants, etc.), facing aggressive patients, or the difficulty of communicating with the patient or his relatives, giving bad news, working with incompetent and uncooperative colleagues, lack of or insufficient discussion with supervisor or co-workers, frequent interruptions during work, difficulty in maintaining relationship with supervisor, harassing or intimidating attitude towards residents, lack of support and unfair evaluation by the supervisor, conflict with ethical issues, lack of effective communication (inappropriate interaction between residents, pressure caused by professors, and lack of proper doctor-patient communication), simultaneous management of several patients, and perceived or reported low mental or physical health (23, 26-28, 30, 32, 34-36).

Social stressors

According to the results of the reviewed articles, the most important stressors in this category include pre-hospital work with limited information, resources or people, patient mortality, role ambiguity (not well-defined tasks) and role overload (a large number of tasks and daily workload for the available time and other limitations in performing heavy tasks expected and responsibility for the health of patients), role conflict (such as conflict between supervisors' duties or expectations of doctors and patients), family support responsibility, cultural differences with colleagues and patients, the impact of work duties on personal and family life, being away from family and friends, the simultaneity of residency with important life events (marriage, childbearing, etc.) and the many roles and responsibilities of residents (responsibility for society, responding to patients, living together, family affairs and the role of learners and professors) (21, 23, 26-28, 32, 34, 36).

Stressors of course management and planning

The stressors identified in this category include working in alternating shifts, night or long shifts, long working hours with no set time between care services and training, too little personal time and lack of quality time for oneself and / or family, health/personal care (inadequate sleep, weight gain and not having time for exercise, and not having a strong relationship with God), time management problems, time pressure and difficulty in meeting deadlines, working outside one's competence, lack of time for personal/family life, curriculum problems (curriculum changes, lack of curriculum supervision, and lack of knowledge of expectations), workplace conditions and hours (overcrowding and insufficient time for patient care, inadequate response to physiological needs, and changes in social and family relationships), inefficient support for residents (low income, inadequate welfare and housing, inadequate psychological support from the system and family), full waiting room or long waiting time of patients, conflict of organizational policies with residency requirements and policies (e.g., hospital expectations to continue caregiving responsibilities when teaching activities should be performed), increasing demand for services and executive work in the faculty that leaves little time for academic activity, lack of knowledge of resident systems and organizational resources, the lack of appropriate rest rooms and other facilities for residents and the difficulty

of organizing the ward (21, 23, 27, 30, 31, 34-36). The stressors related to curriculum were perhaps the most important stressors in this category and were present in most of the reviewed articles.

Stressors related to teaching and learning

The stressors in this category include undesired knowledge and skills, inconsistency and ambiguity between the expectations of professors and residents, non-supportive attitudes of faculty members or senior residents such as providing negative feedback, using harsh or derogatory words, not providing appropriate learning opportunities for residents, giving too much autonomy by supervisors, in cases where residents are not ready to accept responsibility or have not received enough training, and not providing appropriate opportunities to participate in patient care, both were residents' stressors, and success stress (expectation of success in exams, passage of time and feeling incompetent to act independently, and trying to maintain one's current level in the course), lack of incentives and promotions, insufficient skills to deal with more difficult aspects of work problems, evaluation methods [open /closed, Objective Structured Clinical Examination (OSCE), based on the workplace, etc.], obtaining poor grades in the exam, rating methods, academic schedule, large volume of material to study, difficulty in understanding the content, lack of time to do revision, the difficulty of answering questions presented by professors, exam systems (face-to-face, electronic, simulation, etc.), lack of specialized knowledge (lack of study time, fear of wrong answers to senior residents' questions and year lower) (27, 28, 30, 31, 33, 34, 36).

Stressors related to Drive and desire

In this category, the number of stressors was less than the previous five categories, but in terms of importance, they were not less important. These stressors include fear of disease spread, lack of resources, feeling of lack of safety while working in the internship period, feeling of insecurity in the future job, uncertain long-term career future, fear of making mistakes, worry about financial issues/feeling of low income, the contrast between personality traits and expertise (defective assistant recruitment regulations, disinterest in expertise) and poor career development (weak educational opportunities, professional development, and job security) (21, 26, 27, 32, 36).

The present study, as one of the first review studies on stressors of residents in Iran, can provide suitable information for future researchers and educational planners of the residency, but the focus on limited databases and only English articles was one of the limitations of the study. So, it is suggested to pay attention to this issue in future research.

Conclusion

According to the results of the present study, many factors cause stress in residents, the most important of which are divided in six categories of "stressors related to care and treatment, stressors related to interpersonal and intrapersonal communication, social stressors, stressors related to course management and planning, stressors related to teaching and learning, and stressors related to residents' Drive and desire. Identifying and categorizing the stressors of residents makes it possible for the planners and practitioners of residency to design and implement effective solutions to reduce the negative impacts of these factors, and as a result, provide better conditions for learning and training during the course.

Supplementary material(s): is available here [To read supplementary materials, please refer to the journal website and open PDF/HTML].

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