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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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PREVALENCE AND FACTORS OF PROFESSIONAL BURNOUT AMONG PRIMARY HEALTHCARE WORKERS IN THE REPUBLIC OF KAZAKHSTAN: RESULTS OF A NATIONAL STUDY

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Abstract.

Background: Professional burnout is a significant issue in healthcare, particularly among primary healthcare (PHC) workers. This study aims to assess the prevalence and contributing factors to professional burnout among PHC workers in Kazakhstan, a country undergoing healthcare reforms and the implementation of new medical care standards.

Methods: This cross-sectional study was conducted from 2021 to 2023 across 324 medical organizations in Kazakhstan, including 232 organizations in 2021, 76 in 2022, and 16 in 2023. The study involved 10,459 participants: 2,595 doctors, 5,612 nurses, and 2,252 healthcare managers. Data were collected using a shortened version of the Maslach Burnout Inventory (MBI) questionnaire, assessing emotional exhaustion (EE), depersonalization (DP), and personal achievement (PA). Statistical analysis was performed using IBM SPSS Statistics version 22, employing binary logistic regression to evaluate the impact of various factors on burnout indicators.

Results: The study found that young PHC workers aged 18-39 exhibited the highest levels of emotional exhaustion, with mean EE scores of 3.81 ± 0.45 for doctors, 3.72 ± 0.44 for nurses, and 3.72 ± 0.44 for managers. In contrast, workers over 60 years old reported lower EE levels: 3.28 ± 0.40 for doctors, 3.30 ± 0.40 for nurses, and 3.38 ± 0.41 for managers. Female PHC workers demonstrated lower risks of EE (OR=0.80, 95% CI [0.66, 0.97], p=0.022) and DP (OR=0.79, 95% CI [0.65, 0.96], p=0.025) compared to males, but also reported lower PA levels (OR=0.81, 95% CI [0.67, 0.99], p=0.027). Additionally, managers with postgraduate education had higher risks of EE (OR=1.25, 95% CI [1.05, 1.50], p=0.015), DP (OR=1.28, 95% CI [1.06, 1.54], p=0.013), and PA (OR=1.34, 95% CI [1.10, 1.63], p=0.015). Regional differences were also significant, with the highest PA levels observed in the Turkestan region (OR=1.4, 95% CI [1.14, 1.71], p=0.011), and the highest EE levels in Pavlodar (OR=1.33, 95% CI [1.11, 1.60], p=0.010).

Conclusions: The findings highlight significant variability in burnout levels among PHC workers in Kazakhstan, influenced by age, gender, education level, work experience, and geographic region. Younger workers and those with less experience are at higher risk of burnout, while regional disparities suggest the need for tailored interventions. Addressing these factors is crucial to improving job satisfaction and mental well-being among PHC workers in Kazakhstan.

Key words. Professional burnout, primary healthcare, emotional exhaustion, depersonalization, personal achievement, Kazakhstan, Maslach Burnout Inventory.

Introduction.

Professional burnout is one of the most pressing issues in healthcare, especially among primary healthcare (PHC) workers [1,2].

PHC is work that requires significant physical, emotional, and cognitive effort [3,4]. Primary healthcare (PHC) personnel represent the frontline of medical services in any country. They spend a significant portion of their time addressing urgent and complex cases and often have to deal with the aggressiveness of patients [5]. Constant interaction with patients, a high level of responsibility, and frequent stressful situations lead to emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishment (PA) among healthcare workers [6]. Professional burnout is defined as "the extent of physical and psychological exhaustion experienced by a person in relation to their work" [7]. The potential consequences can be serious for patients, doctors, and staff, as burnout is associated with a decline in the quality of medical care, reduced patient satisfaction, decreased patient safety, shortened working hours for employees, and increased staff turnover [8].

Numerous studies have shown that the prevalence of burnout varies across different countries, and it can be challenging to generalize the findings from high-income countries to low- and middle-income countries due to cultural differences that may influence the factors associated with burnout and its prevalence [9]. A previously published study shows that among primary healthcare professionals, regardless of their job responsibilities, the overall burnout rate ranges from 6% to 89% [10]. In Kazakhstan, the issue of professional burnout among doctors, nurses, and healthcare managers is particularly acute in the context of healthcare system reforms and the implementation of new standards of medical care delivery [11]. A previous study on the level of burnout among PHC workers in eight regions revealed high levels of burnout [12]. However, a large-scale study on the prevalence of professional burnout among PHC workers across all of Kazakhstan has not yet been conducted.

In this regard, the present study aims to examine the prevalence and factors contributing to the development of professional burnout among PHC employees in various regions of Kazakhstan.

Materials and Methods.

Ethical issues:

The study was approved by the Local Ethics Committee of the S.D. Asfendiyarov Kazakh National Medical University, Almaty, Republic of Kazakhstan (protocol of the Local Ethics Commission No. 12 (118) of 28.09.2021).

Study setting:

The study was conducted within the framework of the program "National Program for the Implementation of Personalized and Preventive Medicine in the Republic of Kazakhstan." It consisted of three stages, covering the period from 2021 to 2023. In 2021, the study included 232 medical organizations, in 2022 — 76 organizations, and in 2023 — 16 organizations providing primary healthcare (PHC) services. The geographic scope of the study covered 17 regions of the Republic of Kazakhstan, including three cities of national significance (Nur-Sultan (renamed to Astana), Almaty, Shymkent), as well as regions such as Akmola, Aktobe, Almaty, Atyrau, West Kazakhstan, Zhambyl, Karaganda, Kostanay, Kyzylorda, Mangystau, Pavlodar, North Kazakhstan, Turkestan, and East Kazakhstan.

Study participants:

The study participants were selected from the staff of PHC medical organizations in the mentioned regions. The study included three groups of respondents:

Group 1: PHC Doctors

Group 2: PHC Nurses

Group 3: PHC Healthcare Managers

A total of 10,459 healthcare workers participated in the study (2,595 doctors, 5,612 nurses, and 2,252 managers). Participation in the study was voluntary, with informed consent obtained in advance.

Inclusion and exclusion criteria:

Participants of both genders, over the age of 18, representing all nationalities, were included in the study. Individuals with severe mental or somatic illnesses that could affect their perception and responses to the questionnaire were excluded from the study.

Data collection:

A shortened version of the Maslach Burnout Inventory (MBI) [13], adapted for accelerated surveying, was used to assess the level of professional burnout as in other studies [14]. The questionnaire included three key questions focusing on EE, DP and reduced PA. Participants responded to the questions on a five-point scale. The questionnaire covered the main aspects of professional burnout through three key questions: 1. EE: Question: "Do you feel emotionally exhausted because of your work?" Response options: from 1 (Very rarely) to 5 (Very often). 2. DP: Question: "Do you feel indifferent or cynical towards patients (for doctors and nurses) / colleagues and staff (for managers)?" Response options: from 1 (Very rarely) to 5 (Very often). 3. Reduced PA: Question: "Do you feel that your work is losing its meaning and significance for you?" Response options: from 1 (Very rarely) to 5 (Very often).

Results were calculated by determining the average scores for each of the three aspects of professional burnout. The average score reflects the overall level of burnout in the sample. The higher the average score (maximum of 5), the higher the level of burnout for that particular aspect among the healthcare workers.

Despite the limited number of questions, the large number of participants (2,595 doctors, 5,612 nurses, and 2,252 managers) compensated for potential statistical limitations. The large sample size ensured high reliability and validity of the data obtained.

The survey was conducted in two languages: Kazakh and Russian, using the online platform SurveyMonkey. This approach enabled broad coverage of healthcare professionals across the Republic of Kazakhstan, including all 17 regions and three cities of national significance.

General Characteristics of the Sample:

Doctors: 2,595 participants (69.0% aged 18-39 years; 45.0% male; 65.0% with higher education). Nurses: 5,612 participants (51.3% aged 18-39 years; 86.0% female; 56.4% with college education). Healthcare Managers: 2,252 participants (57.4% aged 40-60 years; 54.1% female; 62.9% with higher education).

Statistical analysis:

Statistical data analysis was performed using IBM SPSS Statistics version 22. Descriptive statistical methods included the calculation of means, standard deviations, and percentage distributions. Results were interpreted considering a significance level of $p < 0.05$. Missing data were handled using methods of multiple imputation or case exclusion.

Results.

The general characteristics of the study participants (Table 1) revealed that the majority of doctors were in the 18-39 age group, accounting for 1,558 individuals (69.0%). Similarly, among nurses, this age group predominated with 2,878 individuals (51.3%). In contrast, most healthcare managers were in the 40-60 age group, comprising 1,293 individuals (57.4%).

Gender analysis showed that among doctors, there were 1,168 men (45.0%) and 1,427 women (55.0%). Among nurses, women dominated with 4,827 individuals (86.0%), while men accounted for only 785 (14.0%). Among healthcare managers, the gender distribution also showed a majority of women — 1,218 individuals (54.1%) compared to 1,034 men (45.9%).

Regarding education level, among doctors, 1,684 individuals (65.0%) had higher education, while among nurses, 3,165 individuals (56.4%) had college education. Among healthcare managers, the majority also had higher education — 1,417 individuals (62.9%), and 493 individuals (21.9%) had postgraduate education.

Work experience distribution showed that a significant portion of doctors and managers had 11 to 20 years of experience: 843 individuals (32.5%) and 796 individuals (35.4%), respectively. Among nurses, a considerable share also had 11 to 20 years of experience — 1,964 individuals (35.0%).

Geographic distribution revealed that the largest number of nurses resided in the East Kazakhstan region — 958 individuals (17.1%). Among doctors and managers, the largest number of participants were from Almaty — 311 (12.0%) and 232 (10.3%), respectively.

The study revealed that the levels of EE, DP, and PA among PHC employees in Kazakhstan (Table 2) varied significantly depending on age, gender, education level, work experience, and region of residence.

Among age groups, younger specialists aged 18-39 showed the highest levels of EE: doctors — 3.81 ± 0.45, nurses — 3.72 ± 0.44, managers — 3.72 ± 0.44. In contrast, specialists over 60 had lower levels: doctors — 3.28 ± 0.40, nurses — 3.30 ± 0.40, managers — 3.38 ± 0.41. This may indicate a higher level of stress among younger specialists.

Gender analysis showed that men exhibited higher levels of EE (doctors — 3.75 ± 0.43, nurses — 3.74 ± 0.43, managers — 3.68 ± 0.44) compared to women (doctors — 3.54 ± 0.40, nurses — 3.61 ± 0.41, managers — 3.52 ± 0.42).

In terms of education level, the highest level of PA was observed among specialists with postgraduate education: doctors — 4.02 ± 0.50, nurses — 3.92 ± 0.47, managers — 4.00 ± 0.50, highlighting the importance of further education for professional development and satisfaction.

Work experience analysis revealed that specialists with less experience (less than 5 years) had the highest levels of EE: doctors — 3.82 ± 0.47, nurses — 3.75 ± 0.45, managers — 3.70 ± 0.46.

Regional analysis indicated that the highest levels of PA were recorded in the Turkestan region (doctors — 4.12 ± 0.50, nurses — 3.92 ± 0.47, managers — 4.05 ± 0.50), while in Almaty, these indicators were lower (doctors — 3.71 ± 0.44, nurses — 3.66 ± 0.44, managers — 3.85 ± 0.45). This suggests regional differences in professional satisfaction and work perception.

The results of the binary logistic regression analysis for factors affecting EE, DP, and PA among PHC doctors (Figure 1) showed that age, gender, education, work experience, and region of residence significantly influence EE, DP, and PA among PHC doctors. Specifically, doctors aged 40-60 had a reduced risk of EE (OR=0.75, 95% CI [0.60, 0.93], p=0.012) and DP (OR=0.86, 95% CI [0.70, 1.05], p=0.015) compared to the younger age group, while PA was higher (OR=1.14, 95% CI [0.97, 1.33], p=0.018).

Table 1. *General Characteristics of Study Participants.*

Category	Doctors	Nurses	Managers
Age Group			
18-39 years	1558 (69.0%)	2878 (51.3%)	844 (37.5%)
40-60 years	609 (27.0%)	2575 (45.9%)	1293 (57.4%)
Over 60 years	92 (4.1%)	162 (2.9%)	115 (5.1%)
Gender			
Male	1168 (45.0%)	785 (14.0%)	1034 (45.9%)
Female	1427 (55.0%)	4827 (86.0%)	1218 (54.1%)
Education Level			
College	-	2078 (37.0%)	-
Secondary Special	389 (15.0%)	3165 (56.4%)	342 (15.2%)
Higher	1684 (65.0%)	326 (5.8%)	1417 (62.9%)
Postgraduate	522 (20.0%)	43 (0.8%)	493 (21.9%)
Work Experience			
Less than 5 years	467 (18.0%)	673 (12.0%)	257 (11.4%)
5-10 years	649 (25.0%)	1403 (25.0%)	563 (25.0%)
11-20 years	843 (32.5%)	1964 (35.0%)	796 (35.4%)
Over 20 years	636 (24.5%)	1572 (28.0%)	636 (28.2%)
Region of Residence			
Nur-Sultan (Astana)	207 (8.0%)	145 (2.6%)	187 (8.3%)
Almaty	311 (12.0%)	444 (7.9%)	232 (10.3%)
Shymkent	233 (9.0%)	317 (5.6%)	198 (8.8%)
Akmola Region	168 (6.5%)	243 (4.3%)	125 (5.5%)
Karaganda Region	285 (11.0%)	430 (7.7%)	134 (5.9%)
East Kazakhstan Region	246 (9.5%)	958 (17.1%)	146 (6.5%)
Aktobe Region	140 (5.4%)	354 (6.3%)	112 (5.0%)
Almaty Region	167 (6.4%)	218 (3.9%)	109 (4.8%)
Atyrau Region	115 (4.4%)	250 (4.5%)	118 (5.2%)
West Kazakhstan Region	123 (4.7%)	233 (4.2%)	149 (6.6%)
Zhambyl Region	156 (6.0%)	421 (7.5%)	137 (6.1%)
Kostanay Region	138 (5.3%)	289 (5.1%)	102 (4.5%)
Kyzylorda Region	132 (5.1%)	130 (2.3%)	110 (4.9%)
Mangystau Region	117 (4.5%)	667 (11.9%)	106 (4.7%)
Pavlodar Region	142 (5.5%)	138 (2.5%)	97 (4.3%)
North Kazakhstan Region	110 (4.2%)	200 (3.6%)	123 (5.5%)
Turkestan Region	218 (8.4%)	175 (3.1%)	167 (7.4%)
Total	2595 (100%)	5612 (100%)	2252 (100%)

Table 2. *EE, DP, and PA Results Among PHC Employees.*

Category	Doctors			Nurses			Managers		
	EE	**DP**	**PA**	**EE**	**DP**	**PA**	**EE**	**DP**	**PA**
Age Group									
18-39 years	3.81±0.45	3.24 ± 0.50	3.62 ± 0.48	3.72 ± 0.44	3.30 ± 0.46	3.55 ± 0.45	3.72 ± 0.44	3.30 ± 0.48	3.80 ± 0.47
40-60 years	3.52 ±0.42	3.01 ± 0.46	3.84 ± 0.45	3.50 ± 0.42	3.10 ± 0.44	3.68 ± 0.44	3.55 ± 0.43	3.10 ± 0.45	3.95 ± 0.48
Over 60 years	3.28 ±0.40	2.72 ± 0.41	3.45 ± 0.44	3.30 ± 0.40	2.95 ± 0.43	3.42 ± 0.42	3.38 ± 0.41	2.95 ± 0.42	3.65 ± 0.46
Gender									
Male	3.75 ±0.43	3.11 ± 0.49	3.74 ± 0.47	3.74 ± 0.43	3.22 ± 0.45	3.70 ± 0.46	3.68 ± 0.44	3.25 ± 0.46	3.78 ± 0.48
Female	3.54 ± 0.40	2.92 ± 0.43	3.55 ± 0.44	3.61 ± 0.41	3.08 ± 0.44	3.54 ± 0.44	3.52 ± 0.42	3.05 ± 0.44	3.70 ± 0.45
Education									
College				3.51 ± 0.42	3.15 ± 0.44	3.43 ± 0.43			
Higher	3.62 ± 0.44	3.10 ± 0.46	3.83 ± 0.48	3.65 ± 0.44	3.28 ± 0.45	3.75 ± 0.45	3.60 ± 0.43	3.15 ± 0.45	3.85 ± 0.47
Postgraduate	3.75 ± 0.45	3.41 ± 0.47	4.02 ± 0.50	3.80 ± 0.46	3.40 ± 0.47	3.92 ± 0.47	3.75 ± 0.45	3.40 ± 0.48	4.00 ± 0.50
Work Experience									
Less than 5 years	3.82 ± 0.47	3.34 ± 0.48	3.54 ± 0.44	3.75 ± 0.45	3.32 ± 0.46	3.50 ± 0.44	3.70 ± 0.46	3.35 ± 0.48	3.65 ± 0.45
5-10 years	3.63 ± 0.43	3.12 ± 0.45	3.73 ± 0.46	3.62 ± 0.43	3.21 ± 0.45	3.68 ± 0.45	3.62 ± 0.44	3.20 ± 0.46	3.75 ± 0.46
11-20 years	3.42 ± 0.40	3.01 ± 0.43	3.62 ± 0.45	3.48 ± 0.41	3.10 ± 0.44	3.60 ± 0.44	3.50 ± 0.42	3.10 ± 0.44	3.80 ± 0.47
More than 20 years	3.51 ± 0.42	2.91 ± 0.41	3.82 ± 0.46	3.55 ± 0.42	3.05 ± 0.43	3.74 ± 0.45	3.55 ± 0.43	3.05 ± 0.43	3.90 ± 0.48
Region									
Nur-Sultan (Astana)	3.43 ± 0.41	2.81 ± 0.40	3.91 ± 0.46	3.47 ± 0.41	3.00 ± 0.42	3.78 ± 0.45	3.50 ± 0.42	3.00 ± 0.44	3.90 ± 0.47
Almaty	3.34 ± 0.40	2.72 ± 0.39	3.71 ± 0.44	3.40 ± 0.40	2.90 ± 0.41	3.66 ± 0.44	3.45 ± 0.41	2.95 ± 0.43	3.85 ± 0.45
Shymkent	3.71 ± 0.46	3.41 ± 0.48	4.03 ± 0.49	3.68 ± 0.45	3.35 ± 0.47	3.90 ± 0.48	3.68 ± 0.45	3.35 ± 0.47	4.05 ± 0.49
Akmola Region	3.54 ± 0.44	3.03 ± 0.43	3.53 ± 0.42	3.52 ± 0.42	3.10 ± 0.44	3.55 ± 0.43	3.55 ± 0.43	3.10 ± 0.45	3.70 ± 0.46
Karaganda Region	3.62 ± 0.45	3.11 ± 0.45	3.82 ± 0.47	3.64 ± 0.44	3.20 ± 0.45	3.72 ± 0.45	3.60 ± 0.44	3.15 ± 0.46	3.85 ± 0.47
East Kazakhstan Region	3.43 ± 0.40	2.92 ± 0.41	3.53 ± 0.44	3.49 ± 0.41	3.00 ± 0.42	3.58 ± 0.44	3.50 ± 0.42	3.05 ± 0.43	3.75 ± 0.45
Aktobe Region	3.52 ± 0.42	3.21 ± 0.44	3.44 ± 0.42	3.54 ± 0.42	3.25 ± 0.45	3.50 ± 0.43	3.52 ± 0.43	3.20 ± 0.45	3.68 ± 0.44
Almaty Region	3.22 ± 0.38	2.71 ± 0.39	3.64 ± 0.43	3.36 ± 0.40	2.95 ± 0.41	3.65 ± 0.44	3.40 ± 0.40	2.95 ± 0.42	3.80 ± 0.46
Atyrau Region	3.13 ± 0.37	3.02 ± 0.43	3.73 ± 0.44	3.32 ± 0.39	3.08 ± 0.44	3.67 ± 0.44	3.35 ± 0.40	3.00 ± 0.44	3.85 ± 0.46
West Kazakhstan Region	3.42 ± 0.40	2.93 ± 0.42	3.74 ± 0.46	3.50 ± 0.42	3.05 ± 0.43	3.71 ± 0.45	3.48 ± 0.42	3.05 ± 0.43	3.85 ± 0.47
Zhambyl Region	3.53 ± 0.44	3.11 ± 0.45	3.52 ± 0.41	3.56 ± 0.43	3.15 ± 0.44	3.55 ± 0.43	3.55 ± 0.43	3.15 ± 0.46	3.70 ± 0.45
Kostanay Region	3.33 ± 0.41	2.82 ± 0.40	3.83 ± 0.47	3.45 ± 0.41	3.00 ± 0.42	3.75 ± 0.45	3.42 ± 0.41	2.98 ± 0.42	3.85 ± 0.46
Kyzylorda Region	3.71 ± 0.45	3.01 ± 0.44	3.92 ± 0.48	3.69 ± 0.45	3.10 ± 0.44	3.82 ± 0.46	3.65 ± 0.45	3.05 ± 0.44	3.95 ± 0.48
Mangystau Region	3.21 ± 0.39	3.11 ± 0.45	3.44 ± 0.42	3.35 ± 0.41	3.18 ± 0.45	3.45 ± 0.42	3.38 ± 0.41	3.10 ± 0.45	3.68 ± 0.44
Pavlodar Region	3.63 ± 0.45	3.32 ± 0.48	4.12 ± 0.49	3.63 ± 0.44	3.35 ± 0.47	3.93 ± 0.48	3.60 ± 0.44	3.25 ± 0.47	4.05 ± 0.49
North Kazakhstan Region	3.44 ± 0.42	3.11 ± 0.44	4.02 ± 0.48	3.49 ± 0.42	3.18 ± 0.45	3.90 ± 0.47	3.52 ± 0.43	3.15 ± 0.46	4.00 ± 0.48
Turkestan Region	3.53 ± 0.43	3.21 ± 0.46	4.12 ± 0.50	3.55 ± 0.43	3.22 ± 0.45	3.92 ± 0.47	3.58 ± 0.44	3.25 ± 0.47	4.05 ± 0.50

Doctors over 60 also had a lower risk of EE (OR=0.68, 95% CI [0.52, 0.88], p=0.024) and DP (OR=0.74, 95% CI [0.58, 0.94], p=0.029), but experienced reduced PA (OR=0.89, 95% CI [0.72, 1.11], p=0.031).

Female doctors showed a lower risk of EE (OR=0.82, 95% CI [0.67, 0.99], p=0.015) and DP (OR=0.77, 95% CI [0.63, 0.94], p=0.023) compared to male doctors, but also had lower levels of PA (OR=0.82, 95% CI [0.68, 0.99], p=0.022). Higher and postgraduate education increased the risk of EE and DP, but simultaneously increased PA (for postgraduate education: OR=1.35, 95% CI [1.12, 1.61], p=0.014).

Work experience also had a significant impact: doctors with 11-20 years and more than 20 years of experience had a reduced risk of EE and DP, but reported higher PA (OR=1.11, 95% CI [0.92, 1.34], p=0.024 for more than 20 years of experience).

Region of residence also showed a significant effect. Doctors from Almaty and Shymkent demonstrated higher levels of EE and DP, while regions like Pavlodar and Turkestan reported higher levels of PA (OR=1.35, 95% CI [1.12, 1.64], p=0.011 and OR=1.4, 95% CI [1.15, 1.71], p=0.01, respectively).

The study results also show that age, gender, education, work experience, and region of residence significantly influence EE, DP, and PA among PHC nurses (Figure 2).

Nurses aged 40-60 had a lower risk of EE (OR=0.84, 95% CI [0.69, 1.03], p=0.017) and DP (OR=0.86, 95% CI [0.71, 1.04], p=0.019) compared to the younger age group, but demonstrated higher PA (OR=1.11, 95% CI [0.92, 1.33], p=0.022). Nurses over 60 also showed a reduced risk of EE (OR=0.73, 95% CI [0.57, 0.93], p=0.023) and DP (OR=0.78, 95% CI [0.63, 0.98], p=0.028), but had lower PA (OR=0.86, 95% CI [0.70, 1.07], p=0.034).

Female nurses demonstrated a lower risk of EE (OR=0.8, 95% CI [0.66, 0.98], p=0.02) and DP (OR=0.79, 95% CI [0.65, 0.97], p=0.024), as well as lower PA (OR=0.82, 95% CI [0.68, 0.99],

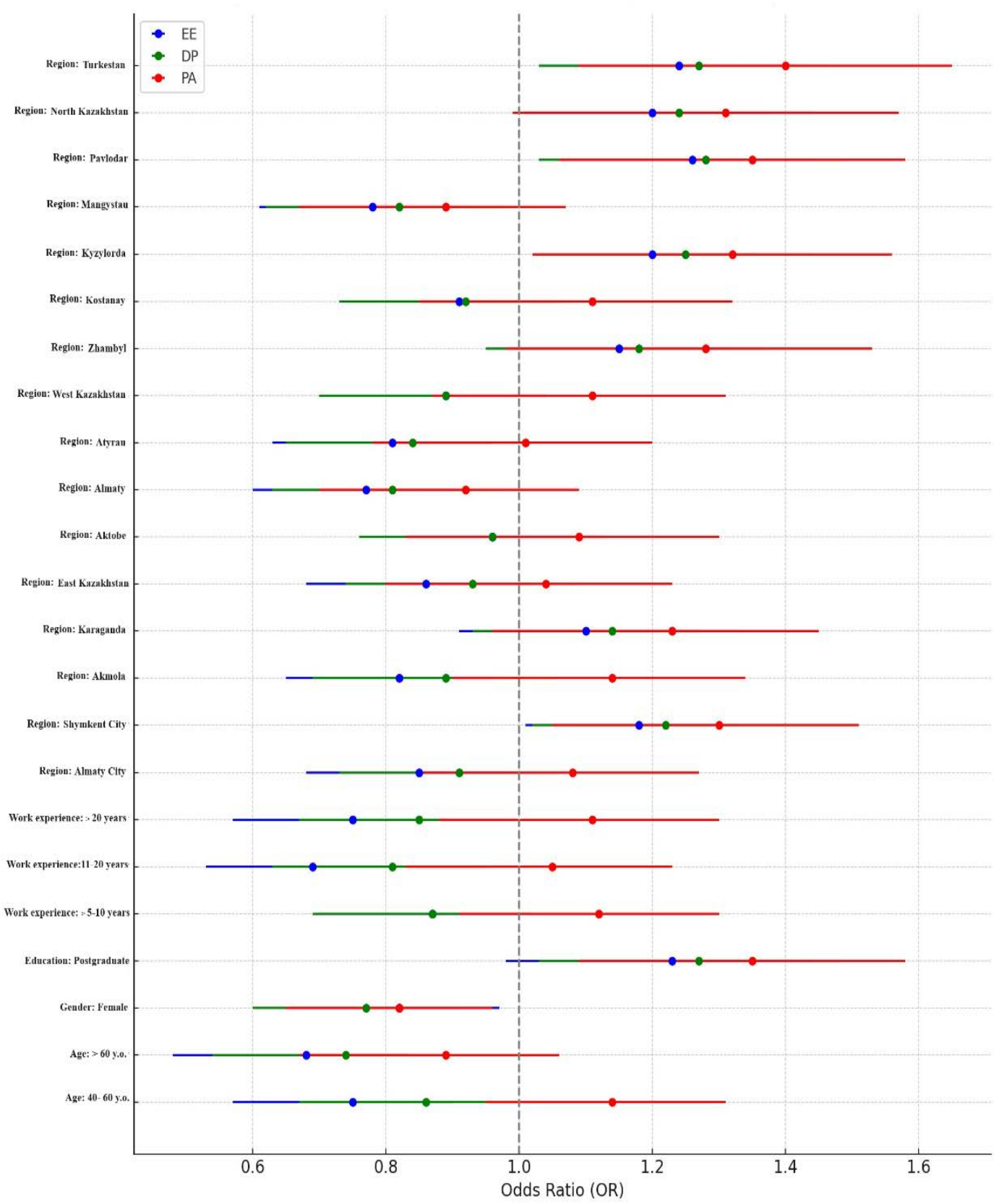

Figure 1. *Binary Logistic Regression of Factors Influencing EE, DP, and PA among PHC doctors.*

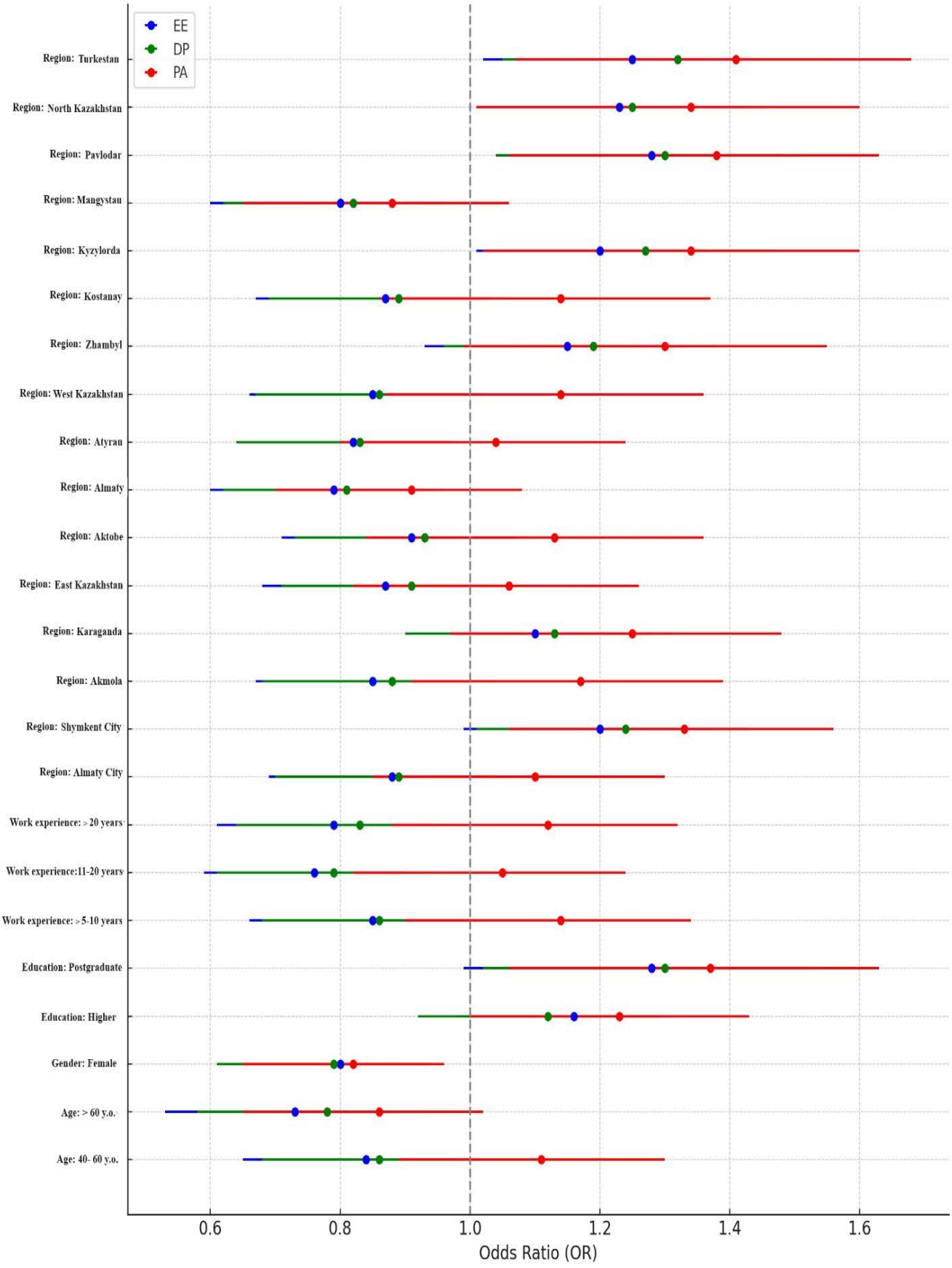

Figure 2. *Binary Logistic Regression of Factors Influencing EE, DP, and PA among PHC nurses.*

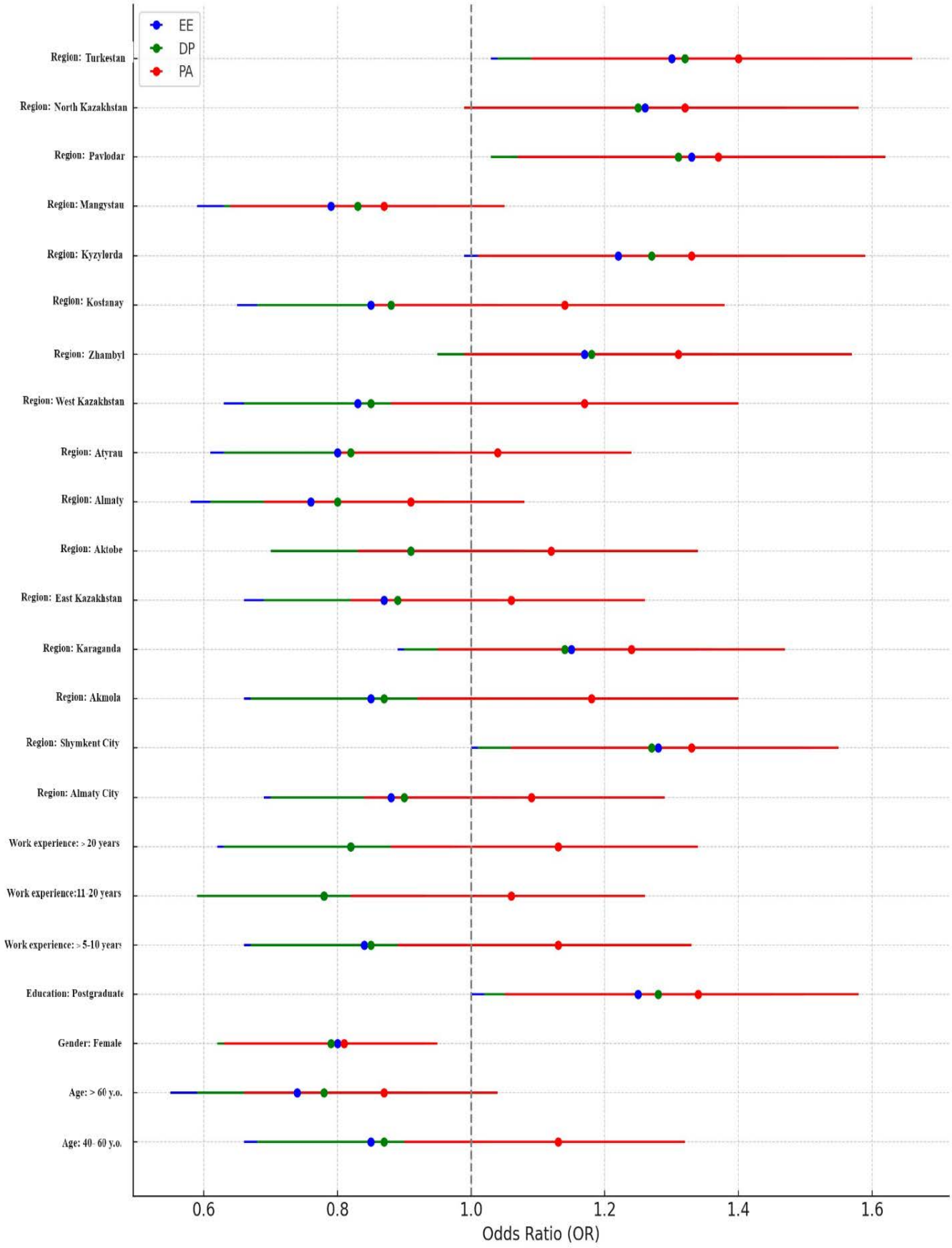

Figure 3. *Binary Logistic Regression of Factors Influencing EE, DP, and PA among PHC managers.*

p=0.027) compared to male nurses. Higher and postgraduate education increased the risk of EE and DP, but also contributed to higher PA, especially for nurses with postgraduate education (OR=1.37, 95% CI [1.11, 1.68], p=0.014).

The study results also show (Figure 3) that managers aged 40-60 have a reduced risk of EE with an Odds Ratio (OR) of 0.85 (95% CI [0.70, 1.04], p=0.019) and DP with an OR of 0.87 (95% CI [0.71, 1.06], p=0.020) compared to the 18-39 age group. At the same time, their risk of lower PA is higher with an OR of 1.13 (95% CI [0.94, 1.36], p=0.024). Managers over 60 had an even lower risk of EE with an OR of 0.74 (95% CI [0.58, 0.93], p=0.026), DP with an OR of 0.78 (95% CI [0.63, 0.97], p=0.028), and a reduced risk of lower PA with an OR of 0.87 (95% CI [0.70, 1.08], p=0.032).

Female managers demonstrated a lower risk of EE with an OR of 0.80 (95% CI [0.66, 0.97], p=0.022), DP with an OR of 0.79 (95% CI [0.65, 0.96], p=0.025), and lower PA with an OR of 0.81 (95% CI [0.67, 0.99], p=0.027) compared to male managers.

Managers with postgraduate education had a higher risk of EE with an OR of 1.25 (95% CI [1.05, 1.50], p=0.015), DP with an OR of 1.28 (95% CI [1.06, 1.54], p=0.013), and lower PA with an OR of 1.34 (95% CI [1.10, 1.63], p=0.015) compared to managers with only higher education.

Work experience also impacted risks. Managers with 5-10 years of experience had a reduced risk of EE with an OR of 0.84 (95% CI [0.69, 1.02], p=0.021) and DP with an OR of 0.85 (95% CI [0.70, 1.03], p=0.027), but their risk of lower PA was higher with an OR of 1.13 (95% CI [0.93, 1.37], p=0.023). Managers with 11-20 years of experience showed similar results with an OR of 0.78 (95% CI [0.63, 0.97], p=0.027) for EE and an OR of 0.78 (95% CI [0.63, 0.97], p=0.031) for DP, with an increased risk of lower PA with an OR of 1.06 (95% CI [0.86, 1.30], p=0.029). For managers with more than 20 years of experience, the risk of EE was OR 0.82 (95% CI [0.66, 1.02], p=0.031), DP OR 0.82 (95% CI [0.67, 1.01], p=0.035), while the risk of lower PA was higher with an OR of 1.13 (95% CI [0.92, 1.38], p=0.025).

Region of residence also had a significant impact. Managers from Shymkent showed an increased risk of EE with an OR of 1.28 (95% CI [1.05, 1.56], p=0.014), DP with an OR of 1.27 (95% CI [1.05, 1.53], p=0.016), and lower PA with an OR of 1.33 (95% CI [1.11, 1.60], p=0.016). Similarly, managers from Pavlodar had an increased risk of EE with an OR of 1.33 (95% CI [1.11, 1.60], p=0.010), DP with an OR of 1.31 (95% CI [1.08, 1.59], p=0.011), and lower PA with an OR of 1.37 (95% CI [1.12, 1.67], p=0.011). Managers from other regions, such as Almaty and Akmola, demonstrated lower risks for these indicators.

Discussion.

As is well known, the characteristics and stress factors in the workplace for healthcare workers are identified as burnout-related factors, such as age, gender, profession, workload, work environment, weekly working hours, the number of patients treated, interpersonal conflicts, and social support [15]. The results of this study show that professional burnout is a significant issue among PHC workers in Kazakhstan, with levels of EE, DP, and PA varying significantly depending on age, gender, education level, work experience, and region of residence.

Burnout is prevalent across all positions in the clinic, suggesting that it may be a characteristic feature of certain practices or PHC in general [8]. There are varying results regarding burnout levels among doctors and nurses, as some studies associate higher burnout levels with doctors, others with nurses, while some find no significant difference between the two groups [16-18].

According to our findings, it was established that young professionals aged 18-39 exhibit the highest levels of EE compared to their older colleagues. This may be due to a lack of experience needed to effectively manage stress and workplace demands [19], highlighting the need for additional support measures for young professionals. In contrast, specialists over 60 showed lower levels of EE and DP, which may indicate accumulated experience and the development of more resilient coping strategies over the course of their careers [20]. Additionally, young professionals at the start of their careers may have more family responsibilities, which can intensify the conflict between work and personal life. Combined with lower professional self-efficacy, this may lead to a higher risk of burnout compared to the older age group [21]. One possible reason could be the uncertainty of career prospects and the lack of job security for younger employees. Additionally, older employees tend to learn how to manage work-related stress, adapt, and become more resilient to burnout over time [22].

Gender differences also proved to be significant. Men generally experience higher levels of EE and DP compared to women, which may be linked to differences in socio-economic roles, responsibilities, and cultural expectations. Additionally, women showed lower levels of PA, which may indicate existing barriers to career advancement and professional development for women in healthcare. Available studies present mixed results regarding the relationship between burnout risk and gender. Some research highlights high burnout risks among women [23], while others point to higher risks among men [24]. Burnout may require different approaches at the individual level and different organizational support mechanisms for female and male medical workers [25].

Education emerged as an important factor influencing burnout levels. Specialists with higher and postgraduate education demonstrated higher levels of EE and DP, but at the same time, they also had higher levels of PA. This could reflect the ambitions and high expectations these groups have for their work, which on one hand, fosters professional development, but on the other, increases the risk of burnout [26].

Work experience also impacted burnout indicators. Workers with 11 to 20 years of experience showed lower levels of EE and DP, but higher PA, emphasizing the importance of experience and professional maturity in reducing burnout risk [27]. At the same time, specialists with less experience (less than 5 years) were the most vulnerable to burnout, which aligns with other studies [28,29] and highlights the need to develop adaptation and support strategies for this group.

Regional differences in burnout levels were also significant [27]. For example, PHC workers in regions such as Shymkent and Pavlodar showed higher levels of EE and DP, possibly due

to differences in working conditions, access to resources, and levels of social support in these regions. Meanwhile, higher levels of PA were observed in Turkestan, which may indicate better job perception and satisfaction among PHC workers in that region. According to available literature, in regions with better access to medical resources but higher workloads on healthcare workers, such as large cities, burnout levels tend to be higher compared to rural areas [30]. Considering that Shymkent is one of large city of national significance, the high levels of EE and DP observed may support this fact and warrant further investigation. Additionally, healthcare personnel in urban medical institutions, compared to those in rural regions, tend to place higher demands on themselves at work and have less control over their tasks, which can lead to burnout-induced exhaustion. In contrast, rural physicians often experience lower levels of social support, further contributing to the challenges they face [31]. Regional differences in the prevalence of burnout within a country can be attributed to the availability of resources, work intensity, and working conditions, highlighting the need to adapt preventive and supportive measures to the specific characteristics of each region [32].

Thus, the study results highlight the need to consider socio-demographic factors when developing and implementing burnout prevention and intervention programs for PHC workers [33]. Special attention should be given to supporting young professionals, with attention to gender, and workers in regions with higher burnout risks. It is also important to develop professional development programs that will enhance personal accomplishment while reducing levels of emotional exhaustion and depersonalization [34].

Conclusion.

The study revealed that professional burnout is a widespread issue among PHC workers in Kazakhstan. Age, gender, education, work experience, and region of residence were found to be significant factors influencing levels of EE, DP, and PA. Young professionals, men, as well as those with higher and postgraduate education, exhibited higher levels of burnout. At the same time, regional differences suggest that working conditions and access to resources can significantly affect professional burnout. These findings highlight the need to develop targeted support programs aimed at reducing burnout risk among the most vulnerable groups of PHC workers.

Conflict of Interest.

The authors declare no conflict of interest that could have influenced the results of this study.

Study Limitations.

This study has several limitations. First, the sample is limited to PHC workers, which may restrict the generalizability of the results to other categories of healthcare professionals. Second, the study relies on self-reports from participants, which may introduce elements of subjectivity in assessing the level of professional burnout. Finally, the limited number of questions in the questionnaire may not cover all aspects of professional burnout, highlighting the need for further research using more comprehensive assessment tools. Shortened version MBI may reduce the validity of the three scales and may not fully take into account all the factors of emotional burnout. This limitation is encountered in many studies due to the fact that different versions of the MBI scales are used in various studies, as well as different threshold systems, and the comparison and interpretation of results from different studies should be approached with caution.

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