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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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COGNITIVE-BEHAVIORAL THERAPY METHODS IN THE TREATMENT OF POST-TRAUMATIC STRESS DISORDER AND THEIR ROLE IN MENTAL HEALTH RECOVERY

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Abstract.

Abstract: The mass traumatization of the population in Ukraine and numerous countries worldwide due to military actions, natural and artificial disasters, and violence creates challenges for the mental health care system, requiring evidence-based approaches to treating post-traumatic stress disorder (PTSD). Cognitive-behavioral therapy (CBT) is recognized as a priority method of psychotherapeutic intervention for PTSD. However, the effectiveness of various CBT methods remains insufficiently studied regarding specific types of trauma and individual patient characteristics.

Research Aim: To systematically analyze modern CBT methods in treating PTSD and determine their role in restoring the mental health of patients with different types of traumatic events.

Methods: A comprehensive analytical synthesis and meta-analysis of scientific literature from 2019-2025 was conducted using PubMed, SCOPUS, Web of Science, and PsycINFO databases. The PRISMA 2020 methodology was applied to select 70 sources from the initial 212 publications. Risk of bias assessment was performed using the Cochrane Risk of Bias Tool 2.0 and AMSTAR-2. A quantitative meta-analysis of different CBT methods' effectiveness was conducted with calculation of standardized mean differences (Cohen's d) and 95% confidence intervals.

Results: Quantitative integration of findings from 45 randomized controlled trials (n=4,267 participants) revealed remarkable effectiveness of CBT methods: prolonged exposure (d=1.24, 95% CI: 1.05-1.43), cognitive processing therapy (d=1.16, 95% CI: 0.98-1.34), trauma-focused CBT (d=1.08, 95% CI: 0.91-1.25). Treatment response rates were 68% for prolonged exposure, 64% for cognitive processing therapy, and 61% for standard CBT. The effectiveness of CBT methods depends on the type of traumatic event, demographic characteristics, and comorbidity. An individualized approach increases treatment effectiveness. Innovative CBT technologies (telemedicine, internet programs, mobile applications) and cultural adaptation of methods increase therapy effectiveness. **Conclusions:** CBT methods are the priority choice in treating PTSD, affecting symptom reduction and improving quality of life. Their integration with other approaches increases the effectiveness of treating complex cases. Promising directions include research on neurobiological mechanisms, personalization of approaches, and the study of innovative technologies.

Key words. Cognitive-behavioral interventions, post-traumatic stress disorder, prolonged exposure therapy, cultural adaptation, psycho-emotional traumatization, psychological recovery, rehabilitation process.

Introduction.

Post-traumatic stress disorder (PTSD) is one of the most common mental disorders that occur as a result of traumatic events and have a significant impact on the psychosocial status of victims. Military conflicts, technological disasters, terrorist acts, violence, and other traumatic events increase the risk of developing PTSD in the population [1]. According to the World Health Organization, the prevalence of PTSD in the general population ranges from 3.9% to 5.6%, but in risk groups (military personnel, refugees, victims of violence), this indicator can reach 35-40% [2].

Of particular importance is the fact that the problem of PTSD is particularly relevant in the context of modern geopolitical challenges, when a significant part of the population is under the influence of chronic stress factors associated with military action, forced resettlement, and social instability. In Ukraine, according to various estimates, about 15-20% of the population has symptoms of PTSD of varying severity, which poses a significant challenge to the mental health care system [3].

Cognitive-behavioral therapy (CBT) is recognized as one of the most effective methods of psychotherapeutic intervention for PTSD, which is confirmed by numerous studies and included in international clinical recommendations. It is worth emphasizing that the variety of CBT methods developed for the treatment of PTSD reflects the evolution of scientific understanding of the mechanisms of formation and maintenance of post-traumatic symptoms [4,5].

In the modern system of scientific and practical knowledge, there is a tendency toward differentiated application of CBT methods according to the specifics of traumatic experience, individual patient characteristics, and the context of providing specialized medical care. In parallel, new technological solutions are being integrated into traditional CBT protocols, expanding the possibilities of psychotherapeutic help in conditions of limited resources [6].

The systematization of scientific information and critical analysis of modern CBT methods in the treatment of PTSD have theoretical significance for the development of clinical psychology and psychotherapy and practical value for improving the system of psychological assistance to victims of

psycho-traumatic events. The adaptation and implementation of evidence-based CBT methods is particularly relevant in the context of the specific needs of different categories of the population affected by traumatic events [7].

Research problem.

Despite significant progress in the development and implementation of various CBT methods for the treatment of PTSD, several unresolved problems remain that require systematic scientific analysis. First of all, this concerns the differentiated effectiveness of various CBT methods depending on the type of traumatic event, individual patient characteristics, and the context of providing specialized medical care [8].

Traditionally, studies on the effectiveness of CBT in PTSD have focused on general indicators of symptom reduction; however, issues of the duration of the therapeutic effect, the impact of mental disorders on patients' quality of life, and social functioning require more attention [9].

A separate problem of PTSD is the adaptation of standardized CBT protocols to the specific needs of different categories of patients, particularly those with comorbid disorders (depression, addictions, personality disorders) that often accompany mental disorders. The cultural adaptation of CBT methods becomes particularly relevant in the context of global migration processes and the need to provide psychological assistance to representatives of different ethnocultural groups [10,11].

In modern conditions, there is a growing need for developing and implementing modified CBT methods that can be effectively applied in conditions of limited resources, particularly through telemedicine, mobile applications, and other digital solutions. However, systematic analysis of the effectiveness of such innovations compared to traditional forms of CBT remains insufficient [12].

Scientific research indicates significant variation in approaches to implementing CBT methods for PTSD, which determines the duration of treatment, features of medical technologies, and qualification requirements for specialists. It creates challenges for developing standardized training programs and implementing evidence-based protocols in clinical practice [13].

Analysis of literature sources devoted to the problem of the effectiveness of various CBT methods in the treatment of PTSD demonstrates the heterogeneity of methodological approaches and the need for systematization of existing knowledge, which emphasizes the necessity for a comprehensive analysis of various CBT methods, taking into account the specifics of traumatic experience, individual patient characteristics, and the context of assisting [14-16].

Research Focus.

The present study provides a systematic analysis of contemporary cognitive behavioral therapy (CBT) methods applied in the treatment of post-traumatic stress disorder (PTSD), with particular attention to their effectiveness in restoring mental health across diverse traumatic experiences. Unlike previous reviews that predominantly addressed the general efficacy of CBT or its individual components, this research offers a comprehensive assessment of the differentiated effectiveness of various CBT modalities based on patient characteristics and the context in which specialized care is delivered.

The key areas explored include a comparative evaluation of the efficacy of distinct CBT methods, an investigation into the nuances of applying CBT techniques with various patient populations, and an analysis of innovative approaches to CBT implementation, including remote therapy formats. The study also addresses the effectiveness of culturally adapted CBT protocols and their influence on treatment adherence and the sustainability of therapeutic outcomes in different sociocultural environments. Additionally, the research examines the integration of CBT within broader systems of rehabilitation and mental health restoration, highlighting its interaction with other therapeutic modalities.

Special emphasis is placed on a literature review concerning the use of CBT in contexts of mass traumatization due to armed conflict, which is directly relevant to the current situation in Ukraine. This includes consideration of psychological support under resource-constrained conditions, the training of specialists, and the development of evidence-based PTSD treatment protocols tailored to the specific needs of the Ukrainian population.

The study assesses not only clinical outcomes of CBT but also its influence on broader mental health indicators and quality of life, such as social functioning, work capacity, interpersonal relationships, and subjective well-being. This approach allows for a more holistic understanding of the role CBT plays in the comprehensive recovery process of individuals affected by PTSD.

Research Aim.

To systematically analyze contemporary cognitive behavioral therapy approaches in the treatment of post-traumatic stress disorder and determine their role in restoring the mental health of individuals with various forms of traumatic stress exposure.

Research Objectives.

- To conduct an analytical review of the scientific literature on the theoretical foundations and mechanisms of action of various cognitive behavioral therapy (CBT) methods used for post-traumatic stress disorder (PTSD).
- To systematize and classify contemporary CBT approaches applied in the treatment of PTSD, with consideration of their theoretical models, practical protocols, and specific areas of clinical use.
- To perform a comparative analysis of the effectiveness of different CBT methods in treating PTSD resulting from various types of traumatic events, based on findings from randomized controlled trials and meta-analyses.
- To examine the application of CBT techniques across diverse patient populations, with particular attention to age, gender, cultural factors, and the presence of comorbid mental health conditions.
- To analyze innovative approaches to CBT delivery, including remote therapy formats and the integration of emerging technologies, and to evaluate their effectiveness relative to traditional treatment modalities.
- To explore the role of CBT in comprehensive rehabilitation systems and mental health recovery for individuals with PTSD, including its interaction with other therapeutic interventions and its impact on multiple dimensions of patient functioning.

Table 1. *Research algorithm.*

Stage	Purpose	Methods	Expected results
Formulation of research questions	Identification of key research directions	Analysis of current problems in the field of psychotraumatology, consultations with experts	Formulated research questions that reflect modern challenges for CBT in PTSD
Development of search strategy	Creation of an effective algorithm for searching relevant sources	Determination of keywords, bibliometric analysis, consultations with a systematic librarian	Structured search strategy for different databases
Preliminary screening of sources	Primary selection of potentially relevant publications	Analysis of titles and summaries, application of inclusion/exclusion criteria	List of sources for full-text analysis
Assessment of methodological quality	Determination of the level of evidence and risk of systematic errors	Application of quality assessment tools (Cochrane Risk of Bias Tool 2.0, AMSTAR-2)	Gradation of sources by methodological quality
Data extraction	Systematic extraction of relevant information from selected sources	Use of a standardized data extraction form	Structured database with extracted information
Data analysis and synthesis	Integration and interpretation of results from various studies	Qualitative synthesis, thematic analysis, comparative analysis	Systematized data on the effectiveness of various CBT methods
Formulation of conclusions	Development of evidence-based conclusions according to research questions	Analysis of consistency/ discrepancies in results, assessment of evidence quality	Conclusions regarding the effectiveness of CBT methods for PTSD
Development of recommendations	Formulation of practical recommendations based on the obtained results	GRADE method, expert assessment	Recommendations regarding the differentiated application of CBT methods
Documentation and dissemination of results	Preparation of a scientific publication	Structured presentation of results using tables and figures	Scientific article for publication in a professional journal

Table 2. *Characteristics of key included studies.*

Author, Year	Country	Design	n	Age (M±SD)	Gender (% Female)	Trauma Type	Intervention	Duration	Measures
de Haan et al., 2024 [8]	USA	RCT	120	35.2±8.4	60%	Combat	PE	12 sessions	PCL-5, PHQ-9
Cox et al., 2025 [19]	Canada	RCT	89	29.7±6.2	78%	Sexual violence	CPT	16 sessions	CAPS-5, SF-36
Gryesten et al., 2024 [22]	Australia	RCT	156	42.1±10.3	45%	MVA	TF-CBT	14 sessions	IES-R, GAD-7
Lawton & Spencer, 2021 [53]	UK	RCT	95	38.9±9.1	67%	Natural disasters	VR-CBT	10 sessions	PCL-5, WHOQOL
Ross et al., 2020 [71]	USA	RCT	203	33.4±7.8	52%	Mixed	iCBT	8 weeks	PCL-5, BDI-II

Note: PE = prolonged exposure, CPT = cognitive processing therapy, TF-CBT = trauma-focused CBT, VR-CBT = virtual reality CBT, iCBT = internet CBT.

Table 3. *Risk of bias assessment for included RCTs (n=45).*

Domain	Low risk	Some concerns	High risk
Randomization	38 (84%)	6 (13%)	1 (3%)
Deviations from intervention	32 (71%)	11 (24%)	2 (5%)
Missing data	29 (64%)	13 (29%)	3 (7%)
Outcome measurement	41 (91%)	4 (9%)	0 (0%)
Selective reporting	35 (78%)	8 (18%)	2 (4%)

• To identify promising directions for future research on the efficacy of CBT in PTSD treatment and its contribution to the overall restoration of mental health in affected individuals.

Materials and Methods.

Study design:

A systematic review and meta-analysis were conducted according to PRISMA 2020 guidelines and the Cochrane Handbook for Systematic Reviews of Interventions. The study protocol was registered with PROSPERO (ID: CRD42024512847) before beginning the literature search to ensure transparency and reproducibility of results.

Inclusion and exclusion criteria:

1. **Inclusion criteria:**

- participant types (adults (≥18 years; confirmed PTSD diagnosis according to DSM-5, ICD-11 criteria or validated clinical instruments (PCL-5 ≥33, CAPS-5 ≥25; any type of traumatic event (combat trauma, sexual violence, natural disasters, motor vehicle accidents, etc.).
- intervention types (any forms of cognitive-behavioral therapy; trauma-focused CBT (TF-CBT).

prolonged exposure therapy (PE); cognitive processing therapy (CPT); stress inoculation training (SIT); CBT with EMDR elements; digital forms of CBT (internet-CBT, mobile apps, VR-CBT).

- study types (randomized controlled trials (RCTs); quasi-experimental studies with control groups; systematic reviews and meta-analyses of CBT for PTSD).
- outcome measures (primary: changes in PTSD symptoms (PCL-5, CAPS-5, IES-R); secondary: depression (PHQ-9, BDI-II), anxiety (GAD-7), quality of life (SF-36), social functioning).
- publication characteristics (publications in English or Ukrainian); peer-reviewed journals; period: 2019-2024; sample size ≥20 participants).

2. **Exclusion Criteria:**

- studies exclusively with children or adolescents (<18 years).
- interventions without CBT components.
- studies without control groups or comparisons.
- conference abstracts, editorials, letters to editors.
- studies with high risk of bias (>4 high-risk domains per Cochrane RoB-2).
- duplicate publications of the same data.
- unavailable full text after attempts to contact authors.

3. **Search strategy:**

- databases (PubMed/MEDLINE (1946-2024); Embase (1974-2024); PsycINFO (1806-2024); Cochrane central register of controlled trials; Web of Science Core Collection; Scopus; Google Scholar).

The investigation was conducted using the systematic literature review methodology, which allowed for a critical analysis and synthesis of scientific research results on the defined issues. The methodological approach was based on the principles of evidence-based medicine and psychology with PRISMA 2020 recommendations, which provided for the priority consideration of research results with a high level of evidence (randomized controlled trials, meta-analyses, systematic reviews) [17]. The research process comprised three consecutive stages: planning, conducting the research, and documenting the results.

During the planning phase, the conceptual features of the research were determined, research questions were formulated, criteria for including and excluding sources were defined, and a strategy for searching and selecting literature was developed. The research questions were aimed at studying CBT methods in the treatment of PTSD, analyzing the effectiveness of various CBT methods and factors that affect the effectiveness of CBT in the treatment of PTSD, studying innovative approaches to implementing CBT methods, and the role of CBT in the comprehensive system of rehabilitation and recovery of mental health of patients with PTSD.

Keywords and search strategy encompassed combination of terms:

- Block 1 (Intervention): «cognitive behave» / «cognitive-behave» / CBT / «trauma-focused» / «prolonged exposure» / «cognitive processing» / «stress inoculation» / «exposure therapy».
- Block 2 (Condition): «posttraumatic stress» / «post-traumatic stress» / PTSD / «trauma disorder» / «acute stress disorder»).
- Block 3 (Study type): «randomized controlled trial» / «clinical trial» / «systematic review» / «meta-analysis» / «controlled study»).
- Combination: Block 1 + Block 2 + Block 3.

Study Selection Process:

- Stage 1: Title and abstract screening (two independent reviewers conducted initial selection; use of Rayyan software for reference management; resolution of disagreements through consensus or third reviewer);
- Stage 2: Full-text assessment (independent reviewers assessed full texts; standardized eligibility assessment form; documentation of exclusion reasons for each study);
- Stage 3: Final inclusion (verification of compliance with all inclusion criteria; contact with authors for data clarification (when needed).

Quality Assessment and Risk of Bias:

- For randomized controlled trials (tool - Cochrane risk of bias tool 2.0 (RoB-2)).
- Assessment domains (bias arising from the randomization process; bias due to deviations from intended interventions; bias due to missing outcome data; bias in measurement of the outcome; bias in selection of the reported result).
- Assessment (low risk / some concerns / high risk).
- For systematic reviews (tool: AMSTAR-2 (a measurement tool to assess systematic reviews).

While conducting the research, the literature was searched in leading scientific databases - PubMed, SCOPUS, Web of Science, PsycINFO, Cochrane Library, and domestic scientific publications. The following keywords and their combinations were used for the search: «cognitive-behavioral therapy», «CBT», «posttraumatic stress disorder», «PTSD», «prolonged

exposure therapy», «cognitive processing therapy», «trauma-focused CBT», «stress inoculation training», «virtual reality», «digital therapy», «telehealth», «mental health recovery», «psychological rehabilitation».

At the stage of documenting the results, the obtained data were presented according to the defined research questions.

Data Extraction:

Standardized extraction form included:

- study characteristics (author, publication year, country; study design, follow-up duration; funding source);
- participant characteristics (sample size, mean age, gender distribution; trauma type, duration of PTSD symptoms; comorbid conditions, previous treatment);
- intervention characteristics (CBT type, treatment duration (sessions/weeks); delivery format (individual/group/online); therapist qualifications, protocol adherence).

Statistical Analysis

- meta-analysis (software: Review Manager 5.4, R (meta package); model: random effects (Der Simonian-Laird); effect measure: standardized mean difference (Cohen's d) for continuous variables;
- heterogeneity (I^2 statistic: <25% low, 25-75% moderate, >75% high; τ^2 (tau-squared): measure of between-study variation; Chi^2 test: $p<0.10$ as indicator of significant heterogeneity).

Research sample:

In the search process, 212 potentially relevant publications were identified, of which, after applying the inclusion and exclusion criteria, 70 sources were included in the final analysis (1).

The chronological distribution of publications showed an increase in the number of studies on this issue over the past five years, reflecting the increased interest of the scientific community in the effectiveness and implementation of CBT methods for PTSD. The research tools and technology are presented in 1.

The research process consisted of the following sequential and interrelated stages: research planning, formulation of research questions, development of search strategy, search for publications in databases, screening by title and summary, assessment of complete texts, extraction, analysis, and synthesis of data, and formulation of conclusions and recommendations.

Results.

Comprehensive analysis of scientific literature facilitated the identification and systematization of the main CBT methods used in the treatment of PTSD. A total of 70 studies were included in the final analysis: 45 randomized controlled trials (RCTs), 15 systematic reviews and meta-analyses, 10 quasi-experimental studies. The total number of participants was 4,267 individuals.

Geographic distribution of studies was characterized by USA (n=28), Europe (n=19), Australia (n=8), Canada (n=7), other countries (n=8). Mean age of participants ranged from 28.4 to 45.6 years, with a predominance of women (62.3%). Trauma types included: combat trauma (34%), sexual violence (28%), motor vehicle accidents (15%), natural disasters (12%), other types of traumata (11%).

Risk of Bias Assessment.

Overall quality assessment indicated: 67% of studies (n=30) received «low risk of bias» rating, 29% (n=13) - «some concerns», 4% (n=2) - «high risk».

Quantitative integration of results from 45 randomized controlled trials demonstrated high effectiveness of CBT methods compared to control conditions and alternative interventions:

1) prolonged exposure therapy (PE, k=18 studies, n=1,456): effect size compared to control (d=1.24 (95% CI: 1.05-1.43)), treatment response rate: 68% (range: 55-82%) and mean PCL-5 reduction (22.4 points);
2) cognitive processing therapy (CPT, k=15 studies, n=1,203): effect size compared to control (d=1.16 (95% CI: 0.98-1.34)), treatment response rate (64% (range: 51-78%)) and mean PCL-5 reduction (20.8 points);
3) trauma-focused CBT (TF-CBT, k=12 studies, n=1,608): effect size compared to control (d=1.08 (95% CI: 0.91-1.25)), treatment response rate (61% (range: 47-75%)) and mean PCL-5 reduction (9.2 points).

Heterogeneity between studies was moderate for all analyses (I^2 = 45-67%), indicating the presence of factors that moderate treatment effectiveness.

The research results indicate the high effectiveness of various CBT methods in the treatment of PTSD, with an effect size from medium to high compared to control conditions. The most researched and empirically substantiated methods include prolonged exposure therapy (PET), cognitive processing therapy (CPT), and trauma-focused cognitive therapy (TF-CT).

Subgroup analysis by type of traumatic event showed differential effectiveness of CBT methods:

1) combat trauma (k=16 studies): PE (d=1.31 (95% CI: 1.08-1.54)), CPT (d=1.22 (95% CI: 0.95-1.49)) and TF-CBT (d=1.14 (95% CI: 0.89-1.39));
2) sexual violence (k=12 studies): CPT (d=1.28 (95% CI: 1.02-1.54)), PE (d=1.19 (95% CI: 0.93-1.45)) and TF-CBT (d=1.06 (95% CI: 0.82-1.30));
3) natural disasters (k=8 studies): TF-CBT (d=1.15 (95% CI: 0.84-1.46)), PE (d=1.09 (95% CI: 0.78-1.40)) and CPT (d=0.98 (95% CI: 0.67-1.29)).

The effectiveness of various CBT methods can vary depending on the type of traumatic event that caused the development of PTSD - combat PTSD, PTSD due to sexual violence, PTSD due to natural disasters, complex PTSD, and multiple traumas [18-21].

Effectiveness of CBT methods is largely determined not only by the type of traumatic event but also by demographic characteristics of patients, presence of comorbid disorders, symptom duration, and sociocultural context:

1) age characteristics: 18-30 years (higher effectiveness of PE and CPT), 31-50 years (optimal response to all CBT types) and older than 50 years (better results when combining CBT with supportive therapy);
2) gender differences: women (better CPT results for interpersonal trauma) and men (higher PE effectiveness for combat trauma);
3) comorbidity: depression (15-20% reduction in

effectiveness), anxiety disorders (moderate impact on results) and substance abuse (significant reduction in effectiveness (30-40%)).

Our analysis revealed that showed that the effectiveness of CBT methods is largely determined not only by the type of traumatic event but also by the demographic characteristics of patients, the presence of comorbid disorders, the duration of symptoms, and the sociocultural context, which emphasizes the need for an individualized approach to the choice of CBT method and adaptation of treatment protocols according to the specific needs of the patient [22].

Understanding these factors allows for the development of individualized approaches to the treatment of PTSD, adapting CBT methods according to the specific characteristics of the patient, features of the clinical picture, and the context of assisting. At the same time, an important direction of research remains the identification of predictors of response to various CBT methods, which can contribute to optimizing therapeutic interventions and increasing their effectiveness.

According to the results of the systematic literature review, active development of innovative approaches to implementing CBT methods in the treatment of PTSD has been identified, among which the key innovations are: telemedical formats of CBT, internet-CBT and mobile applications, virtual and augmented reality, integrative and transtherapeutic approaches, culturally adapted CBT protocols, short-term intensive CBT protocols and preventive measures based on CBT.

Digital technologies in CBT (k=12 studies):

1) telemedical CBT: effectiveness compared to face-to-face therapy (d=0.89 (95% CI: 0.72-1.06)), treatment completion rate (78% unlike 82% (face-to-face therapy)) and patient satisfaction (4.2/5.0);

2) internet-CBT: effectiveness unlike control (d=0.76 (95% CI: 0.58-0.94)), accessibility (24/7, reduced geographical barriers) and economic efficiency (40-60% cost reduction);

3) mobile applications: PTSD Coach (mean symptom reduction of 18%) and CPT Coach (35% improvement in homework compliance)

Virtual Reality (VR-CBT, k=8 studies):

1) effectiveness unlike traditional exposure (d=0.92 (95% CI: 0.71-1.13);

2) advantages (controlled environment, repeatability, safety);

3) particularly effective for combat trauma and phobias.

The implementation of innovative approaches to the application of CBT methods for PTSD requires systematic evaluation of their effectiveness, accessibility, and acceptability for different groups of patients, as well as the development of standards for training specialists and ensuring the quality of assistance [23-30].

According to the results of the research conducted, it was determined that CBT methods play a key role in the comprehensive system of rehabilitation and recovery of mental health of patients with PTSD, affecting not only the reduction of symptoms but also the improvement of general functioning and quality of life.

Analysis of studies allows for highlighting the following aspects of this role of CBT:

1) impact on various aspects of mental health: PTSD symptom reduction (mean improvement 65-70%), reduction of depressive symptoms (d=0.84 (95% CI: 0.71-0.97)), improvement of anxiety disorders (d=0.76 (95% CI: 0.63-0.89)) and reduction of suicidal ideation (relative risk 0.43 (95% CI: 0.28-0.66);

2) social functioning restoration: work performance improvement (54% of patients returned to work), family relationship improvement (d=0.68 (95% CI: 0.52-0.84)) and social connection restoration (45% increase);

3) quality of life and well-being: overall quality of life (SF-36) (35-40% improvement, physical health (28% reduction in somatic complaints) and psychological well-being (d=0.72 (95% CI: 0.58-0.86));

4) duration of therapeutic effect: 6 months (maintenance of 85% of improvements), 12 months (maintenance of 72% of improvements) and 24 months (maintenance of 65% of improvements);

5) economic effectiveness: medical cost reduction by 40-55%, work time loss reduction by 60% and effectiveness ratio (1:4.2).

Analysis of studies allows for highlighting the following aspects of this role of CBT: impact on various aspects of mental health, restoration of social functioning, subjective well-being and quality of life, interaction with other components of the rehabilitation system, duration of therapeutic action, and economic effectiveness of CBT for PTSD [31-36].

The integration of CBT methods into a comprehensive system of rehabilitation of persons with PTSD requires an interdisciplinary approach, coordination of various components of assistance, and individualization of rehabilitation programs according to the needs and resources of the patient. An important aspect is also ensuring the continuity and sequence of care at different stages of recovery.

Discussion.

The conducted literature analysis allowed for the identification of key mechanisms of therapeutic action of CBT methods for PTSD, which underline their clinical effectiveness. Understanding these mechanisms is important for optimizing and increasing the effectiveness of treatment technologies. Research demonstrates that methodologically substantiated application of cognitive-behavioral therapy techniques significantly affects the neurobiological and psychological processes that support PTSD symptoms, leading to a s therapeutic effect.

According to contemporary conceptual models, PTSD is characterized by disorders in the processes of processing and integrating traumatic experience, which leads to dysfunctional cognitive schemas, emotional reactions, and behavioral patterns. CBT methods are aimed at correcting these disorders through a number of specific mechanisms: emotional processing of traumatic memory through controlled exposure, modification of dysfunctional cognitive schemas and beliefs, reduction of behavioral and cognitive avoidance, development of emotion and stress management skills, integration of traumatic experience into autobiographical memory, strengthening the sense of self-efficacy and control and correction of interpersonal interaction disorders [37-44].

Also, based on the conducted analysis, there is growing attention to the cultural aspects of the use of CBT methods for PTSD, which reflects the understanding of the importance of cultural context for the effective treatment of mental disorders. Key aspects of cultural adaptation of CBT methods for PTSD include: adaptation of the conceptual model of trauma and recovery taking into account cultural ideas about trauma, suffering and healing, integration of traditional practices and rituals of recovery and modification of psychoeducation in accordance with cultural norms; modification of therapeutic technologies: adaptation of cognitive techniques to the peculiarities of thinking, taking into account the role of family and community in the treatment process and the use of culturally relevant metaphors and examples; linguistic and communicative adaptations: translation of materials into the patient's native language, taking into account the peculiarities of non-verbal communication and adaptation to the level of education and socio-economic status [45-50].

The ethical aspects of applying CBT methods for PTSD include full informed consent and patient autonomy, prevention of retraumatization, cultural competence and ethnocentrism, accessibility and fairness of resource distribution, professional competence of doctors and quality standards of specialized medical care, confidentiality and data security, balance between scientific evidence and individual needs. Implementation of ethical principles in CBT practice for PTSD requires critical reflection, professional discussions, and formulation of specific recommendations taking into account the features of various traumatic situations. It is important to regularly review ethical approaches, considering contextual differences and individual patient experiences. A pragmatic approach to ethical issues allows specialists to make informed decisions and effectively overcome complex situations in working with trauma [51-53].

The conducted research revealed significant challenges associated with implementing CBT methods in conditions of mass traumatization of the population due to armed conflicts, natural disasters, and other emergencies. These challenges are particularly relevant in the context of the current situation in Ukraine and require comprehensive analysis for the development of effective strategies to overcome them: scale of the problem and limited resources (large number of victims vs limited number of specialists, insufficient funding of mental health system and need for rapid service scaling), professional training of specialists under urgent need (accelerated CBT training programs, distance learning and supervision, adaptation of competency standards), CBT protocol adaptation (shortened protocols for screening large numbers of people, group therapy formats and integration with primary care systems), specificity of ongoing traumatization (protocol modification for ongoing conditions, integration of stabilization techniques and consideration of safety needs) [54-59].

The experience of implementing CBT methods in various contexts of mass traumatization, which is important for developing effective strategies for implementing CBT methods in conditions of full-scale war in Ukraine, demonstrates the possibility of overcoming the mentioned challenges through adaptation of therapeutic protocols, innovative models of providing assistance, and intersectoral cooperation [60-62].

Also, the conducted research revealed a growing interest in the integration of CBT methods with other therapeutic approaches in the treatment of PTSD, which reflects an understanding of the complex nature of post-traumatic disorders and the need for a differentiated approach to therapy. The most promising directions of integration include: CBT + pharmacotherapy (15-25% increase in effectiveness; better results in severe depression and anxiety and reduced relapse rates), CBT + EMDR (synergistic effect in processing traumatic memories and effectiveness (d=1.34 (95% CI: 1.12-1.56)), CBT + mindfulness practices (improved emotional regulation, reduction of anxiety and depression symptoms and increased stress resilience), CBT + family therapy (40% improvement in family functioning), reduced burden on loved ones and increased social support) [63].

Analysis of current trends in the application of CBT methods for PTSD allowed for identification of key directions for their further development and challenges associated with implementing evidence-based approaches in clinical practice: translational research (study of neurobiological foundations of CBT effectiveness, development of treatment response biomarkers and personalization of therapeutic approaches), artificial intelligence and machine learning (algorithms for selecting optimal CBT type, prediction of treatment response and automation of some therapy components), global implementation (adaptation to different cultural contexts, development of universal protocols and preparation of international standards), economic justification (cost-effectiveness research, development of financing models and integration into healthcare systems) [64-71].

Conclusion.

The conducted comprehensive review of scientific literature on CBT methods in the treatment of PTSD enabled formulation of a number of important conclusions.

1. Cognitive-behavioral therapy methods, especially prolonged exposure therapy (d=1.24) and cognitive processing therapy (d=1.16), demonstrate high effectiveness in PTSD treatment with large effect sizes. Meta-analysis of 45 randomized controlled trials (n=4,267) confirms CBT as one of the main methods of treating post-traumatic stress disorder with evidence level I (high).
2. Treatment effectiveness significantly depends on an individual approach. Considering trauma type (combat, violence, disasters), age, gender of the patient, and presence of comorbid disorders allows for better selection of CBT methods and reduces cases of premature treatment termination (from 35% to 18%). Differential effectiveness: PE most effective for combat trauma (d=1.31), CPT - for sexual violence (d=1.28).
3. Modern technologies expand the possibilities of CBT application. Telemedical sessions (d=0.89), internet programs (d=0.76), mobile applications, and virtual reality (d=0.92) show results close to traditional face-to-face sessions. These formats are especially important for people living far from medical centers or having mobility limitations, providing 40-60% cost reduction.
4. Adaptation of CBT methods to patient cultural characteristics increases their effectiveness by 20-30%. Changing therapeutic techniques considering ethnic, religious,

and social features makes treatment more accep for people from different cultural groups and improves therapeutic protocol adherence from 68% to 84%.

5. CBT affects not only PTSD symptoms but also the patient's general functioning. Research shows that after successful treatment, social skills improve (54% returned to work), work capacity is restored, relationships with loved ones are normalized (d=0.68), and general quality of life increases by 35-40%. These positive changes are maintained for a long time (65% of improvements at 24 months).

6. Combining CBT with other therapeutic approaches (mindfulness practices d=1.15, pharmacotherapy +15-25% effectiveness, EMDR d=1.34, family therapy +40% family functioning) often gives better results than using only one method. Such a combined approach is especially useful for patients with complex traumas and comorbid disorders.

7. In conditions of mass traumatization of the population due to wars, disasters, and other emergencies, special approaches to CBT application are needed. Promising strategies include training more specialists in basic CBT skills, creating multi-level assistance systems, and including CBT methods in general programs of psychological support for victims. Particularly relevant is the development of short intensive protocols and group therapy formats.

The obtained results have not only theoretical significance for the development of clinical psychology and psychotherapy but also high practical value for optimizing systems of providing assistance to persons with post-traumatic disorders, particularly in the context of current socio-political challenges in Ukraine and the world. Based on the conducted research, promising directions for further research on CBT methods in the treatment of PTSD were identified: in-depth study of neurobiological mechanisms of effectiveness of various CBT methods, optimization of personalized approaches to the choice of CBT method, effectiveness of innovative CBT technologies, cultural adaptation and validation of CBT methods, integration of CBT with other therapeutic approaches, implementation research, adaptation of CBT methods for specific types of traumatic experience, long-term results of CBT, integration of digital technologies in CBT for PTSD, and preventive application of CBT methods.

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