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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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THE ROLE OF SOCIAL DEPRIVATION FACTORS AND QUALITY OF LIFE IN ADULTS WITH METABOLIC SYNDROME: A NARRATIVE REVIEW

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Abstract.

Introduction: Metabolic syndrome (MetS) is characterized by a cluster of interconnected chronic conditions – abdominal obesity, dyslipidemia, insulin resistance, and hypertension. MetS is highly prevalent among adults and is closely associated with chronic diseases, significantly increasing the risk of cardiovascular disease and type 2 diabetes. Beyond physiological changes, MetS substantially impacts quality of life, work capacity, and psychosocial well-being. In recent years, there has been growing scientific interest in non-biological factors influencing health, particularly social deprivation. Despite numerous studies on MetS, research comprehensively addressing the impact of social deprivation on quality of life remains limited. Most studies focus primarily on clinical indicators and do not fully capture aspects such as social isolation, economic inequality, educational level, and limited social support. This review systematizes the existing evidence on the relationship between social deprivation and quality of life in adults with metabolic syndrome. **Aim:** to analyze literature data on the relationship between social deprivation and quality of life in adults with metabolic syndrome.

Search Strategy: A systematic literature search was conducted using PubMed, Scopus, Web of Science, and Google Scholar, covering publications from 2015 to 2025. Keywords included "metabolic syndrome," "social deprivation," "socioeconomic factors," "and quality of life." Inclusion criteria comprised original research, systematic reviews, and meta-analyses examining associations between MetS, quality of life, and social deprivation in adults.

Results: The review highlights significant reductions in physical, psychological, and social components of quality of life among individuals with MetS. The most pronounced negative outcomes were observed in individuals with low socioeconomic status and limited social support. Evidence from multiple studies indicates that social deprivation, encompassing unfavorable economic and living conditions and restricted access to resources, acts as an independent factor exacerbating the consequences of MetS.

Conclusions: This review emphasizes the importance of considering social deprivation as a critical determinant of quality of life in adults with MetS. Incorporating social factors into clinical and public health strategies may improve prevention, intervention, and management programs, ultimately enhancing health outcomes and reducing the burden of MetS. Further research is needed to develop integrated models combining biomedical and social determinants of health.

Key words. Metabolic syndrome, social deprivation, socioeconomic factors, quality of life.

Introduction.

Metabolic syndrome (MetS) is a cluster of interrelated metabolic disturbances, including abdominal obesity, insulin resistance, dyslipidemia, and arterial hypertension, which significantly increases the risk of cardiovascular diseases and type 2 diabetes mellitus in adult patients [1]. MetS is recognized as a systemic metabolic disorder with multifactorial pathogenesis, significantly burdening healthcare systems and affecting morbidity and mortality. Comparative studies across regions show that the prevalence of MetS varies depending on diagnostic criteria (WHO, NCEP-ATP III, IDF, and harmonized), emphasizing the need for standardized approaches to diagnosis and epidemiological monitoring [2]. These data indicate that metabolic syndrome is not only a clinical issue but also a significant epidemiological and methodological problem. MetS is not limited to economically developed countries; it is also widespread in developing nations, allowing it to be considered a global public health concern. According to international estimates, approximately 25% of the adult population in various regions of the world exhibits signs of metabolic syndrome [3].

According to the World Health Organization, one in every six people worldwide dies from cardiovascular diseases before reaching the age of 70, clearly highlighting the relevance of this issue. In the structure of premature mortality, non-communicable diseases play a leading role, among which cardiovascular diseases account for 33.5% of all cases. At the same time, the mortality rate from cardiovascular diseases in Eastern European and Central Asian countries is approximately five times higher than the corresponding indicators in Western Europe. According to Dr. Hans Kluge, Director of the WHO Regional Office for Europe, non-communicable diseases are responsible for about 90% of all deaths in the European region [4,5]. The prevalence of metabolic syndrome among the population of the Russian Federation was studied by Bikbov et al. in the study "Prevalence of metabolic syndrome in a Russian population: The Ural Eye and Medical Study and the Ural Very Old Study." According to the study results, metabolic syndrome was identified in 26.7% of the adult population, and among individuals over 85 years of age, its prevalence reaches 43.1%, indicating an increase in the syndrome's frequency with age [6].

In the countries of the WHO European Region, the prevalence of metabolic syndrome generally ranges from 20% to 30%, with no significant differences observed between men and women [7].

According to domestic studies, the prevalence of metabolic syndrome among the adult population of Kazakhstan is 30–40%. Age-specific analysis shows a gradual increase in the frequency of MetS in both sexes. Among men, the indicators are distributed as follows: 30–39 years — 3.2%, 40–49 years — 12.2%, 50–59

years — 14.6%, 60–69 years — 22.6%. Among women, there are less than 5% of cases at 30–39 years, 17% at 40–49 years, 30.8% at 50–59 years, and 36.7% at 60–69 years. At the same time, in women aged 50–59 and 60–69 years, the prevalence of MetS significantly exceeds the corresponding indicators in men ($p<0.002$ and $p<0.05$, respectively) [8]. Results of previously conducted studies in the Republic of Kazakhstan, based on IDF diagnostic criteria, indicate that the frequency of metabolic syndrome reaches 21.8% among women and 23.9% among men [9].

The high prevalence of MetS in the adult population underscores its importance as one of the leading risk factors for chronic non-communicable diseases and emphasizes the need for further research aimed at studying its determinants, consequences, and preventive strategies.

Aim.

To analyze literature data on the impact of social deprivation and quality of life factors on the development, manifestations, and severity of metabolic syndrome in adults.

Search Strategy.

A literature search was conducted using PubMed, Web of Science, Google Scholar, and CyberLeninka databases, covering publications from 2015 to 2025. Keywords included "metabolic syndrome," "social deprivation," "socio-economic factors," "quality of life". Peer-reviewed full-text publications, international clinical guidelines, and contemporary statistical reports were considered. Priority was given to studies discussing epidemiological trends, diagnostic criteria, and health consequences of MetS in relation to social and economic determinants. In addition to studies published between 2015 and 2025, several earlier landmark publications were also included to provide historical background and foundational concepts related to metabolic syndrome and social deprivation.

Ethical Statement.

The analysis is based on previously published studies; therefore, no ethical committee approval or patient informed consent was required for this review.

Results and Discussion.

Although traditional studies of MetS have primarily focused on biological and behavioural risk factors, in recent years there has been growing interest in the social determinants of health—such as socio-economic status, living conditions, and social support—and their influence on the development and progression of MetS [10].

Social deprivation, reflecting unfavourable living conditions, limited access to resources, and chronic psychosocial stress, is considered one of the key factors capable of exacerbating health status and impairing quality of life in patients with chronic diseases [11,12].

At the same time, a review of the literature indicates that scientific data on the specific impact of social deprivation on the quality of life of adults with metabolic syndrome remain incomplete and fragmented. Although individual epidemiological studies demonstrate associations between socio-economic characteristics and the prevalence of MetS, as well as highlight the relationship of social factors with overall quality of life in patients with metabolic disorders, a comprehensive review of data linking social deprivation factors, metabolic syndrome, and quality of life is lacking [13].

Thus, the aim of the present article is to analyse and summarize current domestic and international research on the impact of social deprivation factors on quality of life in adults with metabolic syndrome, as well as to identify key knowledge gaps requiring further investigation.

Epidemiology of Metabolic Syndrome and its Impact on Quality of Life.

MetS, previously known as insulin resistance syndrome or syndrome X, represents a cluster of interrelated metabolic risk factors that substantially increase the likelihood of developing cardiovascular diseases, as well as cardiovascular morbidity and mortality [9,14-16].

Between 1990 and 2021, all countries and global populations experienced a steady increase in the number of adults with overweight and obesity. As of 2021, approximately one billion men and 1.11 billion women were affected by overweight and obesity. The highest growth rates were recorded in low- and middle-income countries, particularly in regions of North Africa, Asia, the Middle East, and sub-Saharan Africa. If current trends continue, by 2025 the number of adults with overweight and obesity is projected to reach 3.8 billion, accounting for more than half of the global adult population [17-19].

Obesity is a medical condition characterized by excessive accumulation of body fat, which increases health risks. The World Health Organization (WHO) defines obesity as a body mass index (BMI) ≥ 30 kg/m^2. In addition to BMI, central obesity is an important predictor of health risk, as fat accumulation in the abdominal area is associated with metabolic and cardiovascular disturbances [19,20].

According to estimates, $39.9 \pm 0.7\%$ of the adult population in Asia, $29.2 \pm 0.7\%$ in Europe, and $34.3 \pm 0.8\%$ in the United States suffer from MetS [21-23]. It is widely recognized that MetS plays a significant role in the development of multiple non-communicable diseases, such as type 2 diabetes and cardiovascular diseases (CVDs), which together account for approximately 41 million deaths annually worldwide. The prevalence of MetS varies depending on multiple factors, including genetics, biological characteristics, and social determinants. Over the past decade, the frequency of MetS among adults has increased in both developed and developing countries [24-27].

Numerous studies indicate that an individual's overall health status—including both dental and metabolic health—along with lifestyle factors such as smoking, insufficient physical activity, and unbalanced nutrition, in combination with psycho-emotional factors, significantly influence the development and further progression of metabolic syndrome (MetS) (Figure 1) [28-30].

Figure 1 illustrates the complex interaction between behavioural, clinical, and social determinants contributing to the development of metabolic syndrome. Behavioural risk factors such as smoking, physical inactivity, unhealthy diet, and alcohol consumption interact with metabolic abnormalities including

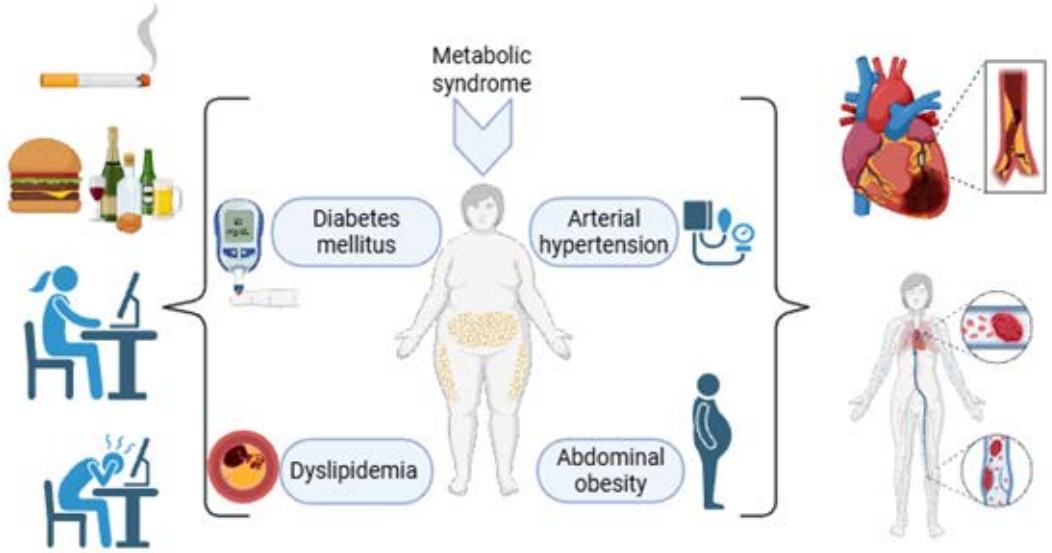

Figure 1. *Multifactorial Model of the Development and Progression of Metabolic Syndrome.*

obesity, hypertension, dyslipidemia, and insulin resistance. These combined mechanisms significantly increase the risk of cardiovascular diseases and negatively affect patients' quality of life.

The problem has global significance and remains relevant, since even with various lifestyle and dietary adjustments, a decline in quality-of-life indicators is observed among patients suffering from this condition [31,32]. Several studies have shown that personality traits and overall quality of life may play a protective role against the development of metabolic syndrome, indicating a potential influence of psycho-emotional state on the risk of MetS [33], especially among adolescents.

Chronically elevated inflammatory processes inherent to metabolic syndrome negatively affect patients' quality of life and mental health [34]. Furthermore, research indicates that mental disorders may be influenced not only by the hypertension component included in MetS but also by metabolic syndrome itself as an independent factor [35].

Among individuals with metabolic syndrome, the prevalence of low physical activity remains high, which can exacerbate the adverse impact of MetS on health and reduce quality of life [36,37].

The persistent negative effects of MetS on physical health emphasize the importance of targeted interventions in these key components to improve overall patient well-being, considering that limited physical activity and deteriorating physical condition may further amplify MetS manifestations, including obesity [38].

Pérez-Galarza et al., conducted a national survey of the adult population in Ecuador and identified a high prevalence of MetS. The prevalence of MetS was higher in urban areas, low-altitude regions, and among individuals with higher socioeconomic status [39].

MetS is one of the most widespread medical and social problems, with its prevalence continuing to increase both in developing economies and in industrially developed countries [40,41].

The formation of MetS is driven by a complex interaction of multiple factors, among which psychosocial determinants, genetic predisposition, and environmental factors are particularly significant [42].

In addition to pronounced medical consequences, scientific literature increasingly emphasizes the negative impact of metabolic syndrome on health-related quality of life [43-47].

Most studies have found that the presence of MetS is associated with a reduction in patients' subjective assessment of quality of life [21,48,49].

According to data from the study by Smirnova et al. (2022), patients with metabolic syndrome show a more pronounced deterioration in quality-of-life scores measured using the SF-36 scale, primarily due to reduced physical functioning and mental well-being [46,50].

In the study conducted by Mahambetalieva et al. (2018) titled "Assessment of Quality of Life in Patients with Metabolic Syndrome," 300 respondents—residents of Kazakhstan comparable by sex and age (153 women [51%] and 147 men [49%])—participated. Participants were divided into three groups: patients with metabolic syndrome, a group without MetS, and a control group of practically healthy individuals. The SF-36 Health Status Survey was used to assess physical and psychological components of quality of life. Results showed that both components of quality of life in patients with metabolic syndrome were statistically significantly lower ($p<0.05$) than in the control group and the group without MetS. Moreover, the reduction in physical (66.5%) and psychological (74%) quality of life components directly depended on the duration of the disease and the severity of its individual components [8]. These findings underscore the significant negative impact of metabolic syndrome on the quality of life of residents of Kazakhstan and highlight the need for a comprehensive approach to its management, including medical, psychological, and social measures.

Table 1. *Comparative Characteristics of Quality-of-Life Assessment Scales by Validation Parameters and Application.*

Scale	Full Name	Countries and Languages of Validation	Type of Studies	Validation Status
SF-36	Short Health Survey (36 items)	USA, United Kingdom, Canada, Australia, Germany, Italy, Spain, Scandinavian countries	Clinical and population-based studies	Validated
SF-12	Short Health Survey (12 items)	USA, United Kingdom	Clinical and epidemiological studies	Validated
WHOQOL-BREF	WHOQOL Short Form (World Health Organization Quality of Life)	More than 20 countries: Europe, Asia, Americas, Africa (including Russia and Turkey)	Cross-cultural studies	Validated
EQ-5D	European Quality of Life Questionnaire (5 domains)	Most European countries, USA, Canada, Japan, Turkey	Clinical and pharmacoeconomic studies	Validated
COOP/ WONCA	COOP/WONCA Charts	USA, European countries, Japan	Primary health care	Validated
BRFSS	Behavioral risk factor surveillance system	USA	Population-based epidemiological surveillance	Validated
PWI	Subjective well-being index	Multicenter international studies	Socio-psychological studies	Validated
WEMWBS	Warwick–Edinburgh Mental Well-being Scale	United Kingdom, European countries	Psycho-emotional health	Validated

Mechanisms Linking Social Deprivation and Metabolic Syndrome.

In studies of quality of life among patients with metabolic syndrome, standardized instruments are widely used to assess both general and health-related quality of life. Specifically, HRQOL scales from COOP/WONCA charts have been applied in multicultural samples from the USA, the United Kingdom, Scandinavian countries, and Japan; EuroQol EQ 5D — in numerous cohorts across Europe, North America, and Asia; WHOQOL BREF — in countries of Asia, Europe, Africa, and the Americas; SF 36 and SF 12 — predominantly in English-speaking and European populations. All these instruments have undergone validation procedures, confirming their reliability and allowing their use for cross-cultural comparisons, as well as for comprehensive assessment of physical, mental, and social aspects of quality of life.

A systematic review published in BMJ Military Health (2023) provided a comparative evaluation of the main scales, including COOP/WONCA charts, SF 36, WHOQOL BREF, and OHIP 14, analysing their psychometric properties across physical, mental, social, and subjective health domains. These findings highlight the importance of using validated instruments in the study of quality of life among patients with metabolic syndrome and provide a reliable basis for cross-cultural and clinical analysis.

A comparative analysis of quality-of-life scales according to validation parameters and features of their application is systematized and presented in Table 1.

Among the most frequently used instruments for assessing quality of life in patients with metabolic syndrome are the WHOQOL-BREF and SF-36 questionnaires. These instruments allow the evaluation of multiple domains, including physical health, psychological wellbeing, social functioning, and environmental conditions. Their multidimensional structure makes them particularly useful for studies examining the relationship between social deprivation and health outcomes, as they capture both clinical and social aspects affecting patients' quality of life.

Socio-economic deprivation is recognized as a major factor contributing to the development and persistence of metabolic disorders through both direct mechanisms, such as limited access to healthy food, and indirect pathways, including chronic psychosocial stress. Townsend (1987) defined deprivation as a state of observable disadvantage relative to the living standards of the community or society to which an individual or group belongs. As a key social determinant of health, socio-economic deprivation reflects environmental and lifestyle conditions that significantly affect metabolic health across specific geographic areas. However, while previous research has primarily examined the association between residential deprivation and chronic non-communicable diseases, the specific role of socio-economic deprivation in the development of metabolic syndrome remains insufficiently explored [51].

In the meta-analysis by Blanquet et al., the association between socio-economic status and the development of metabolic syndrome is examined. The authors consider social deprivation as a combination of adverse socio-economic conditions that limit access to resources and contribute to health inequality. The analysis takes into account approaches by J. Vrezinsky, who defined deprivation as the lack of safety conditions allowing an individual or family to perform professional and social duties, and Townsend, who viewed deprivation as an adverse position of an individual or family relative to society, distinguishing it from poverty. A review of the literature shows that the prevalence of metabolic syndrome is associated with age, sex, education level, income, and marital status [52].

MetS is primarily driven by insulin resistance, which increases the risk of cardiovascular disease and type 2 diabetes. Key risk factors—blood pressure, glucose, and lipid levels—are closely linked to socio-economic status, including education and living conditions. Social deprivation, reflecting limited access to resources and adverse economic conditions, further elevates this risk. While previous studies note higher prevalence among individuals with low socio-economic status, causal understanding has been limited by insufficient theoretical models and neglect of interdependencies between syndrome components. This study proposes a model linking socio-economic factors to metabolic syndrome using multivariate regression that accounts for these interrelations [13].

Blanquet et al. (2016) conducted a multicenter cross-sectional study in France to examine the link between socio-economic deprivation and metabolic syndrome (MetS) and to identify optimal waist circumference thresholds for diagnosis. The study included 32,374 participants aged 16 and older, with socio-economic deprivation measured using the EPICES scale. MetS prevalence ranged from 16.3% to 22.2%, depending on waist circumference criteria, and 39.4% of participants were socio-economically disadvantaged. Social deprivation emerged as an independent factor associated with MetS. Waist circumference analysis suggested optimal thresholds of 94 cm for men and 88 cm for women, within observed ranges of 95–99 cm for men and 88–97 cm for women [53].

Tienlynn et al. (2025) demonstrated that social deprivation, assessed via the SDI, significantly mediates racial differences in the prevalence of MetS among patients with hyperandrogenic PCOS (polycystic ovary syndrome), particularly influencing elevated blood pressure and reduced HDL cholesterol, highlighting the need to consider social determinants of health in the prevention and management of high-risk patients [54].

In the study "Socio-economic Status and MetS in Southwest Iran: Results of the Hoveyzeh Cohort Study (HCS)" by N. Saki et al., socio-economic status was assessed using a multilevel approach. The territorial indicator was the Townsend Deprivation Index, while the Wealth Index reflected household-level socio-economic status. Additionally, education and professional qualifications were used as individual indicators of socio-economic status [55].

The Wealth Index was constructed by analysing household material assets, including ownership of appliances, vehicles, communication tools, internet access, and housing features such as home ownership and living space. Principal Component Analysis (PCA) determined the relative weight of each indicator, with the first component used to create a composite wealth measure, later divided into quintiles to define five socio-economic categories. The Townsend Deprivation Index was calculated using standardized procedures, assessing households without cars, homeownership, unemployed adults, and overcrowding. Logarithmic transformations were applied to unemployment and overcrowding indicators, followed by Z-score standardization. The final index, representing key aspects of material deprivation, was summed and divided into quintiles to classify population groups by socio-economic level [56].

A key area of epidemiological monitoring is the study of the relationship between population living conditions and disease prevalence. This study focuses on socio-economic and environmental characteristics of the living environment, considered manifestations of deprivation. Deprivation refers to an objectively measured or subjectively perceived lack of resources necessary to maintain a certain quality of life. These resources include population income, food quality, housing conditions, and environmental status, which are considered usual or socially significant for various socio-economic population groups [57-59]. La Rosa et al. assessed the relationship between individual deprivation and metabolic syndrome prevalence using the EPICES scale, which includes 11 questions on marital status, health insurance, economic status, family support, and leisure. The scale reflects social, economic, and psychological aspects of life. The study found that the most deprived participants had a 22% higher prevalence of metabolic syndrome [60]. Blanquet et al., confirmed these findings, showing that the risk of metabolic syndrome among deprived respondents increased by 2.69 times (OR 2.69; 95% CI 2.38–3.05) [53].

The EPICES scale identifies socially deprived patients in Europe, but evidence linking regional deprivation to metabolic syndrome is limited. Using 2010 All-Russian Census data, a composite index of social, economic, and environmental deprivation was analysed via principal component analysis and divided into quartiles. Overall deprivation was not significantly associated with metabolic syndrome; however, social deprivation reduced risk in women and the total population, economic deprivation increased risk of metabolic syndrome, hyperglycemia, and hypertension, and environmental deprivation was linked to higher blood pressure and hyperglycemia, especially in women. These findings indicate that the impact of regional deprivation depends on its components, sex, and specific health outcomes [61].

Regional Disparities: A Case Study of Kazakhstan.

Socio-economic deprivation in Kazakhstan is considered a significant factor affecting population health and the development of metabolic disorders. The study by Moldabekov et al., analysing household poverty levels in Kazakhstan, revealed significant regional differences in socio-economic living conditions. The authors showed that uneven income distribution, limited access to healthcare services, and insufficient nutrition contribute to adverse living conditions, increasing the risk of chronic non-communicable diseases. These findings emphasize the importance of considering socio-economic factors in designing preventive programs and health improvement strategies [62].

The phenomenon of multidimensional deprivation is discussed as a complex socio-economic phenomenon characterized by simultaneous deficits in basic population needs, including medical, educational, infrastructural, and socio-cultural resources. The severity of material deprivation in Spanish regions and the role of European Structural Funds [63].

Unlike traditional approaches based mainly on income assessment, multidimensional analysis allows a more complete identification of factors of household social vulnerability and mechanisms of poverty reproduction. Measuring the unmeasurable: decomposition of multidimensional rural poverty and promotion of economic development in the poorest region of Luzon, Philippines [64].

It has been shown that manifestations of deprivation vary significantly depending on regional characteristics, economic development level, infrastructure availability, and social policy [65].

Specifically, rural areas often face limited access to healthcare and education, transport, and digital infrastructure, while urban areas are characterized by housing accessibility issues, social isolation of certain population groups, and educational inequality [66].

Different forms of deprivation have interconnected negative effects on population health, economic activity, and social

mobility. Medical deprivation contributes to increased morbidity and reduced workforce productivity, educational deprivation limits professional prospects and exacerbates social inequality [67], and infrastructural deprivation hinders regional economic development [68].

Furthermore, socio-cultural deprivation limits opportunities for social integration of certain population groups [69].

Special attention is paid to the use of multidimensional poverty assessment methods, including Alkire–Foster, Bristol Deprivation Scales, and MODA, which allow for the consideration of complex social deprivations [62,70,71]

In several countries, indicators of poverty and social isolation risk combine income and material deprivation assessments. Multidimensional poverty in the Baltic countries in the EU context: theoretical and practical aspects [72].

Research results indicate persistent regional differences in household well-being in Kazakhstan and highlight the significant impact of economic crises, gender inequality, and limited access to education, healthcare, and housing on social vulnerability [71,73-75].

Therefore, the development of comprehensive social programs aimed at reducing multidimensional poverty and increasing household resilience is emphasized.

Despite the growing number of studies examining metabolic syndrome and quality of life, several methodological limitations should be considered. Many studies rely on cross-sectional designs, which limits the ability to establish causal relationships between social deprivation and metabolic disorders. In addition, differences in socioeconomic indicators and quality-of-life assessment tools complicate direct comparisons between studies conducted in different regions. Future research should focus on longitudinal designs and standardized assessment approaches to better understand the complex interactions between social determinants and metabolic health.

Conclusion.

Metabolic syndrome is a widespread public health issue associated with obesity and reduced quality of life, particularly in physical and psycho-emotional domains. Social determinants, including low education, limited access to resources, poor living conditions, and chronic psychosocial stress, increase the risk of MetS. The impact of deprivation varies by sex, age, and region. Despite extensive data on MetS prevalence, the relationship between social deprivation, MetS, and adult quality of life remains insufficiently studied. Integrating clinical, socio-economic, and behavioural factors is essential for developing effective prevention strategies and improving population well-being.

Conflict of interest.

The authors declare that there is no conflict of interest, and that no part of this article has been published in the open press and is not under consideration by other publishers.

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მეტაბოლური სინდრომის მქონე მოზრდილებში სოციალური დეპრივაციის ფაქტორებისა და ცხოვრების ხარისხის როლი: ნარატიული მიმოხილვა

ანოტაცია

შესავალი: მეტაბოლური სინდრომი (მს) განისაზღვრება როგორც ურთიერთდაკავშირებული ქრონიკული მდგომარეობებისკომპლექსი,მათშორისაბდომინალური

სიმსუქნე, დისლიპიდემია, ინსულინრეზისტენტობა და არტერიული ჰიპერტენზია, რომლებიც მეტაბოლური დარღვევების შედეგად ვითარდება. მს ფართოდ არის გავრცელებული ზრდასრულ მოსახლეობაში და მჭიდროდ არის დაკავშირებული ქრონიკულ დაავადებებთან, მნიშვნელოვნად ზრდის გულ-სისხლძარღვთა დაავადებებისა და ტიპი 2 შაქრიანი დიაბეტის რისკს. ფიზიოლოგიური ცვლილებების გარდა, მს არსებით გავლენას ახდენს ცხოვრების ხარისხზე, შრომისუნარიანობასა და ფსიქოსოციალურ კეთილდღეობაზე. ბოლო წლებში იზრდება ინტერესი ჯანმრთელობაზე მოქმედი არაბიოლოგიური ფაქტორების მიმართ, განსაკუთრებით სოციალური დეპრივაციის მიმართ. მიუხედავად მრავალი კვლევისა მს-ის შესახებ, სოციალური დეპრივაციის გავლენის კომპლექსური შეფასება ცხოვრების ხარისხზე შეზღუდულია. კვლევების უმრავლესობა კონცენტრირებულია კლინიკურ მაჩვენებლებზე და სრულად არ მოიცავს ისეთ ასპექტებს, როგორიცაა სოციალური იზოლაცია, ეკონომიკური უთანასწორობა, განათლების დონე და სოციალური მხარდაჭერის შეზღუდულობა. წარმოდგენილი მიმოხილვა სისტემატიზაციას უკეთებს არსებულ მონაცემებს სოციალური დეპრივაციისა და ცხოვრების ხარისხის ურთიერთკავშირზე მს-ის მქონე ზრდასრულებში.

მიზანი: მეტაბოლური სინდრომის მქონე ზრდასრულებში სოციალური დეპრივაციისა და ცხოვრების ხარისხის ურთიერთკავშირის შესახებ ლიტერატურული მონაცემების ანალიზი.

ძიების სტრატეგია (მასალა და მეთოდები): ლიტერატურის სისტემატური ძიება განხორციელდა PubMed, Scopus, Web of Science და Google Scholar ბაზებში, მოიცავდა 2015–2025 წლებში გამოქვეყნებულ ნაშრომებს. გამოყენებული საკვანძო სიტყვები იყო: „მეტაბოლური სინდრომი“, „სოციალური დეპრივაცია“, „სოციალურ-ეკონომიკური ფაქტორები“, „ცხოვრების ხარისხი“. ჩართული იყო ორიგინალური კვლევები, სისტემატური მიმოხილვები და მეტაანალიზები, რომლებიც აფასებდნენ ასოციაციებს მს-ს, ცხოვრების ხარისხსა და სოციალურ დეპრივაციას შორის ზრდასრულ მოსახლეობაში.

შედეგები: მიმოხილვამ აჩვენა ცხოვრების ხარისხის ფიზიკური, ფსიქოლოგიური და სოციალური კომპონენტების მნიშვნელოვანი შემცირება მს-ის მქონე პირებში. ყველაზე გამოხატული უარყოფითი შედეგები დაფიქსირდა დაბალი სოციალურ-ეკონომიკური სტატუსისა და შეზღუდული სოციალური მხარდაჭერის მქონე პირებში. მრავალმა კვლევამ დაადასტურა, რომ სოციალური დეპრივაცია წარმოადგენს დამოუკიდებელ ფაქტორს, რომელიც აძლიერებს მს-ის შედეგებს, მათ შორის არასახარბიელო ეკონომიკურ პირობებს, რესურსებზე შეზღუდულ ხელმისაწვდომობასა და ქრონიკულ ფსიქოსოციალურ სტრესს.

დასკვნები: წარმოდგენილი მიმოხილვა უსვამს ხაზს სოციალური დეპრივაციის გათვალისწინების მნიშვნელობას, როგორც ცხოვრების ხარისხის კრიტიკულ დეტერმინანტს მს-ის მქონე ზრდასრულებში. სოციალური ფაქტორების ინტეგრაცია კლინიკურ და პრევენციულ სტრატეგიებში ხელს შეუწყობს პრევენციის, ინტერვენციისა და მართვის პროგრამების გაუმჯობესებას, ჯანმრთელობის მაჩვენებლების ზრდასა და მს-ის ტვირთის შემცირებას. აუცილებელია შემდგომი კვლევები ბიომედიცინური და სოციალური დეტერმინანტების გამაერთიანებელი კომპლექსური მოდელების შესამუშავებლად.

საკვანძო სიტყვები: მეტაბოლური სინდრომი, სოციალური დეპრივაცია, სოციალურ-ეკონომიკური ფაქტორები, ცხოვრების ხარისხი.

Влияние факторов социальной депривации и качества жизни у взрослых с метаболическим синдромом: литературный обзор

Абстракт

Введение: Метаболический синдром (МС) определяется как комплекс взаимосвязанных хронических состояний, включая абдоминальное ожирение, дислипидемию, инсулинорезистентность и гипертонию, возникающих вследствие нарушений обмена веществ. МС широко распространён среди взрослых и тесно связан с хроническими заболеваниями, значительно повышая риск сердечно-сосудистых заболеваний и сахарного диабета 2 типа. Помимо физиологических изменений, МС сущетсвенно влияет на качество жизни, трудоспособность и психосоциальное благополучие. В последние годы наблюдается растущий научный интерес к небелковым факторам, влияющим на здоровье, в частности к социальной депривации. Несмотря на многочисленные исследования МС, работы, комплексно оценивающие влияние социальной депривации на качество жизни, ограничено. Большинство исследований сосредоточено на клинических показателях и не охватывает полностью такие аспекты, как социальная изоляция, экономическое неравенство, уровень образования и ограниченная социальная поддержка. Настоящий обзор систематизирует существующие данные о взаимосвязи социальной депривации и качество жизни у взрослых с метаболическим синдромом.

Цель: Проанализировать литературные данные о взаимосвязи социальной депривации и качество жизни у взрослых с метаболическим синдромом.

Стратегия поиска: Систематический поиск литературы проводился в базах PubMed, Scopus, Web of Science и Google Scholar, охватывая публикации за период сс 2015 по 2025 годы. Ключевые слова: «метаболический синдром»,

«социальная депривация», «социаально-экономические факторы», «качество жизни». Включались оригинальные исследования, систематические обзоры и мета-анализы, оценивающие ассоциации между МС, качеством жизни и социальной депривацией у взрослого населения.

Результаты: Обзор выявил значительное снижение физически, психологических и социальных компонентов качество жизни у людей с МС. Наиболее выраженные негативные последствия отмечались у лиц с низким социально-экономическим статусом и ограниченной социальной поддержкой. Данные многочисленных исследований подтверждают, что социальная депривация – это независимый фактор, усиливающий последствия МС, включая неблагоприятные экономические условия, ограниченный доступ к ресурсам и хронический психосоциальный стресс. Выводы: Настоящий обзор подчёркивает важность учета социальной депривации как критического детерминанта качества жизни взрослых с МС. Интеграция социальных факторов в клинические и профилактические стратегии может способствовать улучшению профилактики, интервенций и программ управления, повышая показатели здоровья и снижая бремя МС. Необходимые дальнейшие исследования для разработки комплексных моделей, объедияющих биомедицинские и социальные детерминанты здоровья.

Ключевые слова: Метаболический синдром, социальная депривация, социально-экономические факторы, качество жизни.