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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 ВИНТИ 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 ВИНТИ 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. Корректур авторам не высылаются, 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 computer-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 საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ 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 შედეგის 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 ფხიხლებში 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.

Martirosyan T.R. ON THE RESULTS OF A SYSTEMIC MULTIFACTOR ANALYSIS WITH MATHEMATICAL MODELING OF THE INDICATORS OF MEDICAL EXPERTISE OF YOUNG MALES WITH SURGICAL DISEASES IN THE REPUBLIC OF ARMENIA.....	6-13
Hussam S. Ahmed, Nihad N. Hilal, Mohamed G. Zakari. EVALUATION OF VITAMIN K2 IN PATIENTS WITH TYPE 2 DIABETES MELLITUS.....	14-17
Denis Shiyan, Olga Trach, Liliia Sosonna, Nadiia Yurevych, Ganna Chekhovska, Denys Malieiev, Victoriia Alekseeva, Vitaliy Gargin. PEDAGOGICAL ASPECTS OF THE IMPACT OF SMOKING ON THE HUMAN BODY BASED ON RADIOGRAPHIC DENSITY INDICATORS OF MAXILLARY SINUS BONE WALLS.....	18-22
Tereza Azatyan. THE RHEOENCEPHALOGRAPHIC STUDY OF THE INTERHEMISPHERIC ASYMMETRY OF CEREBRAL BLOOD FLOW IN HEALTHY AND MENTALLY RETARDED CHILDREN.....	23-27
Asmaa Y Thanoon, Faehaa Azher Al-Mashhadane. RELATIONSHIP BETWEEN VITAMIN D DEFICIENCY AND CHRONIC PERIODONTITIS.....	28-32
Maia Ispireli, Irma Buchukuri, Tamar Ebanoidze, Giorgi Durglishvili, Nato Durglishvili, Nana Chkhikvishvili, Leila Beridze. CORRELATES OF ATOPIC DERMATITIS CHARACTERISTICS IN MILITARY PERSONNEL.....	33-37
Suhas Ballal, Amandeep Singh, Nimisha Jain, Harsh Bhati, Salahuddin, Devanshu J. Patel. AN IN-DEPTH ASSESSMENT OF THE TUMOR'S IMPACT ON SARCOPENIA.....	38-43
Lilia Robert Mirzoyan, Nara Azat Mkrtchyan, Sergey Nikolay Simonov, Zinaida Tital Indoyan. ASSESSMENT OF THE QUALITY OF LIFE AND PREVALENCE OF POSSIBLE OSTEOPOROTIC CHANGES IN POSTMENOPAUSAL WOMEN IN YEREVAN BASED ON DATA OF THE ECOS-16 QUESTIONNAIRE.....	44-49
Alexander Schuh, Inge Unterpainner, Stefan Sesselmann, Matthias Feyrer, Philipp Koehl. CUBITAL TUNNEL SYNDROME DUE TO AN INTRANEURAL GANGLION CYST OF THE ULNAR NERVE.....	50-52
Ahmed Mohammed Ibrahim, Bashar Sh. Mustafa, Fahad A. Jameel. PREDICTION OF IRON DEFICIENCY IN CHILDREN USING EASY LABORATORY TOOLS.....	53-56
Sharadze D. Z, Abramov A. Yu, Konovalov O.E, Fomina A.V, Generalova Yu.A, Kakabadze E. M, Bokova E. A, Mityushkina T.A, Korovushkina E.K, Kozlova Z.V, Eliseeva T.A. THE OCCURRENCE OF SPORTS INJURIES AMONG PRE-ADOLESCENTS.....	57-62
Balasis J. mahmmoed, Nihad N. Hilal, Entedhar R. Sarhat. EVALUATION OF FETUIN-A LEVEL IN POLYCYSTIC OVARY SYNDROME AND ITS ASSOCIATION WITH ASPROSIN AND SOME BIOCHEMICALPARAMETERS.....	63-66
Boldyreva Yu.V, Lebedev I.A, Zakharchuk E.V, Shhepankevich L.A, Tersenov A.O. THERAPEUTIC USE OF RESVERATROL IN THE TREATMENT OF NEUROLOGICAL AND ENDOCRINOLOGICAL PATIENTS.....	67-70
Suhas Ballal, Nabeel Ahmad, Anand Mohan Jha, Vasundhara Sharma, Rakhi Mishra, Geetika M. Patel. AN EVALUATION OF ANTIBIOTIC PRESCRIPTION PRACTICES: PERSPECTIVES OF VETERINARY TRAINEES AND PRACTICING VETERINARIANS.....	71-77
Elguja Ardia, Tamaz Gvenetadze, Teimuraz Gorgodze, Emzar Diasamidze. CHANGES IN SPERMATOGENESIS AFTER SIMULATED INGUINAL HERNIA REPAIR IN EXPERIMENT.....	78-83
Ioseb Begashvili, Merab Kiladze, George Grigolia. EFFECT OF INHALED OXYGEN CONCENTRATION ON PULMONARY GAS EXCHANGE DURING OFF-PUMP CORONARY BYPASSGRAFTING.....	84-90
Saif Aldeen Alkakaee, Jawnaa Khalid Mamdoh. COQ10 PROVIDES CARDIOPROTECTION AGAINST THE TOXIC EFFECTS OF TRASTUZUMAB AND DOXORUBICIN IN RAT MODEL.....	91-97
Geetika M. Patel, Upendra Sharma.U.S, Bhupendra Kumar, Pankti Patel, Ashish Chander, Pankaj Kumar Tyagi. UNDERSTANDING THE VITAL DETERMINANTS SHAPING LEARNERS' PHYSICAL ACTIVITYAND PSYCHOEMOTIONAL WELLBEING IN THE COVID-19 PERIOD.....	98-103
Matthias Feyrer, Alexander Schuh, Holger Rupprecht, Harald Hennig, Stefan Sesselmann, Philipp Koehl. TRAUMATIC PULMONARY HERNIATION: A RARE CHEST TRAUMA MANIFESTATION.....	104-106
Sami A. Zbaar, Sawsan S. Hosi, Doaa Sabeeh Al-Nuaimi. ASSOCIATION OF NESFATIN-1 AND INSULIN RESISTANCE IN OBESE ADOLESCENTS OF IRAQI POPULATION.....	107-110
Hassan A. Saad, Mohamed E. Eraky, Ahmed K El-Tahe, Mohamed Riad, Khaled Sharaf, Azza Baz, Mohamed I. Farid, Ahmed Salah Arafa. A THOROUGH STUDY AND META-ANALYSIS OF THE PROGNOSTIC RELEVANCE OF THE C-REACTIVE-ALBUMIN RATIO IN ACUTE PANCREATITIS.....	111-118

Shoko Nishikawa, Takuma Hayashi, Tohko Uzaki, Nobuo Yaegashi, Kaoru Abiko, Ikuo Konishi. POTENTIAL LIFE PROGNOSTIC MARKER FOR MESENCHYMAL TUMOR RESEMBLING UTERINE LEIOMYOSARCOMA...	119-126
Lytvynenko M.V, Antonenko P.B, Lobashova K.G, Kashchenko O.A, Bondarenko A.V, Bondarenko O.V, Gargin V.V. PECULIARITIES OF IMMUNE STATUS IN THE PRESENCE OF SECONDARY IMMUNODEFICIENCY OF INFECTIOUS AND NON- INFECTIOUS ORIGIN IN WOMEN OF REPRODUCTIVE AGE.....	127-133
Devanshu J. Patel, Uzma Noor Shah, Nabeel Ahmad, Rajnish Garhwal, Sudhir Singh, Arvind Kumar. UNDERSTANDING THE ADAPTATION AND SENSITIVITY OF THE MICROBIOME: MICROBIAL RESILIENT AND HUMAN WELL- BEING.....	134-138
Sarkulova Zh.N, Tokshilykova A.B, Sarkulov M.N, Daniyarova K.R, Kalieva B.M, Tleuova A.S, Satenov Zh.K, Zhankulov M.H, Zhienalina R.N. FACTORS OF AGGRESSION AT THE STAGES OF OPEN SURGICAL TREATMENT OF SEVERE FORMS OF PERITONITIS.....	139-143
Anamika Tiwari, Geetika M. Patel, Nayana Borah, Amandeep Singh, Shabir Ahmad Shah, Anish Prabhakar. COVID-19 SAFETY MEASURES AND THEIR EFFECTS ON GAMBLING HABITS: AN INVESTIGATIVE STUDY.....	144-152
Mohammed.A.Alghamdi, Rajab Alzahrani, Abdullah Alghamdi, Mujtaba A.Ali, Amal M.Alghamdi, Waad M.Alghamdi, Kholoud M.Alghamdi, Shroog M Alghamdi. AWARENESS AND KNOWLEDGE OF OBSTRUCTIVE SLEEP APNEA AMONG THE POPULATION OF THE AL-BAHA REGION OF SAUDI ARABIA: A CROSS-SECTIONAL STUDY.....	153-158
Khoroshukha M, Bosenko A, Nevedomsjka J, Omeri I, Tymchyk O. INFLUENCE OF SEROLOGICAL MARKERS OF BLOOD GROUPS ON THE DEVELOPMENT OF VISUAL MEMORY FUNCTION IN YOUNG FEMALE ATHLETES AGED 13-15 YEARS.....	159-164
Kavina Ganapathy, Bhupendra Kumar, Shubham Shekhawat, Soubhagya Mishra, Rashmi Mishra, Devanshu J. Patel. EXPLORING CLINICAL VARIATIONS AND CO-MORBID TRENDS IN PD-MCI GROUPS.....	165-171
Georgi Tchernev. METASTATIC NODULAR MELANOMA DEVELOPING ON NEVUS SPILUS DURING INTAKE OF BETA BLOCKERS (BISOPROLOL/ NEBIVOLOL) AND ACE INHIBITORS (PERINDOPRIL). POTENTIAL LINKS TO THE DRUG RELATED NITROSOGENESIS/CARCINOGENESIS, DUNNING-KRUGER EFFECT AND GENETIC WEAPONS OF THE NEW GENERATION.....	172-178
Sanjeev Kumar Jain, Swarupanjali Padhi, Geetika M. Patel, Malathi.H, Bhupendra Kumar, Shweta Madaan. AN INCREASED RISK OF HORMONAL DISORDERS, PRIMARILY DIABETES, IN INDIVIDUALS WITH β -THALASSEMIA MAJOR: A RETROSPECTIVE ANALYSIS.....	179-185
Garima Jain, Komal Patel, Uzma Noor Shah, Minnu Sasi, Sanjana Sarna, Sudhir Singh. INNOVATIONS IN FOCUS: MECHANISTIC DISEASE THEORIES, CLIMATE DYNAMICS, AND HOST-PARASITE ADAPTATIONS.....	186-192
Sharadze D. Z, Abramov A. Yu, Konovalov O.E, Fomina A.V, Generalova Yu.A, Kakabadze E. M, Bokova E. A, Eliseeva T.A, Kostinskaya M.V, Smirnov D.P, Urazgulov A.K. THE INCIDENCE OF SPORTS INJURIES AMONG SCHOOL-AGED CHILDREN AND ADOLESCENTS.....	193-198
Raman Batra, Devanshu J. Patel, Asha.K, Amandeep Singh, Shivam Bhardwaj, Prerana Gupta. EXPLORING MEDICAL STUDENTS' COMPETENCY IN UNDERSTANDING PRIMARY IMMUNODEFICIENCY DISEASES IN INDIA.....	199-203
Matthias Feyrer, Stefan Sesselmann, Philipp Koehl, Alexander Schuh. AN INTRATENDINOUS GANGLION CYST OF THE PATELLAR TENDON: A RARE CAUSE OF ANTERIOR KNEE PAIN.....	204-205

AWARENESS AND KNOWLEDGE OF OBSTRUCTIVE SLEEP APNEA AMONG THE POPULATION OF THE AL-BAHA REGION OF SAUDI ARABIA: A CROSS-SECTIONAL STUDY

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Abstract.

Background: Obstructive sleep apnea (OSA) is a known sleep-disordered breathing, with known morbidity and mortality, that affects a lot of people worldwide. In Saudi Arabia, the prevalence of OSA is estimated to be around 8.8% among adult males and 5.1% among adult females.

Methods: The research is a cross-sectional study design conducted in the Al-Baha region; Saudi Arabia in 385 participants. To evaluate the knowledge and awareness of OSA, the study utilized a validated and reliable adapted Arabic version of the OSA questionnaire.

Results: The degree of consciousness and understanding regarding OSA demonstrated a noteworthy connection with varying levels of education and a favorable family history of OSAS ($p < 0.05$). The regression analyses unveiled that people with a familial OSA background had a 2.565-fold increased likelihood of identifying daytime fatigue as a symptom of OSA ($p < 0.05$).

Conclusion: The study reported an insufficient level of awareness and knowledge of OSA among the Saudi Arabian population. Various factors, including gender, education, and family history of OSA, may affect the awareness and knowledge of this condition.

Key words. Obstructive sleep apnea, OSA, Albaha, awareness, knowledge.

Introduction.

Obstructive sleep apnea (OSA) is a type of sleep disordered breathing with known morbidity ranging from snoring to overnight sudden death that affects millions of people worldwide. In Saudi Arabia, the prevalence of OSA is estimated to be around 8.8% among adult males and 5.1% among adult females [1]. Despite its high prevalence, OSA remains largely underdiagnosed and undertreated in Saudi Arabia [2]. A study conducted among the Population of the Asir Region of Saudi Arabia in 2019 showed that 81% of respondents reported that they did not know about methods of diagnosing OSA, and 84% did not know about the methods to treat OSA³, the same study reported that 46% of individuals who were suspected of having OSA had never heard of the condition before [3]. The lack of awareness and knowledge about OSA among the general population in Saudi Arabia is concerning, as it can lead to delayed diagnosis and treatment of the disorder. This

can result in a range of negative consequences, including poor sleep quality, daytime fatigue, and increased risk of accidents and medical conditions such as hypertension and diabetes [4].

In addition to the lack of awareness and knowledge about OSA among the general population, several factors contribute to the underdiagnosis and undertreatment of the disorder in Saudi Arabia. These factors include limited access to specialized sleep clinics and diagnostic tools, as well as a shortage of trained sleep medicine specialists [5]. Furthermore, there has been a growing interest in sleep medicine among healthcare professionals in Saudi Arabia, with several training programs and certification courses being offered in this field [6]. This can help to increase the number of trained sleep medicine specialists in the country, improve the quality of care provided to patients with OSA, and ultimately raise the population's knowledge and awareness of the disease.

Our study aimed to examine and assess the awareness and knowledge of OSA symptoms and complications among the population of the Al Baha Region of Saudi Arabia.

Materials and Methods.

Study design, setting, and study population:

The study design is a cross-sectional study. It was conducted in the Albaha region, Saudi Arabia. Albaha is part of the southern region of Saudi Arabia and has a population of 476,172. The sample size was calculated online according to population size, with a 95% confidence interval, and a 5% error margin; the sample size was 385. Upon collecting the data, we set inclusion and exclusion criteria to preserve the homogeneity of the data and decrease the risk of bias.

Inclusion criteria:

All participants living in the Al Baha region, both genders, and 18 years old and older.

Exclusion criteria:

Any participant with a Strong language barrier, or previously diagnosed with sleep apnea with coexisting neurological or cardiovascular disorders.

Data collection tool, and study variables:

The questionnaire used in the study is the Berlin and STOP-Bang questionnaire to assess the knowledge and awareness of

OSA, it was translated into Modern Arabic and then translated back into English. An expert review panel produced a pre-final version of the questionnaire, which was followed by a pilot test with a sample of 15 patients with OSA, the questionnaire was distributed online through social media programs. The study variables consist of personal demographics (age in categories, gender, education level, and employment status), health indicators (comorbidities, family history of OSA, being a smoker, taking medications or not, and type of medications), followed by predictors about the knowledge and awareness of OSA causes, symptoms, and complications.

Statistical analysis.

General descriptive statistics were generated. Data were described in frequencies and percentages for categorical variables. Cross-tabulation using Chi-square tests was used to examine the associations between the general demographics, and the awareness and knowledge level among the participants. Logistics regression models were utilized to yield odds ratios (ORs) and their 95% Confidence Interval (95% CI). Significance levels were set to 0.05; data analyses were done using (Statistical Package for Social Sciences) SPSS version 28.

Results.

General characteristics of the patients:

Table 1 illustrates respondent distribution across various categories including gender, education level, employment status, job type, family history of OSAS, smoking habits, chronic conditions, and medication use. Of the total respondents, 117 (22.9%) are male and 395 (77.1%) are female. Educational levels are as follows: intermediate (2%), postgraduate (5.7%), university (72.1%), secondary (19.9%), and elementary (0.4%). Employment-wise, 116 (22.7%) are employed, while 396 (77.3%) are not. Job categories include non-healthcare (15%) and healthcare (5.5%). Regarding the family history of OSAS, 26 (5.1%) have a history, while 486 (94.9%) do not. Chronic conditions affect 68 (13.3%), and 444 (86.7%) are without. Lastly, 48 (9.4%) are smokers and 464 (90.6%) are non-smokers.

Awareness & knowledge of OSA causes and symptoms:

In Table 2, respondents were asked about their views on potential causes of obstructive sleep apnea (OSA). The majority believed Obesity could be a cause, with 50.2% answering "Yes," while 45.9% were unsure, and 3.9% said "No." Snoring was considered a possible cause by 31.4% of respondents, but the majority (59.2%) were uncertain. Smoking had 41.8% affirmative responses, but over half (53.9%) were unsure. Family history and Hypothyroidism were less commonly seen as potential causes, receiving "Yes" responses from 27.3% and 20.5%, respectively. The least known potential cause was Acromegaly, with 76.2% saying they did not know if it was related to OSA.

Table 3 reveals the frequency and percentage of respondents' answers concerning symptoms associated with obstructive sleep apnea (OSA). The most commonly recognized symptoms were Suffocation Sensation (46.9% "Yes") and Nonrestorative Sleep (37.1% "Yes"). On the other hand, Weight Loss (4.5% "Yes") and Nocturia (5.9% "Yes") were the least recognized. A large percentage of respondents answered "I don't know" across all

Table 1. General characteristics of the participants.

Variables		No. (%)
Age		
More than 60	4 (0.8%)	
Less than 18	22 (4.3%)	
40-60	62 (12.1%)	
18-40	424 (82.8%)	
Gender		
Male	117 (22.9%)	
Female	395 (77.1%)	
Education level		
Intermediate	10 (2%)	
Postgraduate education	29 (5.7%)	
University education	369 (72.1%)	
Secondary	102 (19.9%)	
Elementary	2 (0.4%)	
Are you employee		
Yes	116 (22.7%)	
No	396 (77.3%)	
Type of Job		
Non-Healthcare Job	77 (15%)	
Healthcare Job	28 (5.5%)	
Do you have a family history of OSAS		
Yes	26 (5.1%)	
No	486 (94.9%)	
Are you smoker?		
Yes	48 (9.4%)	
No	464 (90.6%)	
Having Chronic disease?		
No	444 (86.7%)	
Yes	68 (13.3%)	
Medication Use		
Yes	74 (14.5%)	
No	438 (85.5%)	

Table 2. Distribution of answers to questions about causes of OSA among the population of Al-Baha.

Variables	N. (%)		
Causes of OSA	Yes	I do not know	No
Obesity	257 (50.2%)	235 (45.9%)	20 (3.9%)
Snoring	161 (31.4%)	303 (59.2%)	48 (9.4%)
Smoking	214 (41.8%)	276 (53.9%)	22 (4.3%)
Family History	140 (27.3%)	293 (57.2%)	79 (15.4%)
Hypothyroidism	105 (20.5%)	372 (72.7%)	35 (6.8%)
Acromegaly	78 (15.2%)	390 (76.2%)	44 (8.6%)

symptoms, ranging from 49% for Suffocation Sensation to 70.9% for Nocturia. The percentage of "No" responses varied but was generally low, except for Deep Sleep and Weight Loss, where the "No" responses were 28.3% and 26.6%, respectively.

Awareness & knowledge of OSA complications:

Table 4 displays respondents' survey responses on obstructive sleep apnea (OSA) complications. For Stroke: 122 (23.8%) Yes, 357 (69.7%) Not sure, 33 (6.4%) No. Cardiac Arrest: 121 (23.6%) Yes, 355 (69.3%) Not sure, 36 (7%) No. Dementia: 51 (10%) Yes, 374 (73%) Not sure, 87 (17%) No. Road Accident:

Table 3. Distribution of answers to questions about symptoms of OSA among the population of Al-Baha.

Variables	N. (%)		
	Yes	I do not know	No
Symptoms of OSA			
Snoring	175 (34.2%)	299 (58.4%)	38 (7.4%)
Day-Time Fatigue	123 (24%)	316 (61.7%)	73 (14.3%)
Day-Time Somnolence	79 (15.4%)	336 (65.6%)	97 (18.9%)
Nonrestorative Sleep	190 (37.1%)	276 (53.9%)	46 (9%)
Concentration Disorder	106 (20.7%)	341 (66.6%)	65 (12.7%)
Morning Headache	125 (24.4%)	341 (66.6%)	46 (9%)
Nocturia	30 (5.9%)	363 (70.9%)	119 (23.2%)
Suffocation Sensation	240 (46.9%)	251 (49%)	21 (4.1%)
Deep Sleep (Distractor)	49 (9.6%)	318 (62.1%)	145 (28.3%)
Weight Loss (Distractor)	23 (4.5%)	353 (68.9%)	136 (26.6%)

Table 4. Distribution of answers to questions about complications of OSA among the population of Al-Baha.

Variables	N. (%)		
	Yes	I do not know	No
Complications of OSA			
Stroke	122 (23.8%)	357 (69.7%)	33 (6.4%)
Arrest	121 (23.6%)	355 (69.3%)	36 (7%)
Dementia	51 (10%)	374 (73%)	87 (17%)
Road Accident	90 (17.6%)	333 (65%)	89 (17.4%)
Asthma (Distractor)	87 (17%)	360 (70.3%)	65 (12.7%)

Table 5. Association between education level and knowledge about OSA symptoms among the population of Albaha.

Symptom	Education Level					X (p-value)
	Elementary	Intermediate	Secondary	University	Postgraduate	
Day-time fatigue						
Yes	1 (50)	0 (0)	22 (21.6)	95 (25.7)	5 (17.2)	17.834 (0.011)*
I do not know	1 (50)	10 (100)	59 (57.8)	222 (60.2)	24 (82.8)	
No	0 (0)	0 (0)	21 (20.6)	52 (14.1)	0 (0)	
Day-time somnolence						
Yes	0 (0)	0 (0)	12 (11.8)	65 (17.6)	2 (6.9)	15.869 (0.025)*
I do not know	2 (100)	10 (100)	62 (60.8)	237 (64.2)	25 (86.2)	
No	0 (0)	0 (0)	28 (27.5)	67 (18.2)	2 (6.9)	
Suffocation sensation						
Yes	0 (0)	4 (40)	40 (39.2)	183 (49.6)	13 (44.8)	13.166 (0.08)*
I do not know	2 (100)	6 (60)	52 (51)	175 (47.4)	16 (55.2)	
No	0 (0)	0 (0)	10 (9.8)	11 (3)	0 (0)	

Table 6. Association between family history of OSA and knowledge about OSA symptoms among the population of Albaha.

Symptom	Family history of OSA		X (p-value)
	Yes	No	
Obesity			
Yes	16 (61.5)	241 (49.6)	6.647 (0.037)
I do not know	7 (26.9)	228 (46.9)	
No	3 (11.5)	17 (3.5)	
Smoking			
Yes	16 (61.5)	159 (32.7)	8.151 (0.012)
I do not know	9 (34.6)	290 (59.7)	
No	1 (3.8)	37 (7.6)	

Table 7. Association between family history of OSA and knowledge about OSA symptoms among the population of Albaha.

Symptom	Family history of OSA		X (p-value)
	Yes	No	
Snoring			
Yes	18 (69.2)	143 (29.4)	16.349 (<.001)
I do not know	8 (30.8)	295 (60.7)	
No	0 (0)	48 (9.9)	
Day-time fatigue			
Yes	14 (53.8)	109 (22.4)	13.785 (<.001)
I do not know	12 (46.2)	304 (62.6)	
No	0 (0)	73 (15)	
Day-time somnolence			
Yes	4 (15.4)	75 (15.4)	6.435 (0.037)
I do not know	12 (46.2)	324 (66.7)	
No	10 (38.5)	87 (17.9)	
Concentration Disorder			
Yes	4 (15.4)	102 (21)	6.645 (0.032)
I do not know	14 (53.8)	327 (67.3)	
No	8 (30.8)	57 (11.7)	
Nocturia			
Yes	3 (11.5)	27 (5.6)	6.201 (0.037)
I do not know	13 (50)	350 (72)	
No	10 (38.5)	109 (22.4)	
Suffocation sensation			
Yes	19 (73.1)	221 (45.5)	7.918 (0.015)
I do not know	6 (23.1)	245 (50.4)	
No	1 (3.8)	20 (4.1)	

Table 8. Logistic regression analysis of knowledge of OSA symptoms and the presence of OSA-positive family history among the population of Albaha.

Variable	B	Sig.	aOR	95% C.I.	
				Lower	Upper
Day-time fatigue is a symptom of OSA	.942	.043	2.565	1.029	6.391

90 (17.6%) Yes, 333 (65%) Not sure, 89 (17.4%) No. Asthma (Distractor): 87 (17%) Yes, 360 (70.3%) Not sure, 65 (12.7%) No.

Awareness & knowledge of OSA and its associations with different variables:

Table 5 presents data on the association between education levels and knowledge of Obstructive Sleep Apnea (OSA) symptoms in the population of Albaha. For the symptom of daytime fatigue, awareness increases with education level, peaking at 25.7% "Yes" responses among university-level respondents. Day-time somnolence shows a similar but less pronounced trend, with university attendees again most knowledgeable at 17.6%. For the sensation of suffocation, higher educational levels also correspond to greater awareness, peaking at nearly 50% among university-level individuals. Across all education levels, a significant number of respondents were "Not sure" about symptoms, especially in the lower education categories. The p-values for these associations are 0.011, 0.025, and 0.08, indicating statistical significance in all cases.

Table 6 shows the Association between a family history of OSA and knowledge about OSA symptoms among the population of Albaha. For a positive family history of OSA,

Obesity represented 16 (61.5%) yes, 7 (26.9) I do not know, and 3 (11.5%) no. For a negative family history of OSA, Obesity represented 241 (49.6%) yes, 228 (46.9%) I do not know, and 17 (3.5%) No (p<0.05). For a positive family history of OSA, smoking represented 16 (61.5%), 9 (34.6%) I do not know, and 1 (3.8%) No. For a negative family history of OSA, smoking represented 159 (32.7%) yes, 290 (59.7) I do not know, 37 (7.6) No (p<0.05).

Table 7 shows the Association between family history of OSA and knowledge about OSA symptoms among the population of Albaha, for positive history of OSA. Among those with a positive family history of OSA, higher percentages were aware of symptoms such as snoring (69.2%) and suffocation sensation (73.1%) compared to those with a negative family history (29.4% for snoring, 45.5% for suffocation sensation). Other symptoms like day-time fatigue, day-time somnolence, concentration disorder, and nocturia also showed varying levels of awareness, but consistently, those with a positive family history seemed more knowledgeable. These differences were statistically significant with p-values below 0.05.

Table 8 shows the logistic regression results, which indicate that individuals with a family history of OSA were 2.565 times more likely to recognize daytime fatigue as an OSA symptom.

Discussion.

This study was conducted to assess the awareness and knowledge of obstructive sleep apnea among the population of the Al Baha region of Saudi Arabia, as well as assess the knowledge about symptoms and complications of obstructive sleep apnea among the population of Al-Baha region of Saudi Arabia. Since Obstructive sleep apnea (OSA) is a prevalent sleep disorder that affects millions of people worldwide, Saudi Arabia is not exempted. A review article reported that the disease is also common in Saudi Arabia, with a prevalence rate of around 8.8% in adult males and 5.1% in adult females. Despite that, the general population's awareness, and knowledge of OSA in Saudi Arabia remain low, This was reported in a previous study which demonstrated that the number of respondents who were able to properly state the causes, symptoms, and complications of OSA which were relatively low-field [8]. This is in line with Our study since the majority of respondents do not know whether snoring, hypothyroidism, and acromegaly as leading causes of OSA. Additionally, many respondents don't know that daytime fatigue, daytime somnolence, Morning Headache, and Nocturia are known symptoms of OSA. Moreover, most of the respondents aren't familiar with stroke, arrest, dementia, and road accidents are known complications of OSA.

The level of awareness and knowledge of OSA in the general population in Saudi Arabia appears to be influenced by several factors, including gender, education, and family history of OSA. Studies have shown that males have a higher prevalence of OSA than females [9], and this may contribute to greater awareness of the condition among males Building upon the impact of gender on awareness levels, another study revealed that among females who were conscious of OSA, there was an increased tendency to actively seek medical assistance for their symptoms [10].

In the current study, Education appears to be a factor that influences awareness and knowledge of OSA in the general population in Saudi Arabia. Consistent with our finding, a previous study found that individuals with higher levels of education were more likely to have heard of OSA and its symptoms and risk factors [11]. This suggests that educational programs and campaigns may be effective in increasing awareness and knowledge of OSA in the general population.

In this study, Family history of OSA may play a role in the level of awareness and knowledge of the symptoms in Saudi Arabia. Agreeing with this, in a previous study, Individuals with a family history of OSA may be more likely to be aware of the condition and its associated risks and symptoms [12]. This highlights the importance of family history in identifying individuals at risk of OSA and promoting awareness of the condition among family members.

The low level of awareness and knowledge of OSA in the general population in Saudi Arabia may have significant implications for public health. Without adequate awareness of the condition's symptoms and risk factors, individuals may be less likely to seek medical attention for their symptoms, leading to undiagnosed and untreated OSA, which can have serious consequences.

OSA has been associated with a range of health problems, including cardiovascular disease, diabetes, stroke, and

depression [13]. The prevalence of these conditions is also high in Saudi Arabia, with rates of hypertension, diabetes, and obesity all above the global [14]. Given the high prevalence of OSA and its associated health risks in Saudi Arabia, increasing awareness and knowledge of the condition is crucial for improving public health outcomes.

Furthermore, untreated OSA can have a significant impact on individuals' quality of life, including impaired daytime functioning, decreased productivity, and reduced quality of life [15]. These consequences can have a broader impact on the economy and society as a whole, highlighting the importance of addressing the low level of awareness and knowledge of OSA in Saudi Arabia.

Efforts to increase awareness and knowledge of OSA in the general population in Saudi Arabia should be tailored to the unique cultural and social context of the country.

Additionally, targeting individuals at high risk of OSA, such as those with obesity or a family history of the condition, may help to increase awareness and promote early detection and treatment. Finally, public health campaigns or educational programs on the magnitude of OSA targeting the Al-Baha population is crucial to address the disease and preventing complication.

Limitations.

The limitations of our study it was restricted to the population of the Al-Baha region of Saudi Arabia. Thus, it is not representative of populations in other regions of the country, especially remote rural areas. A broader national survey would be needed to test the generalizability of our results.

Added to that, this was a cross-sectional survey of self-reported knowledge of the population who may underestimate their knowledge in an area. Moreover, this complex disorder is difficult to fully address with a single study that relies primarily on self-reporting measures. However, since there is very little research exploring Awareness and knowledge of obstructive sleep apnea among the population of the Al-Baha Region of Saudi Arabia our chosen methodological approach is a necessary and reasonable place to start.

Conclusion.

In conclusion, the low level of awareness and knowledge of OSA in the general population in Saudi Arabia is a significant public health concern. Factors such as gender, education, and family history of OSA may influence awareness and knowledge of the condition.

Recommendations.

There is a need for increased awareness and education about OSA among the general population in Saudi Arabia. Healthcare providers should play a crucial role in raising awareness about the condition and its associated risks. Public health campaigns and educational and training programs can also help to improve knowledge and understanding of OSA among the general population [7]. To address these issues, efforts are being made to increase the availability of sleep clinics and diagnostic tools in Saudi Arabia. For example, in recent years, several new sleep centers have been established throughout the country, and portable sleep monitoring devices have been introduced to facilitate the diagnosis and treatment of OSA in remote areas.

Overall, while there is still a long way to go in terms of raising awareness and improving the diagnosis and treatment of OSA in Saudi Arabia, there is hope that these efforts will lead to better outcomes for patients with this common sleep disorder.

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Authors' Contributions.

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Introduction: Amal M. Alghamdi, Waad M. Alghamdi, Kholoud M. Alghamdi, Shroog M. Alghamdi.

Methodology and Results: Dr. Abdullah Alghamdi 3, Dr Mujtaba A.Ali

Discussion and conclusion: Dr. Mohammed.A.Alghamdi, Dr. Rajab Alzahrani

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Availability of Data and Material.

Data can be obtained from the corresponding author on a reasonable request.

Declarations.

The authors declare that there are no conflicts of interest.

Ethical Approval.

All the methods in this study were done by the Saudi guidelines and regulations. Informed consent was obtained from all subjects and/or their legal guardian(s). The study was approved by the Medical Ethics Committee of Albaha University, Faculty of Medicine research committee (Ethical approval code :(REC/SUR/BU-FM/2022/26R).

Consent for publications.

Not applicable.

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