Turkish Journal of Pediatric Disease / *Türkiye Çocuk Hastalıkları Dergisi*

ANKARA BİLKENT ŞEHİR HASTANESİ ÇOCUK HASTANESİ

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Turkish Journal of Pediatic Disease
Türkiye Çocuk Hastalıkları Dergisi

ANKARA BİLKENT ŞEHİR HASTANESİ
ÇOCUK HASTANESİ

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Turkish Journal of Pediatric Disease has been a member of the DOI® system since March 2013.
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Türkiye Çocuk Hastalıkları Dergisi TÜBİTAK/ULAKBİM Türk Tıp Dizini, EBSCOhost Research Databases, ve Türkiye Atıf Dizini tarafından indekslenmektedir.

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22 PAP

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Bu dergi geri dönüştürülebilir, imha etmek istediğinizde lütfen geri dönüşüm kutularına atınız.

AIMS and SCOPE / AMAÇ ve KAPSAM

The Turkish Journal of Pediatric Disease is an open access and a scientific publication journal of the Ankara Bilkent City Hospital, Children's Hospital. The journal is published in accordance with independent, unbiased, and double-blind peer review principles. The journal is published bimonthly (January, March, May, July, September, November).

In the Turkish Journal of Pediatric Disease original articles, reviews, case reports, editorials, short reports, book reviews, biographies and letters to the editor are also published in the journal. Besides if related with pediatrics, articles on aspects of pedatric surgery, dentistry, public health, genetics, pshyciatrics and nursery could be published. The publication language of Turkish Journal of Pediatric Disease is English.

Manuscripts submitted to the Turkish Journal of Pediatric Disease will go through a double-blind peer-review process. Each submission will be reviewed by at least two external, independent peer reviewers who are experts in the field, in order to ensure an unbiased evaluation process. The editorial board will invite an external and independent editor to manage the evaluation processes of manuscripts submitted by editors or by the editorial board members of the journal. The Editor in Chief is the final authority in the decision-making process for all submissions.

The Turkish Journal of Pediatric Disease is indexed in Turkish Medical Index of TÜBİTAK / ULAKBİM, EBSCOhost Research Databases and Türkiye Citation Index.

Journal is published on acid free paper.

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Türkiye Çocuk Hastalıkları Dergisi, Ankara Bilkent Şehir Hastanesi Çocuk Hastanesi'nin açık erişimli bilimsel yayındır. Dergi bağımsız, tarafsız ve çift-kör hakemlik ilkelerine uygun olarak yayınlanır. Dergi iki ayda bir yayınlanmaktadır (Ocak Mart, Mayıs, Temmuz, Eylül, Kasım).

Türkiye Çocuk Hastalıkları Dergisi'nde orijinal makale, derleme, olgu sunumu, editöryal, çalışma yöntemi, kısa rapor, kitap incelemeleri, biyografiler ve editöre mektup yayınlanmaktadır. Ayrıca pediatri ile ilgili konulardaki genetik, pediatrik cerrahi, diş hekimliği, halk sağlığı, çocuk ve ergen psikiyatrisi ve hemşirelik makaleleri değerlendirmeye alınır. Türkiye Çocuk Hastalıkları Dergisi'nin yayın dili İngilizcedir.

Türkiye Çocuk Hastalıkları Dergisi'ne gönderilen yazılar çift kör hakemlik sürecinden geçecektir. Her bir yazı tarafsız bir değerlendirme süreci sağlamak için alanda uzman en az iki harici, bağımsız hakem tarafından incelenecektir. Baş editör, tüm başvurular için karar alma sürecindeki nihai otoritedir.

Türkiye Çocuk Sağlığı ve Hastalıkları Dergisi TÜBİTAK/ULAKBİM Türk Tıp Dizini, EBSCOhost Research Databases ve Türkiye Atıf Dizini tarafından indekslenmektedir.

Dergimiz asitsiz kâğıda basılmaktadır.

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Yazarların Bilimsel ve Hukuki Sorumluluğu

Yazarlar Türkiye Çocuk Hastalıkları Dergisi'ne bir yazı gönderirken, yazıların telif haklarını Türkiye Çocuk Hastalıkları Dergisi'ne devretmiş olmayı kabul ederler. Yayınlanmamak üzere reddedilirse veya herhangi bir sebepten yazı geri çekilirse telif hakkı yazarlara geri verilir. Türk Türkiye Çocuk Hastalıkları Dergisi'ne ait Telif Hakkı Devri ve Yazarlık Formları (https://dergipark.org.tr/tr/pub/tchd adresinden indirilebilir). Şekiller, tablolar veya diğer basılı materyaller de dahil olmak üzere basılı ve elektronik formatta daha önce yayınlanmış içerik kullanılıyorsa yazarlar telif hakları sahiplerinden gerekli izinleri almalıdır. Bu konudaki hukuki, finansal ve cezai yükümlülükler yazarlara aittir.

INSTRUCTIONS FOR AUTHORS

The Turkish Journal of Pediatric Disease is an open access and a scientific publication journal that is published from the Ankara Bilkent City Hospital, Children's Hospital. The journal is published in accordance with independent, unbiased, and double-blind peer review principles. The journal is published bimonthly (January, March, May, July, September, November)

The journal publishes original articles, reviews, case reports, short reports, editorials, book reviews, biographies and letters to the editor. Additionally, articles on topics related to pediatrics, including aspects of pediatric surgery, dentistry, public health, genetics, psychiatry and nursery, may be considered for publication. The publication language of the Turkish Journal of Pediatric Disease is English.

The editorial and the publication processes of the journal are shaped in accordance with the guidelines of the World Association of Medical Editors (WAME), the Committee on Publication Ethics (COPE), the International Council of Medical Journal Editors (ICMJE), the Council of Science Editors (CSE), the European Association of Science Editors (EASE) and National Information Standards Organization (NISO). The journal conforms to the Principles of Transparency and Best Practice in Scholarly Publishing (doaj.org/bestpractice).

The originality, high scientific quality, and the citation potential are the most important criterias for a manuscript to be accepted for the publication. Manuscripts submitted for the evaluation should not have been previously presented or already published in an electronic or printed medium. The journal should be informed if manuscript have been submitted to another journal for the evaluation and have been rejected for the publication. The submission of previous reviewer reports will expedite the evaluation process. Manuscripts that have been presented in a meeting should be submitted with a detailed information of the organization, including the name, date, and location of the organization.

Manuscripts submitted to the Turkish Journal of Pediatric Disease will go through a double-blind peer-review process. Each submission will be reviewed by at least two external, independent peer reviewers who are experts in the field, in order to ensure an unbiased evaluation process. The editorial board will invite an external and independent editor to manage the evaluation processes of manuscripts submitted by editors or by the editorial board members of the journal. The Editor in Chief is the final authority in the decision-making process for all submissions. Articles accepted for publication in the Turkish Journal of Pediatrics are put in the order of publication, with at least 10 articles in each issue, taking into account the acceptance dates. If the articles sent to the reviewers for evaluation are assessed as a senior for publication by the reviewers, the section editor and the editor considering all aspects (originality, high scientific quality and citation potential), it receives publication priority in addition to the articles assigned for the next issue.

An approval of the research protocols by the Ethics Committee in accordance with international agreements (World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects," amended in October 2013, www.wma.net) is required for the experimental, clinical, and drug studies and for some case reports. If required, ethics committee reports or an equivalent official document will be requested from the authors. For manuscripts that are concerning experimental researchs on humans, a statement should be informed included that shows a written informed consent of the patients and the volunteers who were given a detailed explanation of the procedures that they may undergo. For studies carried out on animals, the measures taken to prevent pain and suffering of the animals should be stated clearly. Information of the patient consent, the name of the ethics committee, and the ethics committee approval number should also be stated in the Materials and Methods section of the manuscript. It is the authors' responsibility to carefully protect the patients' anonymity carefully. For the photographs that may reveal the identities of the patients, releases signed by the patient or their legal representative should be enclosed.

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The Turkish Journal of Pediatric Disease requires and encourages the authors and the individuals who involved in the evaluation process of submitted manuscripts to disclose any existing or potential conflicts of interests, including financial, consultant, and institutional, that might lead to the potential bias or a conflict of interest. Any financial grants or other supports received for the submitted study from individuals or institutions should be disclosed to the Editorial Board. To disclose a potential conflict of interest, the ICMJE Potential Conflict of Interest Disclosure Form should be filled in and submitted by all of the contributing authors. Cases of the potential conflict of interest of the editors, authors, or reviewers are being resolved by the journal's Editorial Board within the scope of COPE and ICMJE guidelines.

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The manuscripts should be prepared in accordance with the ICMJE-Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals (Updated January 2024 - http://www.icmje.org/recommendations).

CONSORT	Randomised controlled trials
STROBE	Observational epidemiological research
STARD	Diagnostic accuracy
PRISMA	Systematic reviews and meta-analysis
ARRIVE	Experimental animal studies
TREND	Non-randomized public behavior

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Manuscripts submitted to the journal will go firstly through a technical evaluation process where the editorial office staff will ensure that the manuscript has been prepared and submitted in accordance with the journal's guidelines. Submissions not conforming to the journal's guidelines will be returned to the submitting author with the technical correction requests.

Authors are required to submit the following:

Copyright Transfer and Acknowledgement of Authorship Form and

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Manuscripts should be written using Microsoft Word™ (2010 and higher) software, in Times New Roman, 12 point size and double line spacing. There should be 2 cm margins on all sides on the pages. "System International" (SI) units should be used in manuscripts. Tables and graphics should be cited in the text. Abbreviations can be used provided that they are written openly at the first place they appear in the abstract and text, and the abbreviation is given in parentheses.

In the article, when giving the mean and percentile, 2 digits should be used after the decimal point (such as 231.69 or 231.70, instead of 231.7). In the representations other than integers, two digits should be written after the dot, and in the representation of statistical values (such as p, r, t, z values), three digits should be written after the dot. In the presentation of p values, instead of $p<0.05$ or $p>0.05$, the full p value should be given with three digits after the dot (eg $p=0.029$) with the test statistic. If this value is less than one thousandth, it should be displayed as $p<0.001$.

Preparation of the Manuscript Title page:

Title page should be submitted for all of the submissions and this page should include:

Title page of the manuscript should include the English title of the article. The title page should include the authors' names, degrees, ORCID number and the institutional/professional affiliations, a short title (max 50 character), abbreviations, financial disclosure statement, and the conflict of interest statement. For manuscripts sent by the authors in Türkiye, a title in Turkish is also required. If a manuscript includes authors from more than one institution, each author's name should be followed by a superscript number that corresponds to this/her institution, which is listed separately. Please provide a contact information for the corresponding author, including name, e-mail address, and telephone and fax numbers.

Important Notice: The title page should be submitted separately.

Keywords: Each submission must be accompanied by a minimum of three to a maximum of six keywords for subject indexing at the end of the abstract. The keywords should be listed in full without abbreviations. The keywords should be selected from the National Library of Medicine, Medical Subject Headings database (https://www.nlm.nih.gov/mesh/MBrowser.html). For manuscripts sent by the authors in Türkiye, key words in Turkish are also required.

MANUSCRIPT TYPES

Original Articles:

Word count: up to 3,500 (Introduction, Methods, Results, Discussion)

Title: maximum of 20 words

Structured abstract: up to 250 (Objective, Materials and Methods, Results and Conclusion)

Keywords: 3-6 word, listed in alphabetical order.

Figures and tables: are not limited, but must be justified thoroughly

References: It should be at least 20 and at most 40.

It is required that original articles include an English title, an English structured abstract and English keywords. Additionally, the Turkish title, Turkish structured summary and Turkish keywords are required. It is widely acknowledged that the abstract is of critical importance to the majority of readers, as it is the first section they will read. Furthermore, a significant number of electronic databases only integrate abstracts into their index, which emphasises the importance of including key findings in the abstract. The remaining sections of the manuscript should include the following: Introduction, Materials and Methods, Results, Discussion, Conclusion, Acknowledgement (if required) and References. All sections of the manuscript should start on a new page.

Review Articles:

Word count: up to 5000

Abstract: up to 500 (Objective, Materials and Methods, Results and Conclusion)

Keywords: 3-6 word, listed in alphabetical order.

Figures and tables: are not limited, but must be justified thoroughly

References: up to 80

Review articles are comprehensive analyses of the specific topics in medicine, which are written upon the invitation due to extensive experience and publications of authors on the review subjects. All invited review articles will also undergo peer review prior to the acceptance.

Review articles should include; English title, English abstract and English key words. For manuscripts sent by authors in Türkiye, a Turkish title, Turkish abstract and Turkish key words are also required.

Case Reports:

Word count: up to 2000

Abstract: up to 200

Keywords: 3-6 word, listed in alphabetical order.

Figures and tables: total 5

References: up to 15

There is a limited space for the case reports in the journal and reports on rare cases or conditions that constitute challenges in the diagnosis and the treatment, those offering new therapies or revealing knowledge that are not included in the literature, and interesting and educative case reports are being/ will be accepted for publication. The text should include Introduction, Case Presentation and Discussion.

Case reports should include; English title, English abstract and English key words. For manuscripts sent by authors in Türkiye, a Turkish title, Turkish abstract and Turkish key words are also required.

Letters to the Editor:

Word count: up to 1500

Figures and tables: total 3

References: up to 15

This type of manuscript discusses about the important parts, overlooked aspects, or lacking parts of the previously published article. Articles on subjects within the scope of the journal that might attract the readers' attention, particularly educative cases, may also be submitted in the form of a Letter to the Editor. Readers can also present their comments on published manuscripts in the form of a Letter to the Editor. An abstract and Keywords should not be included. Tables, Figures, Images, and other media can be included. The text should not include subheadings. The manuscript that is being commented on, must be properly cited in this manuscript.

Letters to the Editor should include; English title. For the letter to the editor sent by authors in Türkiye, a Turkish title also required.

Study Protocols:

The Turkish Journal of Pediatric Disease welcomes study protocols to improve the transparency of research and inform the scholarly community about the trials that are being underway. Publication decision of study protocols will be by editorial decision. Study protocols for the pilot or feasibility studies are not generally taken into consideration.

Study protocol articles should follow the SPIRIT guidelines that provides a detailed account of the hypothesis, rationale, and methodology of the study. All study protocols must provide an Ethics Committee Approval. All protocols for the clinical trials require a trial registration number and the date of registration.

Tables

Tables should be included in the main document, presenting after the reference list, and they should be numbered consecutively in the order they are referred in the main text. A descriptive title must be placed above the tables. Abbreviations used in the tables should be defined below the tables by the footnotes (even if they were defined within the main text). Data presented in the tables should not be a repetition of the data presented within the main text but should be supporting the main text. The following symbols should be used for abbreviations in sequence: *, †, ‡, §, ||, ¶, **, ††, ‡‡.

Figures and Figure Legends

Figures, graphics, and photographs should be submitted as separate files (in TIFF or JPEG format) through the submission system. The files should not be embedded in a Word document or in the main document. When there are figure subunits, the subunits should not be merged to form a single image. Each subunit should be submitted separately through the submission system. Images should not be labeled (a, b, c, etc.) to indicate figure subunits. Thick and thin arrows, arrowheads, stars, asterisks, and similar marks can be used on the images to support figure legends. Like the rest of the submission, the figures should also be blind. Any information within the images that may indicate an individual or an institution should be blinded. The minimum resolution of each submitted figure should be 300 DPI. To prevent delays in the evaluation process, all submitted figures should be clear in resolution and large size (minimum dimensions: 100 × 100 mm). Figure legends should be listed at the end of the main document.

All acronyms and abbreviations used in the manuscript should be defined at first use, both in the abstract and in the main text The abbreviation should be provided in parentheses following the definition.

When a drug, product, hardware, or software program is mentioned within the main text, product information, including the name of the product, the producer of the product, and city and the country of the company (including the state if in USA), should be provided in parentheses as in the following format: The skin prick tests were performed using a multi-prick test device (Quantitest, Panatrex Inc, Placentia, California, USA).

All references, tables, and figures should be referred in the main text, and they should be numbered consecutively in the order that they are referred in the main text.

Limitations, drawbacks, and the shortcomings of original articles should be mentioned in the Discussion section before the conclusion paragraph.

REFERENCES

While citing publications, the preference should be given to the latest, most up-to-date publications. Authors should avoid using references that are older than ten years. The limit for the old reference usage is 20% in the journal. If an ahead-of-print publication is cited, the DOI number should be provided. Authors are responsible for the accuracy of the references. Reference numbers should be indicated at the end of the sentences in parentheses and references should be numbered consecutively in the order that they are mentioned in the text. Journal names should be abbreviated as listed in "Index Medicus" or in "ULAKBIM/Turkish Medical Index". References should be typed in consistence with the following examples. Native references should be used as much as possible.

If the reference is a journal;

Author(s)' surname and initial(s) of the first name (all authors if the number of authors are 6 or less, first 6 authors if the number of authors of an article is more than 6 followed by "ve ark." in Turkish references and "et al." in international references). Title of the article, title of the manuscript abbreviated according to Index Medicus

(http://www.ncbi.nlm.nih.gov/sites/entrez/query.fcgi?db=nlmcatalog). Year;Volume:First and last page number.

Example: Benson M, Reinholdt J, Cardell LO. Allergen-reactive antibodies are found in nasal fluids from patients with birch polen-induced intermittent allergic rhinitis, but not in healthy controls. Allergy 2003;58:386-93.

If the reference is a journal supplement;

Author(s)' surname and initial(s) of the first name. Title of the article. Title of the manuscript abbreviated according to Index Medicus (http://www.ncbi.nlm.nih.gov/sites/entrez/query. fcgi?db =nlmcatalog). Year;Volume (Suppl. Supplement number): First and last page number.

Example: Queen F. Risk assessment of nickel carcinogenicity and occupational lung cancer. Envirol Health Perspect 1994;102 (Suppl. 1):S2755-S2782.

If the reference is a book;

Author(s)' surname and initial(s) of the first name. Title of the book. Edition number. City of publication; Publisher, Year of Publication.

Example: Ringsven MK, Bond N. Gerontology and leadership skills for nurses. 2nd ed. Albany, NY: Delmar Publishers, 1996.

If the reference is a book chapter;

Surname and initial(s) of the first name of the author(s) of the chapter. Title of the chapter. In: Surname and initial(s) of the first name(s) of the editor(s) (ed) or (eds). Title of the book. Edition number. City of

publication: Publisher, Year of publication: First and last page numbers of the chapter.

Example: Phillips SJ, Whistant JP. Hypertension and stroke. In: Laragh JH, Brenner BM (eds). Hypertension: Pathophysiology, Diagnosis and Management. 2nd ed. New York: Raven P, 1995:466-78.

If the reference is a conference paper presented in a meeting;

Author(s)' surname and initial(s) of the first name (all authors if the number of authors are 6 or less, first 6 authors if the number of authors of a conference paper is more than 6 followed by "et al.". Title of the conference paper, If applicable In: Surname and initial(s) of the first name(s) of the editor(s) (ed) or (eds). Title of the abstract book. Title of the meeting; Date; City of the meeting; Country. Publisher; Year: Page numbers.

Example: Bengtsson S, Solheim BG. Enforcement of data protection, privacy and security in medical informatics. In: Lun KC, Degoulet P, Piemme TE, Reinhoff O (eds). MEDINFO 92. Proceedings of the 7th World Congress on Medical Informatics; 1992 Sep 6-10; Geneva, Switzerland. North-Holland; 1992: 1561-5.

If the reference is an online journal:

Author(s)' surname and initial(s) of the first name (all authors if the number of authors are 6 or less, first 6 authors if the number of authors of an article is more than 6 followed by "ve ark." in Turkish references and "et al." in international references).Title of the article, title of the manuscript abbreviated according to Index Medicus Year; Volume (Number). Available from:URL address. Accessed date:day.month. year.

Example: Arrami M, Garner H. A tale of two citations. Nature 2008;451(7177): 397-9. Available from: URL:www.nature.com/nature/journal/v451/n7177/full/451397a.html. Accessed 20 January 2008.

If the reference is a website:

Name of the web site. Access date. Available from: address of the web site.

Example: Centers for Disease Control and Prevention (CDC). Acsess date: 12 March 2013. Available from: http://www.cdc.gov/

If the reference is a thesis:

Author's surname and initial of the first name. Title of the thesis (thesis). City; Name of the university (if it is a university); Year.

Example: Özdemir O. Fibrillin-1 gene polymorhism and risk of mitral valve disorders. (Thesis). *Ankara*: Gazi University, 2006.

REVISIONS

When submitting a revised version of a paper, the author must submit a detailed "Response to the reviewers" that states point by point how each issue were raised by the reviewers, and where it can be found (each reviewer's comment, followed by the author's reply and line numbers where the changes have been made) as well as an annotated copy of the main document. Revised manuscripts must be submitted within 30 days from the date of the decision letter. If the revised version of the manuscript is not submitted within the allocated time, the revision option may be cancelled. If the submitting author(s) believe that additional time is required, they should request this extension before the initial 30-day period is over.

Accepted manuscripts are copy-edited for the grammar, the punctuation, and the format. Once the publication process of a manuscript is completed, it will be published online on the journal's webpage as an ahead-of-print publication before being included in it's scheduled issue. A PDF proof of the accepted manuscript will be sent to the corresponding author and their publication approval will be requested within 2 days of their receipt of the proof.

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In a case where a manuscript has taken more than six months' time for the review process, that this allows the author for withdrawing the manuscript.

YAZARLAR İÇİN BİLGİ

Türkiye Çocuk Hastalıkları Dergisi, Ankara Şehir Hastanesi Çocuk Hastanesi'nin açık erişimli bilimsel yayındır. Dergi bağımsız, tarafsız ve çift-kör hakemlik ilkelerine uygun olarak yayınlanır. Dergi iki ayda bir yayınlanmaktadır (Ocak Mart, Mayıs, Temmuz, Eylül, Kasım)

Türkiye Çocuk Hastalıkları Dergisi'nde orijinal makale, derleme, olgu sunumu, editöryal, çalışma yöntemi, kısa rapor, kitap incelemeleri, biyografiler ve editöre mektup yayınlanmaktadır. Ayrıca pedatrik cerrahi, diş hekimliği, halk sağlığı, genetik, çocuk ve ergen psikiyatrisi ve hemşirelik konularında makaleler yayınlanabilir. Türkiye Çocuk Hastalıkları Dergisi'nin yayın dili İngilizcedir.

Derginin yayın ve yayın süreçleri, Dünya Tıbbi Editörler Derneği (World Association of Medical Editors (WAME)), Yayın Etiği Komitesi (Committee on Publication Ethics (COPE)), Uluslararası Tıbbi Dergi Editörleri Konseyi (International Council of Medical Journal Editors (ICMJE)), Bilim Editörleri Konseyi (Council of Science Editors (CSE)), Avrupa Bilim Editörleri Birliği (EASE) ve Ulusal Bilgi Standartları Organizasyonu (National Information Standards Organization (NISO) (NISO)) kurallarına uygun olarak şekillendirilmiştir. Dergi, Bilimsel Yayıncılıkta Şeffaflık ve En İyi Uygulama İlkeleri'ne (Principles of Transparency and Best Practice in Scholarly Publishing (doaj.org/bestpractice)) uygundur.

Yazıların yayına kabulü için en önemli kriterler özgünlük, yüksek bilimsel kalite ve atıf potansiyelidir. Değerlendirme için gönderilen yazılar daha önce elektronik veya basılı bir ortamda yayınlanmamış olmalıdır. Dergi, değerlendirilmek üzere başka bir dergiye gönderilen ve reddedilen yazılar hakkında bilgilendirilmelidir. Önceki inceleme raporlarının sunulması değerlendirme sürecini hızlandıracaktır. Kongre ve toplantılarda sunulan yazılarda yazının sunulduğu toplantının kongrenin adı, tarihi ve yeri de dahil olmak üzere ayrıntılı bilgi ile birlikte sunulmalıdır.

Türkiye Çocuk Hastalıkları Dergisi'ne gönderilen yazılar çift kör hakemlik sürecinden geçecektir. Her bir yazı tarafsız bir değerlendirme süreci sağlamak için alanda uzman en az iki harici, bağımsız hakem tarafından incelenecektir. Baş editör, tüm başvurular için karar alma sürecindeki nihai otoritedir. Türkiye Çocuk Hastalıkları Dergisinde yayınlanmak üzere kabul edilmiş makaleler kabul tarihleri dikkate alınarak her sayıda en az 10 makale olacak şekilde yayın sırasına alınır. Değerlendirilmek üzere hakemlere gönderilen makaleler tüm yönleri (özgünlük, yüksek bilimsel kalite ve atıf potansiyeli) dikkate alınarak hakemler, alan editörü ve editör tarafından öncelikli olarak yayınlanmaya aday bir makale olarak değerlendirilir ise bir sonraki sayıda o sayı için atanmış makalelere ek olarak yayınlanma önceliği alır.

Yazarlardan deneysel, klinik ve ilaç çalışmaları ve bazı vaka raporları için gerekirse, etik kurul raporları veya eşdeğer bir resmi belge istenecektir. İnsanlar üzerinde yapılan deneysel araştırmalarla ilgili yazılar için, hasta ve gönüllülerin yazılı bilgilendirilmiş olurlarının alınabileceği prosedürlerin ayrıntılı bir açıklamasının ardından elde edildiğini gösteren bir ifade eklenmelidir. Hayvanlar üzerinde yapılan çalışmalarda, hayvanların acı ve ıstıraplarını önlemek için alınan önlemler açıkça belirtilmelidir. Hasta onamı, etik komite adı ve etik komite onay numarası hakkında bilgi de makalenin Materyal-Metod bölümünde belirtilmelidir. Hastaların anonimliklerini dikkatlice korumak yazarların sorumluluğundadır. Hastaların kimliğini ortaya çıkarabilecek fotoğraflar için, hasta veya yasal temsilcisi tarafından imzalanan bültenler eklenmelidir.

Tüm makale başvurularında DergiPark ile intihal.net ile arasında yapılan işbirliği uyarınca intihal açısından benzerlik raporu istenecektir. Makale gönderim adımlarında yazarlar bilgilendirlecek ve dosya yükleme adımında sistem tarafından rapor hazırlanarak sonuç e-posta ile yazara bildirlecektir. Rapor açıklandığında yazar gönderim işlemini tamamlayabilecektir. Türkiye Çocuk Hastalıkları Dergisi'ne makale gönderebilmek için benzerlik oranı en fazla %20 olmalıdır.

İntihal, atıf manipülasyonu ve gerçek olmayan verilerden şüphelenilmesi veya araştırmaların kötüye kullanılması durumunda, yayın kurulu COPE yönergelerine uygun olarak hareket eder.

Yazar olarak listelenen her bireyin Uluslararası Tıp Dergisi Editörleri Komitesi (ICMJE - www.icmje.org) tarafından önerilen yazarlık kriterlerini karşılaması gerekir. ICMJE yazarlığın aşağıdaki 4 kritere dayanmasını önerir:

1. Çalışmanın tasarımı, verilerin elde edilmesi, analizi veya yorumlanması

2. Dergiye gönderilecek kopyanın hazırlanması veya bu kopyayının içeriğini bilimsel olarak etkileyecek ve ileriye götürecek şekilde katkı sağlanması

3. Yayınlanacak kopyanın son onayı.

4. Çalışmanın tüm bölümleri hakkında bilgi sahibi olma ve tüm bölümleri hakkında sorumluluğu alma

Bir yazar, yaptığı çalışmanın bölümlerinden sorumlu olmanın yanı sıra, çalışmanın diğer belirli bölümlerinden hangi ortak yazarların sorumlu olduğunu bilmeli ayrıca yazarlar, ortak yazarlarının katkılarının bütünlüğüne güvenmelidir.

Yazar olarak atananların tümü yazarlık için dört kriteri de karşılamalı ve dört kriteri karşılayanlar yazar olarak tanımlanmalıdır. Dört kriterin tümünü karşılamayanlara makalenin başlık sayfasında teşekkür edilmelidir.

Yazı gönderim aşamasında ilgili yazarların, yazarlık katkı formunun imzalı ve taranmış bir versiyonunu (https://dergipark.org.tr/en/pub/tchd adresinden indirilebilir) Türkiye Çocuk Hastalıkları Dergisi'ne göndermesini gerektirir. Yayın kurulu yazarlık şartarını karşılamayan bir kişinin yazar olarak eklendiğinden şüphe ederse yazı daha fazla incelenmeksizin reddedilecektir. Makalenin gönderilmesi aşamasında bir yazar makalenin gönderilmesi ve gözden geçirilmesi aşamalarında tüm sorumluluğu üstlenmeyi kabul ettiğini bildiren kısa bir açıklama göndermelidir.

Türkiye Çocuk Hastalıkları Dergisi'ne gönderilen bir çalışma için bireylerden veya kurumlardan alınan mali hibeler veya diğer destekler Yayın Kuruluna bildirilmelidir. Potansiyel bir çıkar çatışmasını bildirmek için, ICMJE Potansiyel Çıkar Çatışması Bildirim Formu, katkıda bulunan tüm yazarlar tarafından imzalanmalı ve gönderilmelidir. Editörlerin, yazarların veya hakemlerin çıkar çatışması olasılığı, derginin Yayın Kurulu tarafından COPE ve ICMJE yönergeleri kapsamında çözümlenecektir.

Derginin Yayın Kurulu, tüm itiraz durumlarını COPE kılavuzları kapsamında ele almaktadır. Bu gibi durumlarda, yazarların itirazları ile ilgili olarak yazı işleri bürosu ile doğrudan temasa geçmeleri gerekmektedir. Gerektiğinde, dergi içinde çözülemeyen olayları çözmek için bir kamu denetçisi atanabilir. Baş editör itiraz durumlarında karar alma sürecinde alınacak kararlarla ilgili nihai otoritedir.

Yazarlar Türkiye Çocuk Hastalıkları Dergisi'ne bir yazı gönderirken, yazıların telif haklarını Türkiye Çocuk Hastalıkları Dergisi'ne devretmiş olmayı kabul ederler. Yayınlanmamak üzere reddedilirse veya herhangi bir sebepten yazı geri çekilirse telif hakkı yazarlara geri verilir. Türk Türkiye Çocuk Hastalıkları Dergisi'ne ait Telif Hakkı Devri ve Yazarlık Formları (https://dergipark.org.tr/tr/pub/tchd adresinden indirilebilir). Şekiller, tablolar veya diğer basılı materyaller de dahil olmak üzere basılı ve elektronik formatta daha önce yayınlanmış içerik kullanılıyorsa yazarlar telif hakları sahiplerinden gerekli izinleri almalıdır. Bu konudaki hukuki, finansal ve cezai yükümlülükler yazarlara aittir.

Yazıların sonuçlarının rapor edilemesi sırasında genellikle istatistiksel analizler gereklidir. İstatistiksel analizler uluslararası istatistik raporlama standartlarına uygun olarak yapılmalıdır (Altman DG, Gore SM, Gardner MJ, Pocock SJ. Tıp dergilerine katkıda bulunanlar için istatistiksel yönergeler. Br Med J 1983: 7; 1489-93). İstatistiksel analizler hakkında bilgi, Materyal ve Metot bölümünde ayrı bir alt başlık ile açıklanmalı ve bu süreçte kullanılan istatistiksel yazılımlar mutlaka belirtilmelidir.

Türkiye Çocuk Hastalıkları Dergisi'nde yayınlanan yazılarda belitilen ifade veya görüşler, editörlerin, yayın kurulunun veya yayıncının görüşlerini yansıtmaz; editörler, yayın kurulu ve yayıncı bu tür materyaller için herhangi bir sorumluluk veya yükümlülük kabul etmez. Yayınlanan içerikle ilgili nihai sorumluluk yazarlara aittir.

YAZININ HAZIRLANMASI

Yazılar, Tıbbi Çalışmalarda Bilimsel Çalışmanın Yürütülmesi, Raporlanması, Düzenlenmesi ve Yayınlanması için Uluslararası Tıbbi Dergi Editörleri Konseyi (International Council of Medical Journal Editors (ICMJE)) Önerileri'ne uygun olarak hazırlanmalıdır (Aralık 2019'da güncellenmiştir - http://www.icmje.org/icmje-recommendations). Bu liste aşağıda görülebilir.

CONSORT	Randominize kontrollü çalışma
STROBE	Gözlemsel epidemiyolojik çalışmalar
STARD	Tanı yöntemleri
PRISMA	Sistemetik derleme ve metaanaliz
ARRIVE	Deneysel hayvan çalışmaları
TREND	Randomize olmayan tutum ve davranış çalışmaları

Yazılar yalnızca derginin çevrimiçi (online) makale gönderme ve değerlendirme sistemi aracılığıyla gönderilebilir.

https://dergipark.org.tr/tr/journal/2846/submission/step/manuscript/new Başka herhangi bir araç aracılığıyla gönderilen yazılar değerlendirmeye alınmayacaktır.

Dergiye gönderilen yazılar öncelikle sekreterlik tarafından yazının

derginin kurallarına uygun olarak hazırlanıp hazırlanmadığı yönünden teknik bir değerlendirme sürecinden geçecektir. Derginin yazım kurallarına uymayan yazılar, düzeltme talepleriyle birlikte gönderen yazara iade edilecektir.

Yazarların yazıları hazırlarken ve sisteme yüklerken aşağıdaki konulara dikkat etmesi gerekmektedir:

Telif Hakkı Devri ve Yazarlık Formunun Kabulü ve ICMJE tyarafından önerilen Potansiyel Çıkar Çatışması Bildirim Formu İlk başvuru sırasında (katkıda bulunan tüm yazarlar tarafından doldurulmalıdır) sisteme yüklenmelidir. Bu formları www.dergipark.org.tr/tr/pub/tchd adresinden indirebilirsiniz.

Yazılar, Microsoft Word™ (2010 ve üstü) yazılım programı kullanılarak, Times New Roman karakterinde, 12 punto büyüklüğünde ve çift satır aralığı ile yazılmalıdır. Sayfalarda her yönden 2 cm boşluk bırakılmalıdır. Yazılarda "System International" (SI) birimleri kullanılmalıdır. Tablo ve grafiklere metin içinde atıf yapılmalıdır. Kısaltmalar öz ve metinde ilk geçtikleri yerde açık yazılıp, parantez içinde kısaltma verilmek kaydıyla kullanılabilirler.

Makale içinde, ortalama ve yüzdelik verilirken, ondalıklı hanelerin gösteriminde noktadan sonra 2 basamak kullanılması gerekmektedir (231.7 yerine; 231.69 veya 231.70 gibi). Tam sayı dışındaki gösterimlerde noktadan sonra iki hane, istatistiksel değerlerin gösteriminde ise (p, r, t, z değerleri gibi) noktadan sonra üç hane yazılması gerekir. p değerlerinin sunumunda $p<0.05$ veya $p>0.05$ yerine test istatistiği ile birlikte tam p değerinin noktadan sonra üç hane içerek şekilde verilmesi (ör: $p=0.029$) gerekmektedir. Bu değerin binde birden küçük olması durumunda $p<0.001$ şeklinde gösterim yapılmalıdır.

Kapak sayfasının hazırlanması:

Kapak sayfası tüm yazılarla birlikte gönderilmeli ve bu sayfa şunları içermelidir:

Yazının kapak sayfasında yazının İngilizce başlığı bulunmalıdır. Kapak sayfası yazarların adlarını, akademik ünvanlarının, ORCID numaralarını, kurumsal/mesleki bağlantılarını, yazının kısa başlığını (en fazla 50 karakter), kısaltmaları, finansal açıklama bildirimini ve çıkar çatışması bildirimini içermelidir. Yazı Türkiye'de bulunan bir merkez tarafından gönderilmişse yazılar için Türkçe bir başlık da gereklidir. Bir yazı birden fazla kurumdan yazar içeriyorsa, her yazarın adını, ayrı olarak listelenen kurumlarına karşılık gelen bir üst simge numarası izlemelidir. Tüm yazarlar için için isim soy isim, e-posta adresi, telefon ve faks numaraları dahili iletişim bilgileri verilmelidir. Ayrıca yazı ile ilgili olrak iletişim kurulacak sorumlu sorumlu yazarın kim olduğu belirtilmelidir.

Önemli Uyarı: Kapak sayfası ayrı bir belge olarak yüklenmelidir.

Anahtar kelimeler:
Özetin sonunda konu indeksleme için her gönderime en az üç en fazla altı anahtar kelime eklenmelidir. Anahtar kelimeler kısaltma olmadan tam olarak listelenmelidir. Anahtar kelimeler "National Library of Medicine, Medical Subject Headings database (https://www.nlm.nih.gov/mesh/MBrowser.html)" veritabanından seçilmelidir. Yazı Türkiye'de bulunan bir merkez tarafından gönderilmişse Türkçe anahtar kelimeler de gereklidir.

Yazı türleri:

Orijinal araştırma makalesi

Kelime sayısı: En çok 3500 kelime (Başlık, özet, anahtar kelimeler, kaynaklar, tablo ve figür yazıları hariç).

Ana metnin içereceği bölümler: Giriş, Yöntemler, Sonuçlar, Tartışma

Başlık: En çok 20 kelime

Yapısal özet: En çok 250 kelime. Bölümler: Amaç, Gereç ve Yöntem, Sonuçlar ve Tartışma

Anahtar kelimeler: En az 3 en fazla altı kelime, alfabetik olarak sıralanmıştır.

Şekiller ve tablolar: Sayı sınırı yok ancak tam olarak gerekçelendirilmeli ve açıklayıcı olmalıdır.

Referanslar: En az 20, en çok 40 olmalıdır.

Özgün makalelerin İngilizce başlık, İngilizce yapılandırılmış özet ve İngilizce anahtar kelimeler içermesi gerekmektedir. Ayrıca, Türkçe başlık, Türkçe yapılandırılmış özet ve Türkçe anahtar kelimeler de gereklidir. Özetin, okuyucuların çoğunluğu için, okuyacakları ilk bölüm olması nedeniyle kritik öneme sahip olduğu yaygın olarak kabul edilmektedir.

Ayrıca, elektronik veri tabanlarının önemli bir kısmı sadece özetleri indekslerine dahil etmektedir, bu da özette temel bulguların yer almasının önemini vurgulamaktadır. Makalenin geri kalan bölümleri aşağıdakileri içermelidir: Giriş, Materyal ve Yöntemler, Bulgular, Tartışma, Sonuç, Teşekkür (gerekiyorsa) ve Kaynaklar. Makalenin tüm bölümleri yeni bir sayfada başlamalıdır.

Derleme:

Kelime sayısı: En fazla 5000

Özet: En fazla 500 kelime

Anahtar kelimeler: En az üç en fazla altı kelime, alfabetik olarak sıralanmıştır.

Şekiller ve tablolar: Sayı sınır yok ancak tam olarak gerekçelendirilmeli ve açıklayıcı olmalıdır.

Referanslar: 80'e kadar

Derleme makaleleri, tıptaki belirli konuların kapsamlı olarak gözden geçirildiği, konunun tarihsel gelişimini, mevcut bilinenleri, araştırıma ihtiyacı olan alanları içeren yazılarır. Konu hakkında orijinal araştırmaları yazarlar tarafından yazılmalıdır. Tüm derleme yazıları kabulden önce diğer yazılara eşdeğer değerlendirme süreçlerine tabi tutulacaktır.

Derleme makaleleri şunları içermelidir; İngilizce başlık, İngilizce özet ve İngilizce anahtar kelimeler. Derleme Türkiye'de bulunan bir merkez tarafından gönderilmişse Türkçe başlık, Türkçe özet ve Türkçe anahtar kelimeler de gerekmektedir.

Olgu Sunumu:

Kelime Sayısı: En fazla 2000 kelime

Özet: En fazla 200 kelime

Anahtar Kelime: En az üç en fazla altı kelime

Tablo ve Şekil: Toplamda en fazla beş ile sınırlandırılmıştır.

Referans: En fazla 15

Dergiye sınırlı sayıda olgu sunumu kabul edilmektedir. Olgu sunumlarının tanı ve tedavide zorluk oluşturan, nadir, literatürde yer almayan yeni tedaviler sunan ilginç ve eğitici olguların seçilmesine dikkat edilmektedir. Olgu sunumu giriş, olgu sunumu ve tartışma içermelidir.

Olgu sunumları şunları içermelidir; İngilizce başlık, İngilizce özet ve İngilizce anahtar kelimeler. Türkiye'de bulunan bir merkez tarafından gönderilmişse Türkçe başlık, Türkçe özet ve Türkçe anahtar kelimeler de gereklidir.

Editöre mektup:

Kelime sayısı: En fazla 1500 kelime

Şekil ve tablolar: En fazla 3

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Tablolar, referans listeden sonra ana belgeye dahil edilmelidir ana metin içine yerleştirilmemelidir. Ana metinde atıfta bulundukları sırayla numaralandırılmalıdır. Tabloların üzerine açıklayıcı bir başlık konulmalıdır. Tablolarda kullanılan kısaltmalar ana metinde tanımlansalar bile tabloların altında dipnotlarla tanımlanmalıdır. Tablolarda sunulan veriler, ana metinde sunulan verilerin tekrarı olmamalı, ancak ana metni desteklemelidir. Kısaltmalar için aşağıdaki semboller sırayla kullanılmalıdır: *, †, ‡, §, ||, ¶, **, ††, ‡‡.

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Makalede kullanılan tüm kısaltmalar ve akronimler, hem özet hem de ana metinde ilk kullanımda tanımlanmalıdır. Kısaltma, tanımın ardından parantez içinde verilmelidir.

Ana metinde bir ilaç, ürün, donanım veya yazılım programından bahsedildiğinde, ürünün adı, ürünün üreticisi ve şehri ve şirketin ülkesini (ABD'de ise eyalet dahil) içeren ürün bilgileri, parantez içinde aşağıdaki biçimde sağlanmalıdır: The skin prick tests were performed using a multi-prick test device (Quantitest, Panatrex Inc, Placentia, California, USA)

Tüm referanslar, tablolar ve şekiller ana metin içinde belirtilmeli ve ana metin içinde belirtildikleri sırayla numaralandırılmalıdır. Orijinal makalelerin kısıtlılıkları tartışma bölümü içinde sonuç paragrafından önce belirtilmelidir.

KAYNAKLAR

Yayınlara atıf yapılırken, en son ve en güncel yayınlar tercih edilmelidir. Yazarlar on yıldan eski referansları kullanmaktan kaçınmalıdır. Yazılarda 10 yıldan eski tarihli referans sayısının toplam referans sayısının %20'sini geçmemesine dikkat edilmelidir. Elektronik olarak yayınlanmış ancak cilt ve sayfa numarası verilmemiş yazılar atfedilirken DOI numarası verilmelidir. Yazarlar kaynakların doğruluğundan sorumludur. Referans numaraları metindeki cümlelerin sonunda parantez içinde metinde kullanıldıkları sıra ile numaralandırılmalıdır. Dergi adları "Index Medicus" veya "ULAKBIM/ Turkish Medical Index" de listelendiği gibi kısaltılmalıdır. Mümkün olduğunca yerel referanslar kullanılmalıdır. Kaynaklar aşağıdaki örneklere uygun olarak yazılmalıdır.

Kaynak dergi ise;

Yazar(lar)ın soyadı adının başharf(ler)i (6 ve daha az sayıda yazar için yazarların tümü, 6'nın üzerinde yazarı bulunan makaleler için ilk 6 yazar belirtilmeli, Türkçe kaynaklar için "ve ark.", yabancı kaynaklar için "et al." ibaresi) kullanılmalıdır. Makalenin başlığı. Derginin Index Medicus'a uygun kısaltılmış ismi

(http://www.ncbi.nlm.nih.gov/sites/entrez/query.fcgi?db=nlmcatalog) Yıl;Cilt:İlk ve son sayfa numarası.

Örnek: Benson M, Reinholdt J, Cardell LO. Allergen-reactive antibodies are found in nasal fluids from patients with birch polen-induced intermittent allergic rhinitis, but not in healthy controls. Allergy 2003;58:386-93.

Kaynak dergi eki ise;

Yazar(lar)ın soyadı adının başharf(ler)i. Makalenin başlığı. Derginin Index Medicus'a uygun kısaltılmış ismi (http://www.ncbi.nlm.nih.gov/sites/entrez/query.fcgi?db=nlmcatalog) Yıl;Cilt

(Suppl. Ek sayısı):İlk sayfa numarası-Son sayfa numarası.

Örnek: Shen HM, Zhang QF. Risk assessment of nickel carcinogenicity and occupational lung cancer. Environ Health Perspect 1994; (102 Suppl 1):275–82.

Kaynak kitap ise;

Yazar(lar)ın soyadı, adının başharf(ler)i. Kitabın adı. Kaçıncı baskı olduğu. Basım yeri: Basımevi, Basım Yılı.

Örnek: Ringsven MK, Bond N. Gerontology and leadership skills for nurses. 2nd ed. Albany, NY: Delmar Publishers, 1996.

Kaynak kitaptan bölüm ise;

Bölüm yazar(lar)ının soyadı adının başharf(ler)i. Bölüm başlığı. In: Editör(ler)in soyadı, adının başharf(ler)i (ed) veya (eds). Kitabın adı. Kaçıncı baskı olduğu. Basım yeri: Yayınevi,

Baskı yılı:Bölümün ilk ve son sayfa numarası.

Örnek: Phillips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM (eds). Hypertension: Pathophysiology, Diagnosis, and Management. 2nd ed. New York: Raven P, 1995:466–78.

Kaynak toplantıda sunulan bildiri ise;

Yazar(lar)ın soyadı adının başharf(ler)i. (6 ve daha az sayıda yazar için yazarların tümü, 6'nın üzerinde yazarı bulunan bildiriler için ilk 6 yazar belirtilmeli, Türkçe kaynaklar için "ve ark.", yabancı kaynaklar için "et al." ibaresi kullanılmalıdır). Bildirinin başlığı. Varsa In: Editör(ler)in soyadı adının başharf(ler)i (ed) veya (eds). Kitabın adı. Toplantının adı; Tarihi; Toplantının yapıldığı şehrin adı, Toplantının yapıldığı ülkenin adı. Yayınevi; Yıl. Sayfa numaraları.

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Kaynak elektronik dergi ise;

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Örnek: Arrami M, Garner H. A tale of two citations. Nature 2008;451(7177): 397-9. Available from: URL:www.nature.com/nature/journal/v451/n7177/full/451397a.html. Accessed 20 January 2008.

Kaynak web sitesi ise:

Web sitesinin adı. Erişim tarihi. Available from: Web sitesinin adresi.

Örnek: Centers for Disease Control and Prevention (CDC). Erişim tarihi: 12 Mart 2013.

Available from: http://www.cdc.gov/

Kaynak tez ise:

Yazarın soyadı adının baş harfi. Tezin başlığı (tez). Tezin yapıldığı şehir adı: Üniversite adı (üniversite ise); Yılı.

Örnek: Özdemir O. Fibrillin-1 gen polimorfizmi ve mitral kapak hastalığı riski. (Tez). Ankara: Gazi Üniversitesi, 2006."

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Yazının geri çekilmesi talebi

Türkiye Çocuk Hastalıkları Dergisi yüksek kaliteli yazılar yayınlamayı ve yayın etiğini korumayı taahhüt etmektedir. Yazarlardan, yayın etiğinde ve yazıların kalitesinde tavsiye edilen kurallara uymaları beklenmektedir.

Yazının geri çekilme talebi olağanüstü durumlarda talep edilmelidir. Bir yazının geri çekilmesi için yazarların dergiye geri çekme nedenlerini belirten ve tüm yazarlar tarafından imzalanan bir "Makale geri çekme Formu" yüklemeleri gerekmektedir. Bu form derginin web sayfasından indirilebilir. Yazarlar dergiden bu konuda olumlu bir cevap alana kadar makalelerinin geri çekilme işleminin tamamlanmadığını bilmelidir.

Bir makalenin inceleme süreci altı aydan uzun bir zaman almış ve yazarlara karar bildirilmemişse yazının geri çekilme talebi olumlu karşılanır.

CONTENTS / İÇİNDEKİLER

Original Articles / *Özgün Araştırmalar*

Comparison Between Cardio-Electrophysiological Balance Index and Corrected Values in Different Age Groups Among School-Age Children

Okul Çağındaki Çocuklarda Farklı Yaş Gruplarında Kardiyo-Elektrofizyolojik Denge İndeksi ve Düzeltilmiş Değerlerinin Karşılaştırılması

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ABSTRACT

Objective: The index of cardio-electrophysiological balance (iCEB) is a new non-invasive marker that can be used to predict malignant ventricular arrhythmias. Pediatric studies on iCEB are limited in number. Our study aimed to determine the range of its values in different age groups among school-age children.

Material and Methods: The study included patients aged 5-17 admitted to Gülhane Training and Research Hospital Pediatric Cardiology Outpatient Clinic between March 2020 and March 2022 without a history of chronic disease, cardiac disease, arrhythmia, or cardiac surgery. Participants were categorised into ages 5-8, 9-12, and 13-17. The iCEB and iCEBc values were calculated and compared between groups.

0000-0001-7121-3810 : GÜNEŞ Ö
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Ethics Committee Approval / *Etik Kurul Onayı*: This study was conducted in accordance with the Helsinki Declaration Principles. the study was obtained from the Gülhane Training and Research Hospital Ethics Committee (2020-91).

Contribution of the Authors / Yazarların katkısı*: *GÜNEŞ Ö: Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Organizing, supervising the course of progress and taking responsibility for the research/study, Taking responsibility in patient follow-up, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***GÜNEY AY:*** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Organizing, supervising the course of progress and taking responsibility for the research/study, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***HALİL H:*** Organizing, supervising the course of progress and taking responsibility for the research/study, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***KAYALI AKYOL A:*** Taking responsibility in patient follow-up, data management and reporting, execution of the experiments, Taking responsibility in necessary literature review for the study, Reviewing the article before submission scientifically besides spelling and grammar. ***AKYOL Ö:*** Taking responsibility in patient follow-up, data management and reporting, execution of the experiments, Taking responsibility in necessary literature review for the study, Reviewing the article before submission scientifically besides spelling and grammar. ***ÜÇKARDEŞ F:*** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Taking responsibility in patient follow-up, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***ÖZTELCAN GÜNDÜZ B:*** Taking responsibility in necessary literature review for the study, Reviewing the article before submission scientifically besides spelling and grammar. ***AYDOĞMUŞ YH:*** Taking responsibility in necessary literature review for the study, Reviewing the article before submission scientifically besides spelling and grammar. ***PAMUK U:*** Constructing the hypothesis or idea of research and/or article, Taking responsibility in patient follow-up, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***KILIÇ A:*** Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***ÜNAY B:*** Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar.

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Results: The total number of 1303 cases were categorised into the 5-8 (n=270), 9-12 (n=389), and 13-17 (n=644) age groups. The mean iCEB and iCEBc values for all age groups were 4.39±0.53 and 5.16±0.53, respectively. Any difference was not detected among age groups of 5-8, 9-12, and 13-17 years in terms of iCEB and iCEBc values (4.42±0.56, 4.39±0.53 and 4.39±0.52 vs. 5.19±0.56, 5.15±0.55 and 5.16±0.52, respectively). However, a significant difference was found between male (n=699) and female (n=604) patients in terms of mean iCEB (4.23±0.52 vs. 4.59±0.47) and iCEBc (4.98±0.53 vs. 5.38±0.46) values (p <0.001).

Conclusion: iCEB and iCEBc values in school-age children did not differ according to age groups. However, these values differed between boys and girls. This study is the first to reveal normal ranges of iCEB and iCEBc values in school-age children.

Key Words: Child, ECG, iCEB, iCEBc, School-age

ÖZ

Amaç: Kardiyo-elektrofizyolojik denge indeksi (iCEB), malign ventriküler aritmileri tahmin etmede kullanılabilecek yeni, invazif olmayan bir belirteçtir. iCEB ile ilgili pediatrik çalışmalar sayıca sınırlıdır. Çalışmamız okul çağındaki çocuklarda farklı yaş gruplarındaki iCEB değerlerinin aralığını belirlemeyi amaçladı.

Gereç ve Yöntemler: Gülhane Eğitim ve Araştırma Hastanesi Çocuk Kardiyoloji Polikliniğine Mart 2020-Mart 2022 tarihleri arasında başvuran, kronik hastalık, kalp hastalığı, aritmi ve kalp cerrahisi öyküsü olmayan 5-17 yaş arası hastalar çalışmaya dahil edildi. Katılımcılar 5-8, 9-12 ve 13-17 yaş gruplarına ayrıldı. iCEB ve iCEBc değerleri hesaplandı ve gruplar arasında karşılaştırıldı.

Bulgular: Toplam 1303 vaka 5-8 (n=270), 9-12 (n=389) ve 13-17 (n=644) yaş gruplarına ayrıldı. Tüm yaş grupları için ortalama iCEB ve iCEBc değerleri sırasıyla 4.39±0.53 ve 5.16±0.53'di. iCEB ve iCEBc değerleri açısından 5-8, 9-12 ve 13-17 yaş grupları arasında farklılık saptanmadı (4.42±0.56, 4,.39±0.53 ve 4.39±0.52 vs. 5.19±0.56, 5.15±0.55 ve 5.16±0.52). Ancak erkek (n=699) ve kadın (n=604) hastalar arasında ortalama iCEB (4.23±0.52 vs. 4.59±0.47) ve iCEBc (4.98±0.53 vs. 5.38±0.46) değerleri açısından anlamlı fark bulundu (p <0.001).

Sonuç: Okul çağındaki çocuklarda iCEB ve iCEBc değerleri yaş gruplarına göre farklılık göstermedi. Ancak bu değerler kız ve erkek çocuklar arasında farklılık göstermektedir. Bu çalışma, okul çağındaki çocuklarda iCEB ve iCEBc değerlerinin normal aralıklarını ortaya koyan ilk çalışmadır.

Anahtar Sözcükler: Çocuk, EKG, iCEB, iCEBc, Okul çağı

INTRODUCTION

A new, simple, effective, easily calculable and non-invasive marker called the cardio-electrophysiological balance index (iCEB), which can be obtained by dividing the QT duration by the QRS duration (QT/QRS) and used in predicting malignant ventricular arrhythmias was first introduced to the literature by Lu et al. (1). The iCEB balances ventricular depolarization (QRS) and repolarisation (QT). It has been considered equivalent to the wavelength of the cardiac impulse, namely the cardiac wavelength. This cardiac wavelength increases significantly in predicting polymorphic ventricular tachycardia (torsades de pointes). At the same time, a decrease in it is crucial in predicting non-polymorphic ventricular tachycardia and fibrillation. In addition, it is a non-invasive marker and can be measured simply on surface ECG. Adult studies have been conducted on using iCEB and iCEBc values in various diseases. Among these diseases, COVID-19, end-stage renal disease, sarcoidosis, type 1 diabetes mellitus, tinnitus, subarachnoid haemorrhage, type myotonic dystrophy can be enumerated (2-9). However, studies revealing the ranges of average iCEB values in the pediatric age group are limited. Our study aimed to determine the typical ranges of iCEB and iCEBc values in school-age children using ECG. Records will be made according to the age groups and gender of the study participants.

MATERIALS and METHODS

Patients aged 5-17 years who applied to the pediatric outpatient clinics of Gülhane Training and Research Hospital between March 2020 and March 2022 for nonspecific chest pain, cardiac murmurs and health control were referred to the Pediatric Cardiology Outpatient Clinic for ECG. Monitoring was included in this prospective cross-sectional study. Patients who did not have congenital or acquired heart disease, any chronic disease, arrhythmia or cardiovascular surgery history, whose parents gave informed consent and whose echocardiographic examinations were performed were included in the study. Anthropometric (weight and height) measurements and arterial blood pressure measurements of the cases were performed. Those with height and weight values below the 3rd percentile and above the 97th percentile and those with body mass index and arterial blood pressure measurements below the 5th percentile and above the 95th percentile were excluded from the study (10,11). Cases of obesity, malnutrition, systemic hypertension and other systemic diseases were excluded from the study. Those with congenital or acquired heart disease after echocardiographic evaluation and those with arrhythmia after 24-hour Holter ECG evaluation were excluded from the study. Participants were categorised into ages 5-8, 9-12 and 13-17 years (12).

Electrocardiography recordings (25 mm/sec, 10 mV) were obtained with a 12-lead ECG device (G.E. Healthcare M.A.C.

2000, Milwaukee, U.S.A.) and analysed manually by two experienced paediatricians. Intra-reader variability was <2 ms for all intervals and <0.10 mV for all amplitudes. Inter-reader variability was a maximum of +/–5 ms for intervals including the QT and a maximum of 0.15 mV for the amplitudes, including the R waves. Heart rate, PR interval, QRS axis, QRS duration, and QT interval values were obtained from ECGs obtained independently from the derivations. On the lead DII, arithmetic means of three consecutive beats were taken to obtain PR interval duration and heart rate per minute. QRS, QT and QTc measurements used in these ratios were obtained from precordial leads using arithmetic means of three consecutive beats. The time from the beginning of the QRS complex to the end of the T wave was considered the QT interval. Bazzett formula was used for QTc calculations, and iCEB and iCEBc ratios were determined as follows: QTc = QT/√RR) QT/QRS (iCEB) and QTc/ QRS (corrected iCEB; iCEBc). In addition, the QRS, QT and QTc measurements used in calculating these ratios were obtained by taking the arithmetic average of three consecutive beats in precordial leads. The iCEB and iCEBc values were compared between age groups and genders.

Statistical analysis

Statistical analyses were performed using the IBM Statistical Package for the Social Sciences, version 25.0 (SPSS Inc., Armonk, NY, IBM Corp., USA). The conformity of quantitative variables with normal distribution was evaluated with the single-sample Kolmogorov- Smirnov test. Independent two-sample t-test was used to determine the difference between genders. ANOVA test was used to check the difference (if any) between age groups. The results were given as mean±standard deviation (mean±SD) and also minimuma and maximum values. Pearson correlation analysis was performed to determine the correlation of iCEB and iCEBc measurements (if any) with age groups. Simple linear regression analysis was used to investigate whether iCEB and iCEBc measurements were age-independent. The level of statistical significance was accepted as p<0.050.

Written informed consent was obtained from the parents of all children, as well as from the children aged 12-17 years. Approval for the study was obtained from the Gülhane Training and Research Hospital Ethics Committee (2020-91).

RESULTS

The study population consisted of 699 male and 604 female patients. Male and female study participants were included in the age groups of 5-8 (n= 270; 140 boys and 130 girls), 9-12 (n= 389; 194 boys, 195 girls) and 13-17 (n= 644; 365 boys, and 279 girls) years. The average weight was 23.82±3.53 kg for ages 5-8, 35.25±5.89 kg for ages 9-12, and 55.98±7.65 kg for ages 13-18. The average height was 120.56±4.76 cm for ages 5-8, 140.42±5.86 cm for ages 9-12, and 163.77±5.56 cm for ages 13-18. The average body mass index was 15.74±2.44 for ages 5-8, 17.62±2.37 for ages 9-12, and 20.78±2.47 for ages 13-18. Mean arterial blood pressure values were 98.95±6.74/60.25±7.45 mmHg for ages 5-8, 107.07±5.28/68.27±6.35 mmHg for ages 9-12, 114.35±6.38/73.78±6 for ages 13-18. Heart rates, QRS, QT, QTc and PR interval values are given according to age groups in Table I and the age groups and gender of the cases in Table II. The QRS intervals were shorter in the same age group, while QT and QTc intervals were more extended in female subjects.

The mean iCEB and iCEBc values for all age groups were 4.39±0.53 and 5.16±0.54, respectively. There was no difference between age groups regarding iCEB p=0.567) and iCEBc values (p=0.199). The iCEB and iCEBc values by age groups are summarised in Table III.

However, a significant difference was found between iCEB and iCEBc values between male and female genders in the same age group (p <0.001). The mean iCEB and iCEBc values of the male (n= 699) and female (n= 604) participants were 4.23±0.52 vs. 4.59±0.47 and 4.98±0.53 vs. 5.38±0.46, respectively (Table IV). As a result of the correlation analysis, no significant correlation was found between the iCEB and iCEBc values and the age of the participants (r=-0.003, p=0.908; r=-0.006, p=0.818, respectively). Increasing or decreasing age did not increase or decrease iCEB and iCEBc values. As a result of the regression analysis, both iCEB and iCEBc values were independent of age (β=-0.0005, p=0.908, β=-0.001, p=0.818). Increasing or decreasing age did not affect iCEB and iCEBc values. Percentiles of iCEB and iCEBc values of the study participants according to age groups and gender are given in Table V.

DISCUSSION

The studies conducted since the first definitions of iCEB/iCEBc values have focused on adult cases with pathological increases and decreases of these values because of diseases and drugs carrying an increased risk of arrhythmia (1). Limited relevant studies have been conducted on pediatric age groups and healthy subjects. Therefore, the findings in our study had to be compared with the reference ranges of iCEB and iCEBc values reported in studies performed in the healthy control groups.

First, in the literature, Sap et al. (13) aimed to examine ICEB and other risk markers regarding cardiac arrhythmia in children with acute rheumatic carditis. In their study, the mean ages of the patient and control groups, each consisting of 16 female and 24 male participants, had been 11.40±3.48 and 11.41±3.31 years, respectively. The iCEBc values were significantly higher in the group with acute rheumatic carditis. In contrast, relative increases in iCEB values in the patient group were not

Table I: ECG parameters by age groups

Age groups	Heart rate (bpm)*	QRS interval (msec*)	QT interval (msec)*	QTc interval (msec)*	PR interval (msec)*
5-8 years (n=270)	85.5±14.6	80.2±7.7	351.1±26.4	412.4±18.5	122.1±15.0
9-12 years (n=389)	86.3±13.2	81.1±8.0	352.6±23.8	414.1±16.5	125.2±14.4
13-18 years (n=644)	84.4±13.7	80.8±7.3	351.8±23.8	413.5±16.8	125.6±14.7

**mean±SD: mean±standard deviation*

Table II: ECG parameters by age groups and genders of the study participants

Age groups Gender	Heart rate (bpm)*	QRS interval (msec)*	QT interval (msec)*	QTc interval (msec)*	PR interval (msec)*
5-8 years					
Male (n=140)	82.2±12.8	83.0±8.1	344.8±26.7	407.6±19.5	122.4±15.1
Female (n=130)	88.9±15.7	77.2±5.9	357.8±24.5	417.6±16.0	121.9±15.0
9-12 years					
Male (n=194)	85.4±12.6	83.9±8.1	350.4±25.8	411.9±18.0	125.4±15.1
Female (n=195)	87.1±13.8	78.3±6.8	354.9±21.5	416.2±14.5	125.1±13.7
13-17 years					
Male (n=365)	83.4±13.4	83.0±7.6	349.4±24.3	411.6±17.6	125.6±14.8
Female (n=279)	85.6±14.0	77.9±5.8	355.0±22.7	416.0±15.4	125.5±14.7

** mean±SD: mean±Standard Deviation*

Table III: iCEB and iCEBc values by age groups

	Age groups			Difference between age groups
	5-8 years (n=270)	9-12 years (n=389)	13-17 years (n=644)	p
iCEB values *	4.42±0.56	4.39±0.53	4.39±0.52	0.567
iCEBc values*	5.19±0.56	5.15±0.55	5.16±0.52	0.199

**mean ±SD:mean±Standard Deviation, One-way analysis of variance was used*

statistically significant compared to the healthy controls. Their study stated that using iCEBc may be beneficial in addition to other electrocardiographic risk parameters for arrhythmia. In their study, the mean iCEB and iCEBc values in the patient and healthy control groups were 5.04±0.80 vs. 4.94±0.58 and 6.18±0.89 vs. 5.69±0.67, respectively. In our study, the mean iCEB and iCEBc values for all age groups within the 5-17 years range were 4.39±0.53 and 5.16±0.53, respectively. In our study of 1303 cases, iCEB and iCEBc values were lower than those of the above-mentioned healthy control group of 40 cases. In addition, our study detected a significant difference between male and female cases regarding both iCEB and iCEBc values. This issue was not addressed in their research.

In their study on 65 adult healthy control subjects and 40 adult patients, Robyns et al. (14) investigated the effects of drugs with arrhythmogenic potentials, such as sotalol and flecainide, on iCEB and iCEBc values. They suggested using a mean cut-off iCEB value of 4.24±0.5 and a reference range of 3.24–5 for healthy adults. Their study also found higher iCEB values in women than men ($p < 0.001$), which might stem from reduced QRS duration associated with the higher QT interval and smaller heart size under the impact of sex hormones. However, their study showed a lack of any significant difference among age groups concerning this issue. In addition, they emphasised that iCEB is not a heart rate-independent factor and may be beneficial in a specific heart rate range and stressed that in tachycardic patients, the use of corrected iCEB (iCEBc) instead of iCEB may be required (14). Our study's mean iCEB value was 4.39±0.53 for the 5-17 age group. Our mean (±SD) iCEB values were slightly higher than those indicated in the study. In addition, consistent with this study's findings, we observed lower QRS. However, QT and QTc interval values were higher in female than male subjects. The smaller cardiac muscle mass and size in female and male patients may explain this condition. Since our study group consisted of both prepubertal and postpubertal cases, it does not seem possible to say whether this phenomenon is associated with the impact of sex hormones. This issue may be clarified in a separate study. Considering that it may be more appropriate to use iCEBc in cases of increased heart rates, we conceive that the mean iCEBc measurement of 5.16±0.53 can be used as a cut-off value for the 5-17 age group.

The Third National Health and Nutrition Examination Survey (NHANES-III) examined the relationship between iCEBc, all-cause, and cardiac mortality rates in the hitherto most significant number of adult cases (n=5010) (mean age= 51.10±7.67 years; female cases=52.5%) whose electrocardiograms were in sinus rhythm, and was stated that elevated iCEBc (male ≥4.57 and

Table IV: Comparison of iCEB and iCEBc values by age groups and gender of the study participants

	Male (n=699)	Female (n=604)	p
iCEB values*			
5-8 years (n=270)	4.20±0.53 (n=140)	4.66±0.49 (n=130)	<0.001
9-12 years (n=389)	4.22± 0.52 (n=194)	4.56±0.48 (n=195)	<0.001
13-17 years (n=644)	4.25± 0.51 (n=365)	4.58±0.46 (n=279)	<0.001
All age groups 5-17 years (n=1303)	4.23±0.52	4.59±0.47	<0.001
iCEBc values*			
5-8 years (n=270)	4.96±0.54 (n=140)	5.44±0.46 (n=130)	<0.001
9-12 years (n=389)	4.96±0.54 (n=194)	5.35±0.49 (n=195)	<0.001
13-17 years (n=644)	5.0±0.53 (n=365)	5.37±0.44 (n=279)	<0.001
All age groups 5-17 years (n=1303)	4.98±0.53	5.38±0.46	<0.001

***** *mean±SD: mean±Standard Deviation, An independent two-sample t-test was used*

Table V: Percentiles of iCEB and iCEBc values according to the age groups and gender of the study participants

	Male (n=699)		Female (n=604)	
	2p	98p	2p	98p
iCEB values*				
5-8 years (n=270)	3.69	4.71	4.18	5.14
9-12 years (n=389)	3.72	4.72	4.09	5.03
13-17 years (n=644)	3.76	4.74	4.14	5.02
iCEBc values*				
5-8 years (n=270)	4.44	5.48	5.00	5.88
9-12 years (n=389)	4.44	5.48	4.87	5.83
13-17 years (n=644)	4.49	5.51	4.95	5.79

*****mean±SD: mean±Standard Deviation

female ≥4.98) may be an independent risk factor for cardiac or all-cause mortality among middle-aged adults (13-15). In our study, the mean iCEBc value (5.16±0.53) for the 5-17 age group was slightly higher with a similar standard deviation compared to the iCEB value indicated in the study mentioned above. In our research, the 5-17 age group was not evaluated regarding mortality rates. However, consistent with the study's findings, the mean iCEBc value of our female subjects (5.38±0.46) was higher than that of our male subjects (4.98±0.53).

In a retrospective study on smoking habits, Özdemir et al. (16) compared a total of 80 smokers with a mean age of 39.4±8.1 years with a control group of 82 non-smokers age-matched healthy cases. They found that smokers had higher iCEBc values than controls (5.10±0.49 and 4.68±0.39, respectively, p < 0.001), while iCEB values did not differ significantly between groups (4.37±0.46 and 4.32±0.42, respectively; p=0.456). The total number of healthy control subjects in our study (n= 1303) was significantly higher when compared with those (n= 82) included in the study mentioned above. While the mean iCEB value in our research (4.39±0.53) was close to the value indicated in the study mentioned above (4.32±0.42), our iCEBc value (5.16±0.54) was higher than that estimated (4.68± 0.39 in this study). However, both studies' standard deviations calculated for iCEB and iCEBc (0.42 vs. 0.53 and 0.39 vs. 0.54, respectively) were close.

In the study conducted by Afsin et al. (17) with a total of 108 adult atrial fibrillation patients using amiodarone (n=68) or propafenone (n=40) and 50 healthy adult control individuals, respective iCEB and iCEBc values were determined to be 4.2 ±0.4 and 4.6±0.4 in the healthy control group. In our study, the mean iCEB and iCEBc values of the 5-17 age group were 4.39±0.53 and 5.16±0.54, respectively. The mean iCEB and iCEBc values of our male (n= 699) and female (n= 604) participants were 4.23±0.52 vs. 4.59±0.47, and 4.98±0.53 vs 5.38±0.46, respectively. However, the total number of healthy control subjects (n= 50) in the above study was very scarce compared to our study population (n= 1303). While the mean iCEB value in our research (4.39±0.53) was close to the value mentioned in the study mentioned above (4.2±0.4), our mean iCEBc value (5.16±0.54) was higher than the value indicated in their study (4.6±0.4). However, the standard deviations of the mean iCEB (0.4 vs. 0.53) and iCEBc (0.4 vs. 0.54) values were comparable between both studies.

Our study's limitations include the small number of cases, its cross-sectional design, the possibility of missing data due to incomplete family reporting, and the failure to include data on the subsequent cardiological evaluations of the cases due to cross-sectional design.

In conclusion, we have determined that iCEB and iCEBc values in school-age children did not differ according to age groups. Still, these values were significantly different between boys and girls. Among school-age children aged 5-17, 4.23±0.52 and 4.59±0.47 can be used as the mean average cut-off values for iCEB. We think 4.98±0.53 and 5.38±0.46 can be cut-off values

for iCEBc in male and female cases, respectively. Differences in iCEB and iCEBc values between male and female cases may be due to the differences in cardiac muscle mass between genders. Ours is the first comprehensive study that attempts to reveal the typical ranges of iCEB and iCEBc values in school-age children and proposes using separate ranges for boys and girls. More extensive studies are needed on this subject.

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Opinions of Mothers About the Weights of Their Preschool Children and Its Relationship with Their Own Body Perceptions

Annelerin Okul Öncesi Çocuklarının Ağırlığı ile İlgili Görüşleri ve Kendi Beden Algıları ile İlişkisi

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ABSTRACT

Objective: Misperception of children's weight status by their mothers, either lower or higher than it actually is, can lead to incorrect nutrition practices and health problems. This study aimed to evaluate mothers' perceptions about their children's weight and their own weight and determine the sociodemographic factors that may influence their perception.

Material and Methods: The research was a cross-sectional study involving 170 children aged 2-5 and their mothers. For the study, mothers' and children's heights and weights were measured; questionnaires containing verbal (5-point Likert type scale) and visual scales (Toddler Silhouette Scale for children, Contour Drawing Rating Scale for mothers) were administered to mothers to understand their perception of themselves and their children.

Results: As the children's weight-for-height percentile increased, the mothers' accuracy rate in verbal and visual assessment of their children's weight decreased, making them more prone to underestimate the child's weight. On verbal scale, mothers of underweight, normal weight, overweight, and obese children had an accuracy rate of 53.19%, 71.72%, 31.25%, and 0%, respectively, in defining the children's weight status. On visual scale, these rates were 72.34%, 54.55%, 12.50% and 0%, respectively. Overweight and obese mothers were less accurate than others at verbal and visual self-assessment of their own weight. Verbal and visual self-assessment accuracy rates were 100% and 75% in underweight mothers, 75.36% and 89.86% in mothers with normal weight, 47.46% and 32.20% in overweight mothers, and 34.21% and 23.68% in obese mothers. No significant relation was found between the mothers' perceptions of their own weight and their children's weights.

Conclusion: We observed problems related to their mothers' interpretation of children's weight status. We could not identify any sociodemographic risk factor that could explain the inaccurate perception of the mothers. Since mothers may not be able to perceive problems related to their child's weight and express them as problems, we recommend that paediatricians measure each child's height and weight and evaluate their percentiles.

Key Words: Child, Mothers, Preschool, Weight perception

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Contribution of the Authors / Yazarların katkısı*: *ERKAN M: Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar, Providing personnel, environment, financial support tools that are vital for the study, Biological materials, taking responsibility of the referred patients. ***VELİPAŞAOĞLU S:*** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar, Providing personnel, environment, financial support tools that are vital for the study, Biological materials, taking responsibility of the referred patients.

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ÖZ

Amaç: Çocukların ağırlıklarının anneleri tarafından olduğundan düşük ya da yüksek olarak algılanması yanlış beslenme uygulamalarına ve sağlık sorunlarına yol açabilmektedir. Bu çalışmanın amacı, annelerin çocuklarının ve kendilerinin ağırlıkları ile ilgili algılarını değerlendirmek ve bu algıları etkileyebilecek sosyodemografik faktörleri belirlemektir.

Gereç ve Yöntemler: Çalışma 2-5 yaş arasındaki 170 çocuk ve annesinin dahil edildiği kesitsel tipte bir araştırmaydı. Çalışma için annelerin ve çocukların boy ve ağırlıkları ölçüldü; annelere kendine ve çocuğuna dair algısını anlayabilmek için sözel (5'li Likert tipi ölçek) ve görsel ölçekler (çocuklar için Toddler Silhoutte Scale, anneler için Contour Drawing Rating Scale) içeren anketler uygulandı.

Bulgular: Çocukların boya göre ağırlık persentili arttıkça, annelerin çocuklarının ağırlığını sözlü ve görsel değerlendirmesindeki doğruluk oranı azaldı ve bu da onları çocuğun kilosunu hafife almaya daha yatkın hale getirdi. Sözel ölçekte zayıf, normal kilolu, fazla kilolu ve şişman çocukların annelerinin çocuklarını doğru şekilde tanımlama oranları sırasıyla %53.19, %71.72, %31.25 ve %0'dı. Görsel ölçekte ise bu değerler sırasıyla %72.34%, %54.55, %12.50 ve 0%'dı. Fazla kilolu ve şişman annelerin sözel ve görsel öz değerlendirme doğruluğu diğerlerine göre daha düşük saptandı. Sözel ve görsel ölçekte öz değerlendirme doğruluk oranları sırayla zayıf annelerde %100 ve %75, normal kilolu annelerde %75.36 ve %89.86, fazla kilolu annelerde %47.46 ve %32.20 ve şişman annelerde %34.21 ve %23.68 olarak saptandı. Annelerin kendi ağırlıklarına ilişkin algıları ile çocuklarının ağırlıkları arasında anlamlı bir ilişki tespit edilmedi.

Sonuç: Çocukların ağırlık durumlarının anneleri tarafından yorumlanmasında sorunlar olduğu saptandı. Annelerin yanlış algısını açıklayabilecek herhangi bir sosyodemografik risk faktörü tespit edemedik. Annelerin çocuğun ağırlığı ile ilgili sorunları algılayabilmesi ve bir sorun olarak dile getirmesi eksik olabileceği için çocuk hekimlerinin her başvuran çocuğun boy ve ağırlık ölçümünü yapmasını ve persentillerini değerlendirmesini öneririz.

Anahtar Sözcükler: Çocuk, Anne, Okul öncesi, Ağırlık algısı

INTRODUCTION

Healthcare workers frequently see mothers dissatisfied with their children's weight gain or growth during paediatric visits at the outpatient department. Despite mothers' concerns, childhood obesity is an increasing public health problem in all age groups (1-3).

Higher weight can sometimes be considered an indicator of good health and successful parenting (4). Factors such as the parent's weight, the weight status of the child's peers, cultural beliefs, and patterns created in the media have all been shown to influence mothers' perceptions of their children's weight (5-11). For example, compared to other mothers, women who are overweight were found to be more likely to perceive their children's weight lower (6, 7, 12). Mothers of overweight children were also shown to be more likely to view their children's weight as lower than it is (7, 13-16). This appraisal may encourage the mother to overfeed the child to bring him/her to the weight that she perceives as healthy, which may lead the healthy child to become overweight (17,18). On the other hand, if a normal-weight child is regarded as overweight by the caregiver, the child may face food intake and essential nutrient restrictions, leading to malnutrition or eating behaviour disorders (5,17,19, 20).

In this study, we aimed to evaluate mothers' perceptions on (i) the weight status of their children by using different tools (verbal and visual child silhouette scale for children) (ii) how a healthy hypothetical child would look like, and (iii) their own weight status by using verbal and visual contour drawing rating scale for adults.

MATERIALS and METHODS

Ethical approval for the study was obtained from Akdeniz University Non-Interventional Research Ethics Committee (Date 12.02.2014, Number 111).

This study was conducted in a convenience sample between February 2014 and July 2014. The first 170 children between the ages of 2 to 5 years who applied to the outpatient clinics of Akdeniz University Department of Pediatrics and whose mothers consented to participate in the study were included as mother-child dyads. Children who were not with the mother on admission, children under two or older than five years, and children with chronic diseases were excluded from the study.

The mother's and child's height and weight were measured and recorded. For the weight measurements, a calibrated NAN brand scale, which can weigh a minimum of 1 kg and a maximum of 150 kg and has a sensitivity of 50 gr, was used. Children's weight measurements were carried out with underwear or diapers; three consecutive measurements were made, and their averages were recorded. Weight measurements of mothers were made by taking two consecutive measurements, and their averages were recorded. NAN brand height measuring device with 5 mm sensitivity was used for height measurements. All height measurements were made by taking three consecutive measurements, and their averages were recorded.

Children's weight status was determined by weight for height percentiles of the World Health Organization (WHO). A weight for height value less than the 15th percentile was accepted as wasting (underweight), between the 15th and 85th percentile as normal weight, between the 85th and 95th percentile as overweight and more than the 95th percentile as obese. Mothers with a body mass index (BMI) below 18.5 were considered

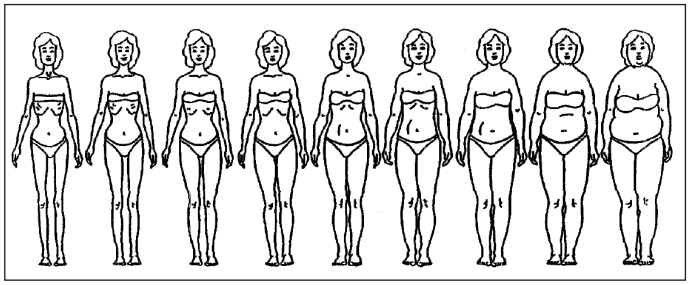

Figure 1: Contour Drawing Rating Scale

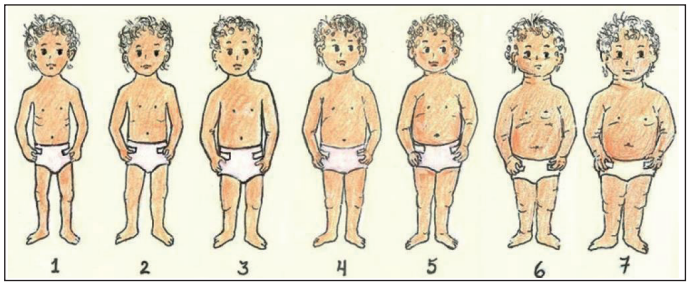

Figure 2: Toddler Silhoutte Scale

underweight; those between 18.5 and 25 were normal; those between 25 and 30 were overweight; and those over 30 were considered obese.

The questionnaire applied to the mothers sought information about the demographic characteristics, the mother's opinion about the weight and nutrition of the child, assessments of the mother's self-perception of her weight status, and evaluation of the mother's perception of the child's weight status.

A verbal scale consisting of "very thin," "thin," "normal," "overweight," and "fat/obese" options were used to evaluate how the mother perceived her weight status verbally. Contour Drawing Rating Scale was used as a visual scale to evaluate how the mother felt about her weight status visually (Figure 1). Contour Drawing Rating Scale is a visual scale consisting of 9 pictures prepared for adult women based on BMI percentiles (21). Picture 1 in the visual scale represented underweight women (BMI <18.5). Pictures 2-3-4-5 and 6 represented normal-weight women (18.5 < BMI < 25), pictures 7 and 8 represented overweight women (25 < BMI < 30), and picture 9 represented obese women (BMI > 30). It was accepted as "correct" if the mother had chosen a picture suitable for her BMI.

A verbal scale consisting of "very thin," "thin," "normal," "overweight," and "fat/obese" options were used to evaluate how the mother perceived the child's weight status verbally. In order to evaluate the mother's opinion about the quantity that the child eats, the options of "my child eats too little," "my child eats little," "my child eats normal," "my child sometimes eats too much," and "my child eats too much" were offered. Toddler Silhouette Scale was used as a visual scale to evaluate the mothers' visual perceptions, satisfaction, and expectations about their children (Figure 2). Toddler Silhouette Scale is a validated visual scale comprising seven pictures representing gender, race, and ethnically neutral children. The scale is prepared for children 2-5 years old and is based on weight for height percentiles (22). Pictures 1 and 2 in the visual scale represented underweight children (weight for height percentile <15), pictures 3-4 and 5 represented normal weight (weight for height percentile between 15-85), picture 6 overweight (weight for height percentile between 85-95) and picture 7 obese children (weight for height percentile > 95).

Statistical analysis

Support was received from the Akdeniz University Department of Biostatistics and Medical Informatics in determining the required number of patients, evaluating the validity of the questionnaire, and statistically evaluating the results.

Data were analysed using PASW 18 (SPSS / IBM, Chicago, IL, USA). Descriptive statistics such as frequency , percentage, median, mean, and standard deviation were used to define the sample. The Chi-square test or Fisher's exact test, where appropriate, was used to compare the proportions in different groups. Since parametric test assumptions were not provided, non-parametric tests (Spearman correlation) were used in comparisons. A p-value less than 0.050 was considered statistically significant.

RESULTS

A total of 170 mother-child dyads were included in the study. The average age of the children was 40.55±10.73 months, and of the mothers was 30.52±5.26 years. Of the children, 88 (51.76%) were female, and 82 (48.24%) were male (Table I).

When children's weight for height percentiles were evaluated, 4.70% of the children were obese, 9.41% were overweight, 58.24% were normal weight, and 27.65% were underweight. The average height of mothers was 160.00±5.56 cm, the average weight was 68.32±14.56 kg, and the mean BMI was 26.60±5.15 (Table I).

The person with whom the child nutrition was most frequently consulted was the family physician (44.71%), then the paediatrician (23.53%), and then others (14.71%). When asked verbally about the mothers who chose the other option, they stated that most of them benefited from the internet. Those consulted less frequently were 5.29% maternal grandmother, 5.29% paternal grandmother, 3.53% spouse, and 2.94% friends (Table I).

When asked who makes the final decision about the child's nutrition, the most common choice was the mother (72.94%), followed by the child (15.88%), spouse (8.82%) and grandmothers (2.35%).

Mother's perception about the child's food intake

In the section where mothers were asked about their assessment of their children's food intake, 37.06% of mothers

Table I: Socio-demographic characteristics of children and parents

Demographic Characteristics	
Children's gender*	
Female	88 (51.76)
Male	82 (48.24)
Age of children (months)†	40.55 ± 10.73
Female	41.13 ± 10.87
Male	39.94 ± 10.59
Height of children (cm)†	97.89 ± 8.56
Female	97.77 ± 8.66)
Male	98.01 ± 8.49
Weight of children (kg)†	14.71 ± 2.91
Female	14.68 ± 3.20
Male	14.75 ± 2.58
Weight for height percentile of children*	
< 15	47 (27.65)
15 - 85	99 (58.24)
85 - 95	16 (9.41)
> 95	8 (4.70)
Age of mother (year)†	30.52 ± 5.26
Mother's BMI (mean)†	26.60 ± 5.15
Mother's BMI*	
< 18.5	4 (2.35)
18.5 - 25	69 (40.59)
25 - 30	59 (34.71)
> 30	38 (22.35)
Mother's education*	
≤ 8 years	116 (68.24)
High School	29 (17.06)
College and more	25 (14.70)
Father's education*	
≤ 8 years	107 (62.94)
High School	36 (21.18)
College and more	27 (15.88)
Family income*	
Expenses are more than income	30 (17.65)
Expenses are equal to income	119 (70.00)
Expense are less than income	21 (12.35)
With whom the mother consults about the child's nutrition*	
Family physician	76 (44.71)
Paediatrician	40 (23.53)
Internet	25 (14.71)
Own mother	9 (5.29)
Mother-in-law	9 (5.29)
Spouse	6 (3.53)
Friends	5 (2.94)
Final decision-maker of the child's nutrition*	
Mother	124 (72.94)
Child	27 (15.88)
Father	15 (8.82)
Paternal / Maternal grandmother	4 (2.35)
Number of people in the household†/‡	4.20 ± 1.70 / 4

**: n(%), †: mean±SD, ‡: median*

said "eats little / too little," 48.8% "eats normally," and 14.2% "eats too much." Being overweight was more common among the children whose mothers stated "eats too much" (p<0.001) (Table II). As the mother's comments about how much her child eats progressed from "eats little" to "eats too much," the child's weight for height percentile increased. A statistically weak correlation was found between the mother's perception of the amount the child eats and the child's weight for height percentile (p=0.003 r=0.223) (Table III).

Mother's perception about the child's weight status determined by verbal scale

On a verbal scale, 59.41% of the mothers could correctly identify their children's weight status. Mothers of normal-weight children were more prone to correctly identify the weight status of their children (71.72%) compared to the mothers of underweight (53.19%), overweight (31.25%) or obese (0%) children (Figure 3). None of the mothers described her child as "fat". As the child's weight for height percentile increased, the rate of correct assessment of the child's weight by the mother decreased (p<0.001) (Figure 4). On the verbal scale, of all mothers, 10.59% overestimated their children's weight, and 27.06% underestimated it. Almost half of the mothers of underweight children overestimated their child's weight. Underestimation of the child's weight status conversely increased as the weight for height percentile of the child increased and reached 100% in the mothers of obese children (Figure 4). A moderate correlation was found between the verbal scale and the child's weight for height percentile (p<0.001 r=0.428) (Table III).

Mother's perception about the child's weight status determined by visual scale (Toddler Silhouette Scale)

On the visual scale, 52.94% of the mothers made the correct assessment by choosing the picture corresponding to their child's percentile range. Correct identification of the silhouette that corresponds to the actual weight was highest among the mothers of underweight children (72.34%) compared to the mothers of normal weight (54.55%), overweight (12.50%), or obese children (0%). No mother described her child with the silhouette corresponding to an obese child. As the child's weight for height percentile increased, the rate of correct assessment of the child's weight on the visual scale by the mother decreased (p<0.001) (Figure 5). While 38.82% of the mothers found their children compatible with a picture in the lower weight group than their current status (visual underestimation), 8.24% chose a picture compatible with a weight higher than their actual status (visual overestimation). Underestimation of the child's weight status on visual scale increased as the weight for height percentile of the child increased and reached 100% in the mothers of obese children. While the rate of overestimating their child's weight was 72.34% in underweight children's mothers, it decreased as the weight for height percentile increased (Figure 5). There was a weak correlation between children's weight for height percentile and the picture chosen by the mothers to characterise their child's body structure in the Toddler Silhouette Scale (p<0.001 r=0.369) (Table III).

As the child's weight for height percentile increased, the mother's accuracy rate in verbal and visual assessment of her

Table II: Mother's view about the amount the child eats compared to the actual weight for height percentile of the child

Mother's view about the amount the child eats	Actual weight for height percentile of the child			
	Underweight*	Normal*	Overweight*	Total*
Eats too little / Eats little	20 (31.75)	40 (63.49)	3 (4.76)	63
Eats normal	22 (26.51)	52 (62.65)	9 (10.84)	83
Sometimes eats too much / Eats too much	5 (20.83)	7 (29.17)	12 (50.00)†	24

**: n(%), †: The rate of overweight children was significantly higher compared to the other groups (p< 0.001) (Pearson Chi-Square)*

Table III: Correlation results

	r *	p
Mother's perception of the amount the child eats and the child's weight for height percentile	0.223	0.003
Mother's verbal assessment of the child and the child's weight for height percentile	0.428	<0.001
Mother's visual assessment of the child and the child's weight for height percentile	0.369	<0.001
The pictures the mothers wanted their children to look like and those they chose for healthy children	0.826	<0.001
Mothers' BMI values and the pictures they chose from the visual scale for herself	0.690	<0.001

**Spearman's rho*

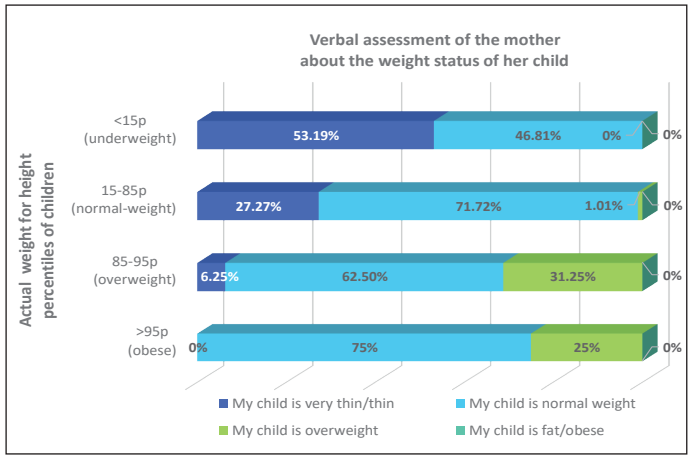

Figure 3: Mothers verbal assessment compared to the actual weights of the children

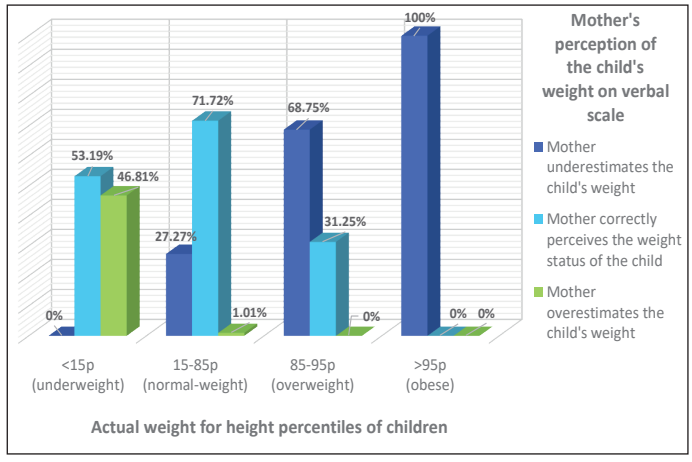

Figure 4: Mothers' perceptions of the children's weight on verbal scale compared to the actual weight for height percentiles of children

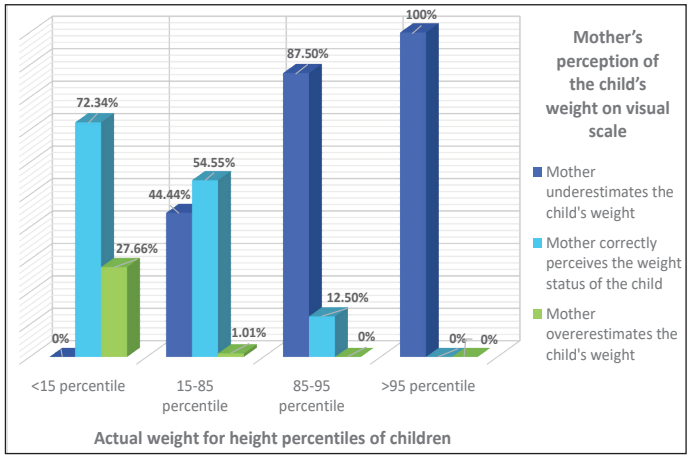

Figure 5: Mothers' perceptions of the children's weight on visual scale compared to the actual weight for height percentiles of children

child decreased (p <0.001) (Figure 4 and Figure 5). No relation was found between the mother's accuracy in the visual or verbal assessment of her child with the mother's BMI, education level or working status, or the number of people in the household.

Mother's preference for the ideal appearance that her child may have on the visual scale (Toddler Silhouette Scale)

When the mothers were asked about the appearance they wanted their child to have, 15.88% preferred an underweight picture, 82.94% a normal-weight, and 1.18% an overweight picture. No mother preferred an obese picture. In addition, 78.72% of underweight children's mothers, 83.84% of normal-weight children's mothers, 93.75% of overweight children's mothers, and 87.50% of obese children's mothers chose normal-weight images as the desired appearance for their child to have (Figure 6).

Mother's perception of a healthy child's appearance on the visual scale (Toddler Silhouette Scale)

When the mothers were asked "to which picture a healthy child should look like," of all mothers, 12.94% chose an underweight picture, 85.88% chose a normal-weight picture, 0.59% chose an overweight picture, and 0.59% chose an obese picture.

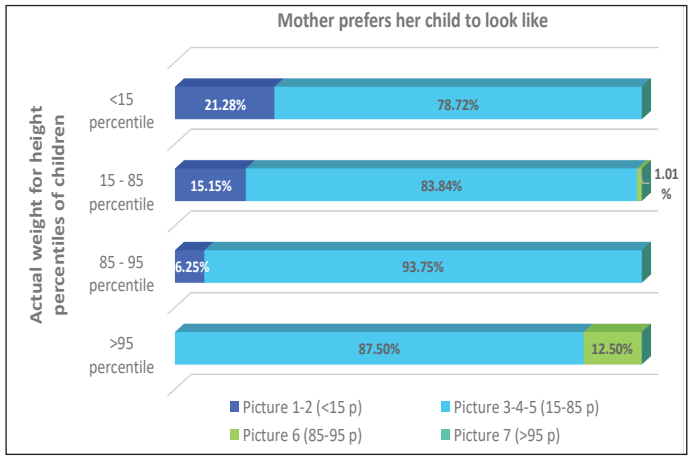

Figure 6: Distribution of mothers' preferences for the appearence of their own children compared to the weight status of the child

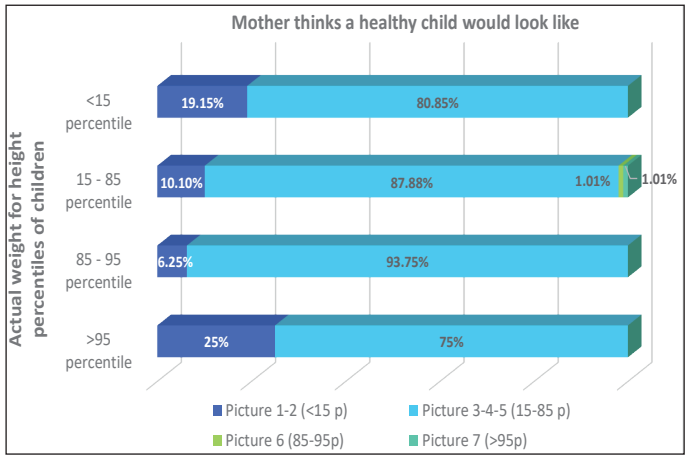

Figure 7: Mothers' preferences on the appearance of healthy children compared to the actual weight for height percentiles of their own children

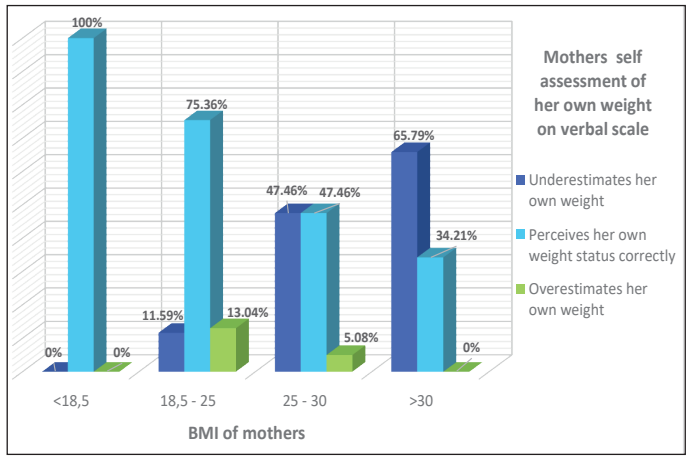

Figure 8: Mothers' perceptions of their own weight on verbal scale compared to their actual BMI

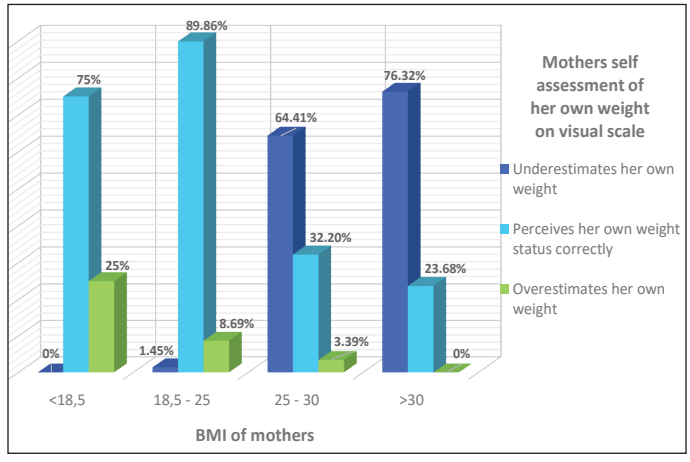

Figure 9: Mothers' self assesment of their own weight on visual scale according to their actual BMI

For the appearance of a hypothetical healthy child, 80.85% of underweight children's mothers, 87.88% of normal-weight children's mothers, 93.75% of overweight children's mothers, and 75% of obese children's mothers chose normal-weight images (Figure 7). There was a strong correlation between the pictures the mothers wanted their children to be and those they chose for healthy children (p<0.001 r=0.826) (Table III).

Mother's perception about her appearance on the verbal scale

On the verbal scale, 57.06% of the mothers correctly described their own weight status, while 35.88% underestimated and 7.06% overestimated it. Underestimation of weight was highest in obese mothers (65.79%) (Figure 8). On the verbal scale, the rate of an accurate description of own weight was 100% in underweight, 75.36% in normal-weight, 47.46% in overweight, and 34.21% in obese mothers (Figure 8). The rate of overweight and obese mothers correctly defining their weight status on the verbal scale was significantly lower than in other groups (p <0.001).

Mother's perception of her weight status on the visual scale (contour drawing scale)

When the mother's visual perception of her weight was evaluated, the rate of choosing the correct picture reflecting the actual weight status was 54.71%. Of the mothers, 40% chose the slimmer picture, and 5.29% chose the picture with a higher weight than their actual state. While the rate of visual evaluation success was 75% in underweight mothers and 89.86% in normal-weight mothers, this rate decreased to 32.20% in overweight and 23.68% in obese mothers (Figure 9). Visual evaluation success was lower in overweight and obese mothers than in the normal-weight or underweight groups (p <0.001). Mothers' actual BMI values correlated well with the pictures they chose from the visual scale (p <0.001 r=0.690) (Table III). There was no relation between the mothers' self-perception accuracy and their assessment accuracy of the children's weight status on the verbal or visual scale.

Mother's preference for the ideal appearance of herself

The mothers were asked about the weight they wanted to have, and their hypothetical BMI corresponding to their desired weight

was calculated. While the actual BMI mean of the mothers was 26.60±5.14, the mean BMI they wanted to be was 23.10±2.20. The weight they determined as ideal for themselves was an average of 9±10.90 kg less than their current weight.

In a question, the mothers were asked which of the visual scale's pictures they wanted to look like. The BMI corresponding to the chosen images was compared with the BMI calculated from the weight they wanted to be. When the BMI of the weight that the mothers wanted to be and the BMI of the picture they chose from the visual scale for desired appearance were compared, it was found that 52 (30.59%) mothers could not achieve the desired appearance even if they reached their ideal weight. Their desired weight condition did not meet their visual expectations.

DISCUSSION

This study showed that the mother often makes the final decision regarding the child's nutrition (72.94%). Determining the content and amount of nutrition by only the mother may cause the child to remain passive about eating and cause problems in the development of eating behaviour. Problems in the mother's perception of child's weight can affect the child's weight and health status (19).

While 4.71% of the children in the study group were obese, 27.65% were underweight. The high rate of underweight children in the study group may be due to the selection of the convenience sample from outpatient departments of the hospital instead of the community. Although the presence of chronic disease was excluded, we did not evaluate prospectively the health status of children who were found to be "underweight" because it was not within the main target of this study. Another reason for the high rate of underweight children may be the use of WHO percentiles. In this study, we used the weight for height percentiles of the WHO since the pictures on the Toddler Silhouette Scale were based on WHO percentiles. The study results may need to be reinterpreted with Turkish reference values for weight percentiles instead of WHO standards. However, we did not choose this option to maintain harmony with the visual scale.

Of the mothers, 10.59% on verbal and 8.24% on the visual scale overestimated their children's weight. This means that one in ten children may be at risk of unrecognised nutritional needs or unnecessary food restrictions. Mothers' overestimation of their children's weight might have contributed to the high rate of underweight children in the study group. Previous research has revealed that mothers who are prejudiced against their weight and nutritional behaviour may negatively affect their children's eating behaviour (20). If the mother overestimates her child's weight when the child is at an average weight, she may make excessive restrictions for her child to lose weight (17,19).

When the mothers' perceptions about their children's weight are incorrect, they cannot recognise necessary cues on nutrition, so children are at risk for nutrition-related diseases (e.g., obesity, diabetes) (4, 5,19, 23, 24). In our study, 27.05% of the mothers verbally and 38.82% visually perceive their children at a lower weight than their actual state. Studies show that mothers - especially mothers of overweight children - underestimate their child's weight (7,11,13,15,16, 25). In accordance with the literature, we found that overweight and obese children were more commonly underestimated by their mothers than others ($p < 0.001$).

In a systematic review of the difference between parental perception and actual weight status of children, 32.90% of 35103 children who were evaluated were found to be overweight, and 62.40% of those children's weight was underestimated by their families (10). In our study, the weight status of all the obese children and most of the overweight children (87.50%) were underestimated by their mothers. This high underestimation rate poses a significant obstacle to the recognition of overweight and obesity disorders and the appropriate management of risks. Considering only obese children, nearly three-quarters of the mothers rated their child at an average weight, and a quarter rated their child overweight. No mother chose the "obese" option for her child in the verbal scale or picture 7, which figured an obese child on the visual scale. This may be related to mothers' underestimation of children's weight or may also be due to the mother's hesitation to label her child as "obese."

There are studies supporting that mothers' perceptions of their children's weight are affected by many factors, such as their own weight status, their children's weight status, cultural beliefs, and stereotypes created in the media (6, 8, 24). In the study conducted by Yalçın et al., parental perception of the child's weight was not found to be related to factors such as the gender of the child or the education of the parents (25). Our study found no relation between the mother's perception of the child's weight and the mother's BMI, the parents' educational or working status, and the family's income.

We found that the verbal and visual self-perception accuracy of overweight or obese mothers was lower than others ($p<0.001$). However, there was no significant difference in the accuracy of perception of their child's weight between overweight or obese mothers and others. Gregori et al. (23) evaluated mothers' perceptions of their children's weight in a study and found that overweight/obese mothers were more prone to perceive their children's weight as lower. Thus, contrary to Gregori et al. (23), we found that mothers' weight status does not determine their perception of their children's weight. Gregori et al.(23) included 2720 mother-child pairs from 10 countries in their study and found that the mother's being overweight increased the risk of misperception by 1.19 times. This difference may not have been able to be detected due to the smaller number of participants in

our study. Since more than 60% of the participants in Gregori et al.'s (23) study were from one country (India) and the rest were from 9 countries, their results may have been heavily influenced by Indian culture. In this case, cultural differences may be effective in finding different results in our study.

In our study, mothers' perception of healthy children was highly (85.88%) compatible with normal-weight images. We found a strong correlation between the pictures mothers chose for the appearance they wanted their children to have and those they chose for healthy children ($p<0.001$ $r=0.826$). Although mothers experienced difficulties in evaluating their children's actual weight for height, they were able to choose more accurate options when hypothetical situations were mentioned (which picture they want their children to look like and which picture a healthy child should look like). This suggests that they are able to make an accurate assessment at the cognitive level, but their perceptions change when it comes to their children.

In conclusion, we observed problems related to the interpretation of children's weight status by their mothers. Since mothers may not be able to perceive problems related to their child's weight and express them as problems, we recommend that paediatricians measure each child's height and weight and evaluate their percentiles. We could not identify any socio-demographic risk factor (such as maternal age, education, income, and mother's weight status) that could explain the inaccurate perception of the mothers. In order to improve child health, we believe that qualitative studies are needed to understand the basis of the subjective perceptions of the mothers about the weight status of their children.

Strengths and limitations of the study

Evaluating mothers' perceptions of weight both towards themselves and their children is one of the strengths of the study. Using verbal and visual evaluations together also adds strength to the study.

One of the limitations of the study is that it is a hospital-based study. This may have worsened the high rates of underweight children. Since the study was hospital-based and the number of participants was limited, the results may not be generalisable to society. Another limitation is that WHO percentages were used when evaluating children's weight for height in order to be compatible with the Toddler Silhouette Scale. The use of WHO percentiles may have worsened the high rate of underweight children and may have contributed to mothers of underweight children overestimating their children.

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Türkiye Çocuk Hastalıkları Dergisi

Evaluation of Serum Renalase in Children with Recurrent Urinary Tract Infection and Renal Scars

Tekrarlayan İdrar Yolu Enfeksiyonu ve Renal Skarı Olan Çocuklarda Serum Renalazın Değerlendirilmesi

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ABSTRACT

Objective: Recurrent urinary tract infections (UTI) are important risk factors for renal scarring. The aim of the study was to assess the relationship between renalase and renal scars in children.

Material and Methods: The study included 78 patients with recurrent UTI and 20 healthy controls. All patients had voiding cystourethrography and dimercaptosuccinic acid (DMSA) scintigraphy. Serum renalase level were analyzed in children with recurrent UTI and controls.

Results: The study included the 78 patients with a history of recurrent UTI (7 boys, 9.0%; 71 girls, 91.0%) and 20 healthy children (3 boys, 15%; 17 girls, 85%) were included in the study. The mean age of the patients and healthy controls were 11.71±0.91 years and 12.35±1.83 years, respectively. Vesicoureteral reflux (VUR) was detected in 48.7% of patients (38/78). Of 45 recurrent UTI with renal scar, 71% also had VUR. The renalase level of the recurrent UTI group was found to be significantly higher than the control group (p=0.014). Renalase level was found to have a significant relationship with renal scars. The mean renalase level of the scar group was found to be significantly higher than the scar-free group (p=0.005). It was found that there was no statistical difference between the renalase means of children with scars depending on whether they had VUR or not (p=0.688).

Conclusion: This study suggests that renalase may play an important role in the formation of renal fibrosis and scars. After clarifying the role of renalase in renal scarring, it might come up as a new agent to prevent fibrosis and scar tissue development in patients with recurrent urinary tract infections.

Key Words: Children, Recurrent UTI, Renalase, Renal scar, Vesicoureteral reflux

ÖZ

Amaç: Tekrarlayan idrar yolu enfeksiyonları (İYE), böbrek skarlaşması için önemli bir risk faktörüdür. Çalışmanın amacı çocuklarda renalaz düzeyleri ile böbrek skarları arasındaki ilişkiyi değerlendirmekti.

Gereç ve Yöntemler: Çalışmaya tekrarlayan İYE geçiren 78 hasta ve 20 sağlıklı kontrol dahil edildi. Tüm hastalara işeme sistoüretrografisi ve dimerkaptosüksinik asit (DMSA) sintigrafisi çekildi. Tekrarlayan İYE geçiren çocuklarda ve kontrollerde serum renalaz düzeyi analiz edildi.

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Contribution of the Authors / Yazarların katkısı*: *ARSLAN M: Planning methodology to reach the conclusions, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the }results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Providing personnel, environment, financial support tools that are vital for the study, Biological materials, taking responsibility of the referred patients. ***BAYRAKÇI US:*** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. Providing personnel, environment, financial support tools that are vital for the study, Biological materials, taking responsibility of the referred patients. ***YAKUT Hİ:*** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Reviewing the article before submission scientifically besides spelling and grammar. Providing personnel, environment, financial support tools that are vital for the study, Biological materials, taking responsibility of the referred patients. ***ÇERKEZOĞLU AA:*** Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Providing personnel, environment, financial support tools that are vital for the study, Biological materials, taking responsibility of the referred patients.

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Bulgular: Çalışmaya tekrarlayan İYE öyküsü olan 78 hasta (7 erkek, %9.0; 71 kız, %91.0) ve 20 sağlıklı çocuk (3 erkek, %15; 17 kız, %85) dahil edildi. Hastaların ve sağlıklı kontrollerin yaş ortalaması sırasıyla 11.71±0.91 yıl ve 12.35±1.83 yıldı. Hastaların %48.7'sinde (38/8) Vezikoüreteral reflü (VUR) tespit edildi. Tekrarlayan İYE' lerin 45'inde skar, bunların da %71'inde VUR vardı. Tekrarlayan İYE grubunun renalaz düzeyi kontrol grubuna göre anlamlı olarak yüksek bulundu (p=0.014). Renalaz düzeyinin böbrek skarları ile anlamlı bir ilişkisi olduğu bulundu. Skarlı grubun ortalama renalaz düzeyi skarsız gruba göre anlamlı olarak yüksek bulundu (p=0.005). Skarlı çocukların renalaz ortalamaları arasında VUR olup olmamasına göre istatistiksel olarak farklılık olmadığı belirlendi (p=0.688).

Sonuç: Bu çalışma renalazın renal fibrozis ve skar oluşumunda önemli bir rol oynayabileceğini düşündürmektedir. Renalazın renal skarlaşmadaki rolünün aydınlatılmasının ardından tekrarlayan idrar yolu enfeksiyonu olan hastalarda fibrozis ve skar dokusu gelişiminin önlenmesinde yeni bir ajan olarak gündeme gelebilir.

Anahtar Sözcükler: Çocuklar, Tekrarlayan idrar yolu enfeksiyonu, Renalaz, Renal skar, Vezikoüreteral reflü

INTRODUCTION

Urinary tract infections (UTI) are one of the most common infections in childhood, and approximately one-third of children experience recurrent infections after an initial UTI, especially during the first six to 12 months. In UTI, acute clinical findings such as irritability, vomiting, decreased sucking, fever, dysuria, urinary frequency and flank pain may be observed, and permanent kidney scarring may also develop (1,2). The rate of renal scarring increases significantly, especially after the third UTI (3).

The most common cause of chronic kidney disease in American, Italian, Belgian and Turkish children is congenital structural anomalies of the kidneys and urinary tract (4,5). Vesicoureteral reflux (VUR), a risk factor for recurrent UTI and renal scarring, is detected in approximately 40% of patients investigated for first UTI (1,6). Early diagnosis and follow-up of VUR and renal scars are important and Tc-DMSA scintigraphy is the gold standard in detecting renal scars (7). There is a need to investigate new, more useful and noninvasive markers detect scars.

Renalase is a monoamine oxidase primarily originating from the renal proximal tubule, responsible for the degradation and inactivation of catecholamines. Renalase also exhibits cytoprotective (including cardioprotective and nephroprotective) effects (8,9). Although the relationship between renalase and kidney diseases is known, there are very few studies published to date on renalase levels in children. In their study, Skrzypczyk et al. (9) found a negative relationship between renalase level and glomerular filtration rate in children with glomerular kidney disease. They also revealed that renalase levels in patients with chronic kidney disease were significantly higher than their healthy controls (9).

In our study, we aimed to demonstrate the relationship between serum renalase levels and presence of renal scars in pediatric patients with recurrent urinary tract infection.

MATERIALS and METHODS

The study included 78 patients with recurrent UTI who were followed up in the Pediatric Nephrology Outpatient Clinic of the University of Health Sciences, Ankara Child Health and Diseases Hematology Oncology Training and Research Hospital, between July 2017 and June 2018. While 45 of the patients with recurrent UTI had renal scars, 33 had no scars. 20 healthy children of similar age and gender to the patient group were determined as the control group. Patients with accompanying systemic disease, active UTI, and chronic renal failure were not included in the study.

While blood tests were taken from the patients during their routine controls, 2 cc blood samples were taken to measure renalase levels and were centrifuged and stored at -80° C. All patients had voiding cystourethrographies and children with vesicoureteral reflux were recorded. Patients in the study group were grouped as normal, scarred, and atrophic kidney patients according to dimercaptosuccinic acid (DMSA) scintigraphy results. None of the patients whose renalase levels were measured had an active infection. The control group consisted of healthy children who applied to general pediatric outpatient clinics for various reasons. When blood was taken from these patients for any reason, an extra 2 cc blood sample was taken and centrifuged and reserved for renalase level testing. Renalase was studied using the ELISA (Sandwich ELISA) method with the "LifeSpan Biosciences Human Renalase, USA" kit in the microbiology laboratory of our hospital, with the Etimax 3000 microeliza device. Normal values were determined as 0.78-50 ng/ml, which the kit perceives as normal, and values below 0.78 ng/ml were determined to be lower than normal. Written consent was obtained from the patients' families to participate in the study. The study was approved by the Ethics Committee of Ankara Children's Health and Diseases Hospital (2017-088/14.06.2017).

Statistical evaluation of the data was performed using Statistical Package for the Social Sciences (SPSS Inc., Armonk, NY, IBM Corp., USA) for Windows version 20.0. In the analysis of quantitative data, compliance with normal distribution was examined with "Kolmogrov Simirnov" and "Shapiro-Wilk tests". In comparisons of two independent groups, the "Independent Samples t" test was used if it showed a normal distribution, and the "Mann-Whitney U" test was used if it did not. The data were examined at a 95% confidence level and the test was considered significant if the p value was less than 0.050.

RESULTS

The study included the 78 patients with a history of recurrent UTI (7 boys, 9.0%; 71 girls, 91.0%) and 20 healthy children (3 boys,

Table I: Evaluation of the relationship between Renal scar and VUR

	VUR n (%)		Total
	+	-	
Renal Scar			
+	32 (71)	13 (29)	45
-	6 (18.2)	27 (81.8)	33
Total	38 (48.7)	40 (51.3)	78

Table II. Relationship between groups and Renalase level

	Renalase level (ng-ml) (mean±SD)	p
Recurrent UTIs group (n=78)	2.5±0.2	0.014
Control group (n=20)	1.7±0.4	
Renal scar + group (n=45)	2.8±3.1	0.005
Scar-free group (n=33)	2.0±0.4	

15%; 17 girls, 85%) . The mean age of the patients in recurrent UTI group and healthy controls were 11.71±0.91 years and 12.35±1.83 years, respectively. VUR was detected in 48.7% of patients (38/78) followed up with recurrent UTI. The most common stage 5 VUR (14.1%) was observed. While DMSA scintigraphy was reported normal in 42.3% of the patients (n=33), scars were detected in one kidney in 11 patients (14.1%) and in both kidneys in 6 patients (7.7%). Unilateral atrophic kidneys were detected in 28 (35.9%) patients. Of 45 recurrent UTI with renal scar, 32 (71%) also had VUR and of 33 recurrent UTI without renal scarring, 6 (18.2%) had VUR (Table I).

The renalase level of the recurrent UTI group was found to be significantly higher than the control group (p=0.014). However, renalase levels were within normal limits in both groups. Renalase level was found to have a significant relationship with renal scarring. The mean renalase level of the scar group was found to be significantly higher than the scar-free group (p=0.005) (Table II). It was found that there was no statistical difference between the renalase means of children with scars depending on whether they had VUR or not (p=0.688).

DISCUSSION

In our study, VUR was detected in 48.7% (38/78) of patients with recurrent UTI, and stage 5 VUR was the most common (14.1%). Known risk factors associated with recurrent UTI include have a grade 3–5 VUR and Voiding cystourethrographies are recommended to investigate VUR and other anatomical bladder defects in children with recurrent febrile UTI (10,11).

Renal scarring was detected in 57.6% (45/78) of our patients with recurrent UTI, and 71% (32/45) of patients with renal scar also had VUR. National Institute for Health and Care Excellence (NICE) guidelines recommend DMSA scans 4-12 months after acute infection to detect renal scars in children with recurrent UTI (12). VUR, which can be complicated by recurrent UTI, can cause chronic kidney damage and scarring (13). Approximately 40-60% of all children with a febrile UTI develop permanent renal scars (14).

Renalase is a monoamine oxidase that degrades catecholamines, mainly of renal origin but is also found in the heart, skeletal muscle, small intestine and liver. Three main factors determine the level of renalase in the blood: renal function, renal perfusion and serum catecholamine levels (15). Previous pediatric and adult studies have shown that renalase is negatively correlated with GFR and renalase levels increase in proportion to the deterioration of kidney functions (9,16). While Malyszko et al. (16), Zbroch et al. (17) and Skrzypczyk et al. (9) showed that renalase level increased in chronic kidney patients, Desir (18) suggested that renalase level decreased. Janusz et al.(19) also showed that renalase levels were significantly lower in children with solitary kidneys. The studies show that renalase production is primarily impaired in CKD patients and increases with disease progression (20). The increase in renalase levels in chronic kidney disease patients suggests a compensatory production in extrarenal organs, possibly in response to catecholamine excess, sympathetic nervous system activation, or oxidative stress, which are common in these patients (21). Skrzypczyk et al. (9) found that renalase was 59.45±23.25 µg /mL in children with chronic kidney disease and 27.20±5.15 µg /mL in the control group. Serum and urine renalase median levels in children with solitary functioning kidney was found, 23.07 µg/mL and 145.28 ng/mL, respectively in a study by Taranta-Janusz et al. (8) (Detection range was 3.12-200 ng/mL). No normal range or cutoff value is given for serum renalase. In our study, renalase levels were found to be significantly higher in patients with recurrent UTI (2.5±0.2 ng/mL) than in the control group (1.7±0.4), and in the renal scar group compared to the scar-free group. It was found that there was no statistical difference between the renalase means of children with renal scars depending on whether they had VUR or not. In line with our results, we consider increased renalase levels as a sign of increased renal scarring.

A study in cultured human kidney-2 cells showed that renalase removes TGF-β1-mediated renal tubular fibrosis by silencing the ERK1/2 MAPK activation pathway (22). Wu et al. (23) showed that in their recent study, renalase prevents renal fibrosis by preventing endoplasmic reticulum stress and down-regulating GSK-3β/SNAIL signaling. Wu et al. (22) in their study evaluating the therapeutic efficacy of renalase in rats with complete unilateral ureteral obstruction, they showed that renalase could improve renal interstitial fibrosis. Therefore, they stated that exogenous renalase supplementation may be an effective agent for slowing chronic kidney disease progression. But there are still no human studies on this subject (22). There are a limited number of studies examining the relationship between renalase and kidney diseases in children, and there are no studies in the literature investigating the relationship between renal scar and renelase. Renalase has been shown

to be a biomarker of chronic kidney disease and to alleviate renal necrosis, apoptosis, and inflammation. However, despite significant evidence for a relationship between renalase and renal pathophysiology, its precise role in renal physiology and pathology remains unclear due to conflicting study results (21).

More comprehensive studies are needed to determine the relationship between renalase and renal scarring and to answer the question of whether it can be used as an early marker of scarring. Additionally after clarifying the role of renalase in renal scarring, it might come up as a new agent to prevent fibrosis and scar development in patients with recurrent urinary tract infections.

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Evaluation of Sleep Disorders in Childhood Allergic Diseases

Çocukluk Çağında Alerjik Hastalıklarda Uyku Bozukluklarının Değerlendirilmesi

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ABSTRACT

Objective: Sleep is a vital component of human life that serves many critical roles in physical and mental health, and well-being. There were few studies on children, diagnosed with allergic diseases, especially preschool children. The aim of our study mas to evaluate sleep disorders in children with allergic diseases.

Material and Methods: This retrospective study was conducted in Dr. Burhan Nalbantoğlu Hospital Child Immunology and Allergy outpatient clinic between January 1 and March 20, 2024, patients included who were diagnosed with allergic rhinitis, asthma and/or atopic dermatitis.The 'Sleep Disturbance Scale for children (SDSC) was applied to the parents by the researcher during the outpatient clinic visit.

Results: In this study, 145 patients were involved. Five (3.4%) patients had clinically significant SDSC score. There was a statistically significant difference in the Children's Sleep Disturbance Scale mean score between having and not having symptoms of allergic diseases. Patients diagnosed wheezy child tended to have higher mean score of SHY. Among patients having symptoms of allergic diseases, there was statistically significant difference in the SDSC mean score between having nose congestion, cough, and activity limitation and not having these symptoms. Patients using oral antihistaminic treatment tended to have higher total mean scores of SDSC.

Conclusion: In this study, out of 145 patients, 5 (3.4%) patients had clinically significant SDSC score. Patients having symptom of allergic diseases tended to have higher total mean score of childrens' sleep disturbance scale. Patients diagnosed wheezy child tended to have higher mean score of SHY. Patients having nose congestion, cough, and activity limitation tended to have higher total mean score of SDSC.

Key Words: Allergic rhinitis, Asthma, Child, Sleep disorders

ÖZ

Amaç: Uyku, fiziksel ve ruhsal sağlıkta ve refahta birçok kritik rol oynayan insan yaşamının hayati bir bileşenidir. Literatürde alerjik hastalık tanısı alan çocuklarla, özellikle de okul öncesi çağdaki çocuklarla ilgili çok az çalışma sunulmuştur. Çalışmamızın amacı alerjik hastalığı olan çocuklarda uykku bozukluklarının değerlendirilmesiydi.

Gereç ve Yöntemler: Bu retrospektif çalışma, 1 Ocak-20 Mart tarihleri arasında Hastanemiz Çocuk İmmunoloji ve Alerji Polikliniği'nde alerjik rinit, astım ve/veya atopik dermatit tanısı konulan hastalar arasında gerçekleştirildi. Poliklinik ziyareti sırasında araştırmacı tarafından ebeveynlere 'Çocuklar için Uyku Bozuklukları Ölçeği (SDSC)' uygulanmıştır.

Bulgular: Bu çalışmaya 145 hasta dahil edildi. Beş (%3.4) hastada klinik olarak anlamlı SDSC skoru saptandı. Alerjik hastalık semptomu olan ve olmayan hastaların uyku bozukluğu ölçeği toplam puan ortalamaları arasında istatistiksel olarak anlamlı farklılık olduğu saptandı. Alerjik hastalık belirtileri olan hastalar arasında SDSC (değişmeyecek) toplam puan ortalaması ile burun tıkanıklığı, öksürük ve aktivite kısıtlılığı olan hastalar arasında istatistiksel olarak anlamlı fark olduğu saptandı. Oral antihistaminik tedavi kullanan hastaların ortalama skorları daha yüksek olma eğilimindeydi.

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Conflict of Interest / *Çıkar Çatışması*: On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethics Committee Approval / *Etik Kurul Onayı*: This study was conducted in accordance with the Helsinki Declaration Principles. The study was received from the ethics committee of KKTC Burhan Nalbantoğlu State Hospital. (approval number: E.K.13/24-15.04.2024).

***Contribution of the Authors / Yazarların katkısı*:** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar.

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Sonuç: Bu çalışmada 145 hastanın 5'inde (%3.4) klinik olarak anlamlı SDSC (değişmeyecek) skoru saptandı. Alerjik hastalık belirtileri olan hastaların çocuk uyku bozukluğu ölçeği ortalama puanın daha yüksek olduğu görüldü. Burun tıkanıklığı, öksürük ve hareket kısıtlılığı olan hastaların ortalama SDSC (değişmeyecek) puanı daha yüksek olma eğilimindeydi.

Anahtar Sözcükler: Astım, Alerjik rinit, Çocuk, Uyku bozuklukları

INTRODUCTION

Sleep is a vital component of human life that serves many critical roles in physical and mental health, and well-being (1-3). Optimum sleep is important for the child's growth, development, learning, school performance, general health, and immune function (4-6).

Pediatric sleep disorders are common; their prevalence ranges from 10–28% (6). Sleep problems ranges from short-term difficulties in falling asleep to more serious sleep disorders such as obstructive sleep apnea (OSA) (7). Epidemiologic studies indicate that up to 50% of children experience a sleep problem, and about 4% have a diagnosis of formal sleep disorder (8).

Allergic diseases have a significant impact on quality of life. Globally, asthma and allergic rhinitis affects 4–10%, and 10–30% of the whole population respectively (9). In Cyprus, the prevalence of asthma and allergic rhinoconjunctivitis in children were 8.7-11.4% and 2.6-4.9% respectively (10). Atopic diseases, such as asthma, allergic rhinitis, and atopic dermatitis can influence sleep and following daytime functioning (11). In literature, it was observed that there was a statistically significant association between sleep disorders and allergy-related outcomes (12).

There were few studies on children, diagnosed with allergic diseases, especially preschool children (7,13,14). The aim of our study was to evaluate sleep disorders in children with allergic diseases.

MATERIALS and METHODS

This retrospective study was conducted in Dr. Burhan Nalbantoğlu Hospitals' Child Immunology and Allergy outpatient clinic between January 1 and March 20, 2024. This study included 145 patients who applied to the Pediatric Immunology and Allergy outpatient clinic and were diagnosed with allergic rhinitis, asthma and/or atopic dermatitis. Asthma was diagnosed according to Global Initiative for Asthma guideline (GINA) (15). Allergic rhinitis (AR) was diagnosed according to the Allergic Rhinitis and Their Impacts on Asthma (ARIA) guidelines (16). Atopic dermatitis was diagnosed according to Hanifin-Rajka criteria (17).

Inclusion criteria of the patients were determined as being followed in the Pediatric Immunology and Allergy outpatient clinic with asthma, allergic rhinitis, and/or atopic dermatitis, and being between 3 and 18 years age.

We collected data from medical records including medical history, demographic information such as age, gender, having additional allergic disease, and having concomitant chronic disease, and having symptoms, physical examination, laboratory findings, and treatments given. For asthma symptom control analyse, GINA assessment of asthma control for children were used (15).

The 'Sleep Disturbance Scale for children (SDSC) was applied to the parents by the researcher during the outpatient clinic visit (18, 19). The SDSC was originally validated on a sample of 1157 healthy children from the general population (18). According to Romeo and et al. (15), the internal consistency and the factor analysis support the use of SDSC as an evaluation tool even at preschool age (20). It investigates the occurrence of sleep disorders during the previous 6 months, and contains 26 items in a Likert- type scale with values 1-5 (higher numerical values reflect a higher frequency of occurrence of symptoms). The sum of scores provides a total sleep score with a possible range from 26 to 130. The original factor analysis yielded six sleep disturbance factors representing the most common areas of sleep disorders in childhood and adolescence: disorders of initiating and maintaining sleep (DIMS); sleep breathing disorders (SBD); disorders of arousal (sleepwalking, sleep terrors, nightmares) (DA); sleep wake transition disorders (SWTD); disorders of excessive somnolence (DOES); and sleep hyperhidrosis (SHY) (18). In this study, the Turkish version of SDSC, for which validity and reliability studies were conducted, were used (19).

The G*power 3.1.9.4 analysis program was used to calculate the sample size of this study. It was determined that at least 97 parents should participate in the sample of this study with an effect size of 0.30, a margin of error of 0.05%, df= 96 and 90% power. In total, one hundred and forty-five parents participated in this study.

This study was approved by our hospital Ethics Committee (approval number: E.K.13/24). Informed consent was obtained from all participants. Informed consent obtained from all parents who agreed to participate in the study.

Statistical Analysis

SPSS 22(SPSS Inc., Chicago, IL, USA) was used for statistical analyses. Results were expressed as percentile (absolute numbers), as mean and standard deviation, or as median and interquartile range (IQR) as required. Mann-Whitney test was used to compare the non- normally distributed continuous variables, and the independent t-test was used for normally

distributed continuous data. p<0.050 was considered statistically significant.

RESULTS

There were 145 patients in our study. Out of 145 patients, 90 (61.2%) were male. The median of the age of the children was 69 months (IQR:51-104.5). Forty-six (31.7%), 48 (33.1%), 95 (65.5%), 18 (12.4%), and 4 (2.8%) patients were diagnosed with asthma, wheezy child, allergic rhinitis, atopic dermatitis, and food allergy. Two (1.4%) patients had chronic disease, two were diagnosed as autism spectrum disorder (Table I).

Patients having symptoms of allergic diseases were 66.9% (n:97) of the patients. The common symptom was nasal congestion with a rate of 35.2 % (n:51) (Table I). In patients diagnosed with asthma, 24 (52.2 %) patients had commonly cough.

Out of the 145 patients, 107 (73.8 %) were using medication for allergic diseases. When the patients were evaluated in terms of the medicines used for allergic diseases, 75 (51.7 %), 54 (37.2%), 3 (2.1 %) and 28 (19.3 %) patients were using inhaled corticosteroid (ICS), nasal steroids, leukotriene antagonist, and oral antihistamines respectively (Table I).

Table I: Characteristics of the study population

Total Patient	145
Gender	
Male*	90 (61.2)
Female / Male	0.61
Age (months)†	69 (51-104.5)
Diagnosis of allergic diseases,*	
Allergic rhinitis	95 (65.5)
Wheezy child	48 (33.1)
Asthma	46 (31.7)
Atopic dermatitis	18 (12.4)
Food allergy	4 (2.8)
Concomitant chronic disease*	2 (1.4)
Autism	2 (1.4)
Patients not having symptoms*	48 (33.1)
Patients having symptoms*	97 (66.9)
Nasal Congestion*	51 (35.2)
Rhinorrhea	46 (31.7)
Itchiness in nose	35 (24.2)
Sneezing	32 (22.1)
Eye redness and discharge	9 (6.2)
Cough	49 (33.8)
Dyspnea	23 (15.9)
Activity limitation	12 (8.3)
Itchiness in skin	13 (9)
Rash	13 (9)
Patients using medication for allergic diseases*	107 (73.8)
Oral antihistamines	28 (19.3)
Nasal steroid	54 (37.2)
Inhaled steroid	75 (51.7)
Leukotriene antagonist	3 (2.1)

**: n(%), †: median and Interquartile Range (IQR)*

Table II: Evaluation of Sleep Disturbance Scale for Children

	Mean±SD	Min-Max
Total score	44±12.7	24-95
Disorders of initiating and maintaining sleep	13.4±4.5	7-30
Sleep Breathing Disorders	5.5±2.5	3-15
Disorders of arousal	6±2.7	3-15
Sleep-Wake Transition Disorders	9.7±4	4-27
Disorders of excessive somnolence	4.7±2.3	3-15
Sleep hyperhidrosis	4.2±2.5	2-10

Table III: Distribution of night sleeping time and falling asleep time of the children participating in this study.

Questions	n (%)
How many hours does your child sleep most nights?	
9-11 hours	61 (42.1)
8-9 hours	53 (36.6)
7-8 hours	24 (16.6)
5-7 hours	7 (4.8)
Less than 5 hours	0
How quickly does your child usually fall asleep after going to bed?	
Less than 15 minutes	63 (43.4)
Between 15-30 minutes	59 (40.7)
Between 30-45 minutes	13 (9)
Between 45-60 minutes	2 (1.4)
More than 60 minutes	8 (5.5)

'Sleep Disturbance Scale for Children' (SDSC) was applied to all parents. According to analysis, the mean of SDSC score was 44±12.7. The total SDSC score of 5 (3.4 %) children were clinically significant in terms of sleep disturbance (T-score >70). Among 5 children, three patient had asthma diagnosis, one patient had allergic rhinitis and, one had atopic dermatitis. Four patients were using medication for allergic disease. None of them had concomitant chronic disease.

The sub-dimensions of this scale were evaluated. The total of 110 (75.9 %) patients had an at least one abnormal SDSC subdimension score. The total score of DIMS were clinically significant in 9 (6.2 %) patients, SBD were in 28 (19.3 %), DA were in 97 (66.9 %), SWTD were in 18 (12.4 %), DOES were in 4 (2.8 %), and SHY were in 27 (18.6 %) patients. The mean of the 'DIMS' was 13.4±4.5. The mean of the 'SBD' was 5.5±2.5). The mean of the 'DA' was 6 ±2.7). The mean of the 'SWTD' was 9.7±4. The mean of the 'DOES' was 4.7±2.3. The mean of the 'SHY' was 4.2±2.5 (Table II).

The distributions of the children's sleeping times at night and how quickly they fell asleep after going to bed were shown in Table III. Commonly 61 (42.1 %) children were observed to sleep 9-11 hours most nights, and commonly 63 (43.4 %) children were observed to fall asleep less than 15 minutes (Table III).

There was significant statistical difference between age groups and DA score (p=0.007). Patient between 6-18 years age tended to have higher mean score of DA. There was no

Table IV: Comparison of children's sleep disturbance scale for children and subscale score averages according to the descriptive characteristics of patients

Variable	DIMS*	p†	SBD*	p†	DA*	p†	SWTD*	p†	DOES*	p†	SHY*	p†	Total*	p†
Age														
3-6 age	13±4.4	0.376	4.5±2.3	0.166	5±2.3	0.007†	8.5±3.5	0.255	4±2.2	0.355	4±2.6	0.414	43.5±11.4	0.838
6-18 age	13±4.6		5±2.6		6±3		10±4.5		4±2.5		3±2.5		42±13.9	
Gender														
Female	14±4.5	0.608	5±2.7	0.891	5±2.9	0.966	9±4.2	0.895	4±2.7	0.848	3±2.5	0.443	44±14.6	0.676
Male	12±4.5		5±2.3		5.5±2.6		9±3.9		4±2.1		4±2.6		42±11.4	
Diagnosıs of Allergic Diseases														
Wheezy child	13±3.8	0.334	5±2.1	0.756	5±2.4	0.187	9±3.7	0.557	5±2	0.418	4.5±2.6	0.009	44.5±9.9	0.405
Asthma	13±4.1	0.631	5±2.4	0.183	6±2.8	0.129	9±4	0.829	3.5±2.2	0.102	4±2.4	0.655	42±12.4	0.985
Allergic rhinitis	13.9±4.6	0.050	5.5±2.4	0.956	6.1±2.8	0.676	9.7±4	0.872	4.5±2	0.720	4.2±2.6	0.460	44±12.2	0.800
Atopic dermatitis	12.6±5.2	0.193	5.5±2.9	0.525	5.7±3	0.460	10±4.3	0.818	5.5±3.1	0.283	3.8±2.1	0.748	45±16	0.931
Symptoms of Allergic Diseases														
Patients not having symptom	12.6±3.9	0.117	5.1±2.2	0.232	5.2±23.	0.020	9.3±4.1	0.087	4.4±2.1	0.242	3.8±2	0.411	40.7±11.9	0.014
Patients having symptom	13.8±4.7		5.7±2.6		6.4±2.9		9.9±3.9		4.8±2.4		4.4±2.7		45.7±12.8	
Nose congestion	15±5.2	0.010	6±2.6	0.032	6.7±3.2	0.090	10.3±4.3	0.177	4.9±2.3	0.422	4.7±2.8	0.292	47.8±12.8	0.009
Runny nose	14.9±5.1	0.021	6.1±2.7	0.053	6.8±3.2	0.086	10.5±4.4	0.086	4.8±2.3	0.843	4.6±2.8	0.455	47.5±13.3	0.050
Itchiness in nose	14.6±4.2	0.036	5.8±3.1	0.775	6.4±3	0.555	10±3.6	0.226	4.6±1.8	0.907	4.6±2.9	0.586	46.6±13.1	0.239
Sneeze	14.4±4	0.076	5.8±3	0.935	6.5±3.1	0.572	10.2±4	0.255	4.5±1.7	0.775	5.1±3	0.077	47±13	0.190
Eye symptom	14.1±4.1	0.476	7±3.6	0.147	7.6±4	0.248	12±4.4	0.044	4.7±1.3	0.429	6.5±2.9	0.013	51.5±15.9	0.175
Cough	14.3±4.3	0.034	6±2.5	0.037	6.7±2.8	0.035	10.3±3.8	0.030	4.7±2.5	0.734	4.5±2.6	0.390	47±12.5	0.033
Dyspnea	13.6±4.6	0.929	6.8±2.7	0.010	6.2±3	0.975	10.7±4.7	0.205	5.1±3.1	0.949	4.9±3	0.398	47.7±15.11	0.245
Activity limitation	15.6±4.8	0.084	7.9±2.9	0.003	7±3.7	0.464	12.2±5.8	0.061	5.5±3.5	0.754	6.2±3.2	0.032	54.3±16.2	0.012
Itchiness in skin	11.6±4.2	0.064	4.8±2.1	0.256	5.3±2.2	0.331	9±2.2	0.833	4.6±2.1	0.705	4.3±2.8	0.964	42.3±11.2	0.527
Rash	11.5±4.2	0.045†	4.9±2.1	0.366	5.3±2.1	0.276	8.9±2.2	0.691	4.6±2.1	0.944	4.2±2.8	0.829	41.9±11.3	0.416
Patients Given Treatment For Allergic Diseases														
Patients not given treatment	13.5±4.7	0.975	5.3±2.6	0.377	6±2.5	0.708	8.9±2.6	0.430	4.6±2.6	0.311	4±2.5	0.536	43.7±12.3	0.862
Patients given treatment	13.4±4.4		5.5±2.4		6±2.8		10±4.4		4.7±2.2		4.3±2.6		44.2±12.8	
Oral antihistamine	14.5±5.4	0.225	6±3.1	0.620	7.5±3.4	0.009	11.4±3.9	0.002	5.7±2.6	0.002	4.3±2.8	0.918	49.8±15.1	0.020
Nasal steroid	13.5±4	0.475	5.7±2.5	0.233	6.2±2.9	0.585	9.8±4.3	0.869	4.6±1.8	0.410	4.1±2.6	0.421	44±11.3	0.793
İnhaled steroid	13±3.8	0.773	5.4±2.1	0.626	5.6±2.5	0.111	9.8±4.2	0.823	4.6±2.1	0.739	4.6±2.5	0.024	43.3±11.4	0.739
Leukotriene antagonist	16.6±3.7	0.123	6.6±2.3	0.293	7.6±3.7	0.343	9.6±2.5	0.669	3.3±0.5	0.215	6±3.4	0.215	48.6±10.2	0.408

:** *mean±SD*, **†:** *Mann-Whitney U test*, ***DIMS: *Disorders of initiating and maintaining sleep*, ***SBD:*** *Sleep Breathing Disorders*, ***DA:*** *Disorders of arousal*, ***SWTD:*** *Sleep-Wake Transition Disorders*, ***DOES:*** *Disorders of excessive somnolence*, ***SHY:*** *Sleep Hyperhidrosis*

significant statistical difference between gender, and SDSC total score and subdimensions score (Table IV).

There was significant statistical difference between having symptom of allergic diseases and SDSC total mean score (p=0.014). Patients diagnosed wheezy child tended to have higher mean score of SHY (p=0.009). There was no significant statistical difference between having asthma, AR, and atopic dermatitis, and subdimensions mean scores (Table IV).

Among patients having symptoms, there was significant statistical difference between SDSC total mean score, and having nose congestion, cough, and activity limitation (p=0.009, 0.033, and 0.012 respectively). Patients having allergic symptom tended to have higher mean score of DA (p=0.020). Patients having nose congestion tended to have higher mean scores of DIMS and SBD (p=0.010, and 0.032 respectively). Patients having runny nose tended to have higher mean scores of DIMS (p=0.021). Patients having itchiness in the nose tended to have higher mean scores of DIMS (p=0.036). Patients having eye symptom tended to have higher mean scores of SWTD and SHY (p=0.044, and 0.013 respectively). Patients having cough tended to have higher mean scores of DIMS, SBD, DA, and SWTD (p=0.034, 0.037, 0.035, and 0.030 respectively). Patients having dyspnea tended to have higher mean scores of SBD (p=0.010). Patients having activity limitation tended to have higher mean scores of SBD and SHY (p=0.003, and 0.032 respectively). Patients having rash tended to have higher mean scores of DIMS (p=0.045). (Table IV).

There was significant statistical difference between SDSC total score and patients using oral antihistamine treatment (p=0.020). Patients using oral antihistamine treatment tended to have higher mean scores of DA, SWTD, and DOES (p=0.009, 0.002, and 0.002 respectively). Patients using ICS treatment tended to have higher mean scores of SHY (p=0.024) (Table IV).

DISCUSSION

In this study, 5 (3.4 %) of 145 patients had clinically significant SDSC score. There was statistically significant difference in SDSC scores between having or not having symptom of allergic diseases. Patients diagnosed wheezy child tended to have higher mean score of SHY. Among patients having symptoms of allergic diseases, there was statistically significant difference in SDSC score between having nose congestion, cough, and activity limitation and not having these symptoms. Patients using oral antihistamine treatment tended to have higher total mean scores of SDSC.

Causes of sleep disorder in patients having allergic disease may be due to increase in symptoms of the underlying disease, such as cough in asthma, runny nose, congestion and postnasal drip in allergic rhinitis; increase in itching sensation at night in patients with atopic dermatitis; failure to comply with treatment recommendations that causes an increase in symptoms. These factors can lead disrupting sleep, and cause daytime sleepiness, fatigue, decrease in cognitive and psychomotor abilities, and increase difficulty in concentration (11).

According to Sherrey et al. (21), it was observed that allergic rhinitis was associated with sleep routine problems, morning tiredness, night arousals, sleep disordered breathing and restless sleep; asthma with sleep routine problems, sleep disordered breathing and restless sleep; and eczema with restless sleep (21). In another study, children having poorer asthma and allergic rhinitis had higher levels of sleep problems (22). According to Ma et al., out of 4876 preschool children, it was observed that frequent nocturnal awakening was statistically higher in children diagnosed with asthma and allergic rhinitis (13).

In a meta-analysis, sleep disorders are associated with an increased prevalence and incidence of asthma (23). In another study, it was observed that asthmatic children reported increased nocturnal symptoms, sleep disturbances and poorer sleep quality (24). In our study, patients diagnosed wheezy child tended to have higher mean score of SHY (p=0.009). There was no statistically significant difference in SDSC score between having asthma diagnosis and not. According to Furtado et al., a better quality of life was observed in children with lower SDSC total score and lower levels of dyspnea (25). In our study, patients having dyspnea tended to have higher mean scores of SBD (p=0.010).

According to Loekmanwidjaja et al. (26), it was observed that children with moderate to severe persistent allergic rhinitis had a higher frequency of sleep disorders than healthy controls, particularly concerning nocturnal breathing disorders, daytime sleepiness, and parasomnias. However, patients having nose congestion, runny nose, and itchiness in the nose tended to have higher mean scores of DIMS. Patients having eye symptom tended to have higher mean scores of SWTD and SHY.

Atopic dermatitis (AD) is associated with sleep disturbances in 47% to 80% of children (27). According to Ramirez et al. (28), children with mild atopic dermatitis or inactive atopic dermatitis had significantly more impaired sleep quality than healthy children. Children with active AD, reported worse sleep quality, and patients having concomitant allergic rhinitis and/or asthma had worse sleep quality (28). In our study, there was no statistically significant difference between having atopic dermatitis and not in terms of SDSC total and subdimensions' mean score. However, patients having rash tended to have higher mean scores of DIMS.

CONCLUSION

In this study, out of 145 patients, 5 (3.4 %) patients had clinically significant SDSC score. Patients having symptom of allergic diseases tended to have higher total mean score of childrens' sleep disturbance scale. Patients diagnosed wheezy

child tended to have higher mean score of SHY. Patients having nose congestion, cough, and activity limitation tended to have higher total mean score of SDSC.

Physicians should pay particular attention to sleep quality in children with allergic diseases. It is recommended that further studies be carried out to identify sleep disorders and affecting factors and to improve these conditions, and to provide education and consultancy services to parents on these issues.

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Mothers' Perspectives on Childhood Vaccination Programmes after the COVID-19 Pandemic and Subsequent News/Rumours About Vaccination

Annelerin COVİD-19 Salgını ve Aşılamayla İlgili Haberler/Söylentiler Sonrası Çocukluk Çağı Aşılama Programlarına Bakış Açıları

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ABSTRACT

Objective: Vaccine hesitation in parents against the childhood vaccination is an important public health problem that affects the whole society, especially children. In this study, we aimed to evaluate vaccine hesitancy in mothers after COVID-19.

Material and Methods: The study consisted of a total 161 mothers who applied to the pediatric outpatient clinics of the Aksaray University Hospital between February and August 2023 for the follow-up of healthy children aged 0-2 years. Sociodemographic information was obtained through a questionnaire and the vaccine hesitancy scale (VHS) was used in the study.

Results: A total 75.8% of mothers considered the routine childhood vaccination programme safe. The rate of negatively affected by vaccine news/rumours after COVID-19 infection/pandemic was 23% in the hesitant group, while this rate was 2.5% in the safe group (p<0.001). The VHS score was found to be higher in the group (22.5±4.96) affected by vaccine news/rumours compared to unaffected group (17.3±3.99) (p<0.001). The VHS score of the mothers who found childhood routine vaccination safe (19.02±4.45) was lower than the hesitant group (25.41±4.66) (p<0.001). We found that the VHS scores of mothers with high school education or above (21.39±5.19) were higher than the other group (19.39±4.59) (p=0.014).

Conclusion: Mothers can be affected by news/rumours and posts on social media, and therefore parents need to be aware of digital parenting and health literacy. Mothers with higher levels of education do more research on vaccination and may be more hesitant about childhood vaccination. For mothers who are trying to make the most accurate and appropriate decision for their children, the most accurate information about early vaccination/disease should be provided from all health professionals, especially pediatricians.

Key Words: Childhood, COVID-19 vaccination, Immunisation, Social media, Vaccine hesitancy

ÖZ

Amaç: Ebeveynlerin çocukluk çağı aşılarına karşı aşı tereddütleri, başta çocuklar olmak üzere tüm toplumu etkileyen önemli bir halk sağlığı sorunudur. Bu çalışmada, COVİD-19 sonrası annelerde aşı tereddütünü değerlendirmeyi amaçladık.

Gereç ve Yöntemler: Çalışmaya Şubat-Ağustos 2023 tarihleri arasında Aksaray Üniversite Hastanesi pediatri polikliniklerine 0-2 yaş arası sağlıklı çocuklarının takibi için başvuran toplam 161 anne dahil edildi. Sosyodemografik bilgiler bir anket aracılığıyla elde edildi ve çalışmada aşı tereddüt ölçeği kullanıldı.

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Ethics Committee Approval / *Etik Kurul Onayı*: This study was conducted in accordance with the Helsinki Declaration Principles. Mothers were informed before the study and ethical permission was obtained with the decision numbered 2023/02-06- 12-SBKAEK of Aksaray Clinical Research Ethics Committee.

Contribution of the Authors / Yazarların katkısı: DEMİRTAŞ MS: Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***YAMAN ARTUNÇ N:*** Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study.

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Bulgular: Annelerin %75.8'i rutin çocukluk çağı aşılama programını güvenli buldu. COVİD-19 enfeksiyonu/pandemisi sonrası aşı haberlerinden/söylentilerinden olumsuz etkilenme oranı kararsız grupta %23 iken, bu oran güvenli grupta %2.5'ti (p<0.001). Aşı tereddüt ölçeği puanı aşı haberlerinden/söylentilerinden etkilenen grupta (22.5±4.96), etkilenmeye gruba (17.3±3.99) göre daha yüksek bulunmuştur (p<0.001). Çocukluk çağı rutin aşılamalarını güvenli bulan ebeveynlerin aşı kararsızlık ölçeği puanı (19.02±4.45) kararsız gruptan (25.41±4.66) daha düşüktü (p<0.001). Lise ve üzeri eğitime sahip annelerin aşı kararsızlık ölçek puanları (21.39±5.19) diğer gruptan (19.39±4.59) daha yüksek olduğu bulunmuştur (p=0.014).

Sonuç: Anneler sosyal medyadaki haber/söylenti ve paylaşımlardan etkilenebilmektedir ve bu nedenle ebeveynlerin dijital ebeveynlik ve sağlık okuryazarlığı konusunda bilinçli olmaları gerekmektedir. Eğitim düzeyi daha yüksek olan anneler aşılama konusunda daha fazla araştırma yapmakta ve çocukluk aşıları konusunda daha tereddütlü olabilmektedir. Çocukları için en doğru ve uygun kararı vermeye çalışan anneler için erken aşılama/hastalık konusunda en doğru bilgi başta pediatristler olmak üzere tüm sağlık profesyonellerinden sağlanmalıdır.

Anahtar Sözcükler: Çocukluk çağı, COVİD-19 aşılaması, Aşılama, Sosyal media, Aşı tereddütü

INTRODUCTION

SARS-CoV-2 coronavirus (COVID-19) infection has caused a pandemic, and the high mortality and morbidity rates have led to serious precautions such as lockdown and social isolation (1). Following the initiation and use of different types of vaccine studies in many countries in order to prevent the disease, discussions on the content and quality of vaccines have also developed. Speculative, misleading and misinformative news on social media and the internet without specifying the source have been effective in the spread of these concepts (2, 3). The spread of such news and the interactions of anti-vaccinationists on social media have led to an increase in vaccine hesitancy among the public and parents, which was identified by WHO as one of the top 10 problems posing a threat to global health in 2019 (4-6). With the debate against COVID-19 infection/vaccine, hesitation in childhood vaccines has increased among parents. This situation has become an important public health problem that may affect the whole society, especially unvaccinated children, against morbid and mortality diseases of childhood that can be prevented by vaccination (5, 7).

In this study, we aimed to investigate the vaccine hesitancy in childhood vaccination, which is an important public health problem and has increased among parents, more prominently after COVID-19 infection/vaccination.

MATERIAL and METHODS

This study was conducted as a cross-sectional and descriptive study.

The sample of the study consisted of a total of 161 mothers who applied to the Pediatric Outpatient Clinics at Aksaray University Training and Research Hospital in Turkey between February and August 2023 for healthy child follow-up aged 0-2 years.

Mothers of children with chronic diseases, premature infants, and children who were hospitalised due to infection/health problems were not included to study. A total of 161 out of 263 invited mothers whose child was aged 0-2 years who enrolled during the 6-month period and met the inclusion criteria participated in the study.

In the study, data were collected with a questionnaire consisting of 16 questions in total. The questionnaire was conducted face-to-face with the mothers at the time of their application to the outpatient clinic.

The questionnaire consisted of two parts. In the first part, infant's age (months), mother's and father's age and childbirth order were asked. Education level of parents was evaluated as primary, secondary, high school and university and above. In the second part of the questionnaire, mothers were asked about the routine childhood vaccination programme, COVID-19 and their vaccination ideas. Childhood vaccination information of the infant, and information about COVID-19 vaccination were asked. In addition, mothers were asked whether they were affected by social media news/rumours about vaccines about COVID-19 and vaccine-related information on social media platforms (such as Twitter, Facebook, Instagram) that today's users frequently use.

The Turkish version of the "Vaccine Hesitancy Scale" (VHS) developed by Shapiro et al. (9) was used in our study (8). The VHS is a scale consisting of 9 questions in total, each question can be answered as "strongly disagree, disagree, undecided, agree and strongly agree" and can be scored between 1-5. After the questionnaire, the VHS was scored between 9-45 points. After scoring the VHS according to a special scoring system, vaccine hesitancy is found to be higher in those with higher scores.

Mothers were informed before the study and ethical permission was obtained with the decision numbered 2023/02-06-12-SBKAEK of Aksaray Clinical Research Ethics Committee.

Statistical Analyses

In the current study, the data was analysed IBM Statistical Package for the Social Sciences, version 24.0 (SPSS Inc., Armonk, NY, IBM Corp., USA). The Shapiro–Wilk test was performed to determine the distribution patterns of the variables. Categorical variables were presented as number or percentages. The student's t test was used to compare continuous variables between VHS and affected and unaffected from vaccine news; and first birth and other births groups; education levels of parents; infant/mother/parent's age as appropriate. The Chi-square test was used in group comparisons of nominal variables. A p value of less than 0.05 was considered as statistically significant.

RESULTS

A total of 161 mothers with children aged 0-2 years were included in the study. The mean age of the infants was 7.4± 1.01 months, and the mean age of the mothers was 29.8±4.3 years. Of the infants, 26.1% (n=42) were 0-5 months, 33.5% (n=54) were 6-11 months, 25.5% (n=41) were 12-17 months and 14.9% were 18-24 months. Among the infants included in the study, 28% (n=45) were the first, 35.3% (n=57) were the second, and 23% (n=37) were the third infants. While 21.1% (n=34) of the mothers were university graduates and 39.1% (n=63) were high school graduates, these rates were 19.9% (n=32) and 39.1% (n=63) for the fathers, respectively. Other sociodemographic data in the study are summarised in Table I.

Childhood immunisations of 96.9% (n=156) of the infants in the study were complete according to their age. Among the parents who participated in the study, 75.8% (n=122) answered that childhood immunisations were safe, 21.1% (n=34) answered that they were undecided but had them, and 1.2% (n=2) answered that they were not safe and did not have them (Table II).

After the COVID-19 infection, 6.8% (n=11) of the mothers stated that they were negatively affected, 24.3% (n=39) were unhesitant. Of the participants, 30.4% (n=49) stated that they were negatively affected, 32.3% (n=52) were hesitant, and 37.3% (n=60) were unaffected by the COVID-19 vaccine news (Table II).

Mothers stated that 16.1% (n=26) of the vaccine news on social media contained false propaganda, 16.8% (n=27) created information pollution, 11.8% (n=19) provided false and misleading information, 21.1% (n=34) presented information

Table I: Demographic Feature of Participants

Demographic Feature	
Infant's age (months)*	
0-5	42 (26.1)
6-11	54 (33.5)
12-17	41 (25.5)
18-24	24 (14.9)
Birth Order*	
1st	45 (28)
2nd	57 (35.4)
3rd	37 (23)
4th	19 (11.8)
≥5th	3 (1.9)
Mother's Age*	
18-22	23 (14.3)
23-27	41 (25.5)
28-32	51 (31.7)
33-37	39 (24.2)
≥38	7 (4.3)
Father's Age*	
18-22	17 (10.6)
23-27	29 (18)
28-32	54 (33.5)
33-37	41 (25.5)
≥38	20 (12.4)
Mother's Education*	
Primary*	26 (16.2)
Secondary	38 (23.6)
High School	63 (39.1)
University and more	34 (21.1)
Father's Education*	
Primary	28 (17.4)
Secondary	38 (23.6)
High School	63 (39.1)
University and more	32 (19.9)
Features†	
Infant's age	7.4±1 (1-23)
Mother's age	29.8±4.3 (18-45)
Father's age	34.6±5.4 (19-49)

:** *n(%),* **†:** *Mean ± SD (Min-Max),* ***Primary: *Combined with primary, dropout and no education.*

Table II: Mothers' opinions about vaccination

Feature	
Vaccine Schedule Complete*	
Yes	156 (96.9)
No	5 (3.1)
Childhood Vaccinations*	
Safe	122 (75.8)
Hesitancy	34 (21.1)
Not safety, mandatory	3 (1.9)
Not safety, Refuse	2 (1.2)
After Covid-19 infection and vaccination, has your opinion changed about previous childhood vaccinations?*	
No, it hasn't changed	111 (68.9)
Yes, I have a negative opinion about vaccinations.	11 (6.8)
Yes, vaccine hesitation occurred	39 (24.3)
Have you been affected by social media news/ rumours about vaccines after COVID-19?*	
Yes, my opinion about vaccinations has been negatively affected.	49 (30.4)
Yes, I have become hesitant about vaccinations.	52 (32.3)
No, I was not affected	60 (37.3)
How do you evaluate the news about childhood vaccinations by independent sources on social media?*	
They provide the public with untold information about vaccinations.	34 (21.1)
They are making false propaganda.	26 (16.1)
I think that they direct the public in a negative direction with false/misleading news about vaccines	19 (11.8)
They create information pollution without citing sources.	27 (16.8)
They mislead the public with false and biased sources.	30 (18.6)
They convey the truth to the public as an alternative to the one-sided information created by pharmaceutical/vaccine companies	25 (15.5)

***:** *n(%), Childhood immunisations were carried out in accordance with the age of the previous or current child*

Table III: Evaluation of the mothers' opinion about childhood vaccination programs.

Feature	Safe* 122 (75.8)	Not Safe*‡ 39 (24.2)	p
Vaccination News/rumours			
Affected	28 (23)	21 (53.8)	0.001
Hesitancy	41 (33.6)	11 (28.2)	
Not affected	53 (43.4)	7 (17.9)	
Birth Order			
1st	30 (24.6)	15 (38.5)	0.070
2nd and more ß	92 (75.4)	24 (61.5)	
Vaccine Opinion†			
Negative	3 (2.5)	8 (20.5)	<0.001
Hesitancy	21 (17.2)	18 (46.2)	
Not affected	98 (80.3)	13 (33.3)	
Infant's age			
<12 month	74 (77.1)	22 (22.9)	0.638
≥12 month	48 (73.8)	17 (26.2)	
Mother's age			
<33 year	89 (77.4)	26 (22.6)	0.450
≥33 year	33 (71.7)	13 (28.3)	
Father's age			
<33 year	74 (76.3)	23 (23.7)	0.852
≥33 year	48 (75.0)	16 (25.0)	
Mother's Education			
8 years of education and below	54 (78.1)	10 (21.9)	0.572
High school and above	68 (74.2)	29 (25.8)	
Father's Education			
8 years of education and below	70 (73.7)	25 (26.3)	0.457
High school and above	52 (78.8)	14 (21.2)	

:** *n(%),* **†:** *After COVID-19 infection/vaccination,* **‡Combined with vaccine hesitancy and negative impacted,* **ß:** *Combined with 2, 3, 4, 5 and more*

that was not told to the public, and 15.5% (n=25) presented alternative and different information that was not provided by pharmaceutical/vaccine companies (Table II).

No significant results were found when the age of the mothers, the birth order of infants, and maternal education level were compared with the status of being affected by vaccination news (p=0.398, p=0.283, p=0.316, respectively).

When childhood routine vaccination was compared with the change of opinion after COVID-19, 80.3% of those who considered childhood routine vaccination safe stated that their opinions were not affected and 2.5% stated that their opinions were negatively affected, while these rates were 33.3% and 20.5%, respectively, in the undecided group (p<0.001). Likewise, when compared with vaccination news, 43.4% of the mothers who considered vaccination safe were not affected by vaccination news and 23% were negatively affected, while this rate was found to be 17.9% and 53.8% in the undecided group (p=0.001) (Table III).

The VHS score in the study was 20.57±5.27 (Table IV). When the VHS score was compared between the group affected and unaffected by vaccine news, the vaccine scale score was found to be 22.5±4.96 in the group affected by vaccine news/rumours, while the scale score was found to be 17.3±3.99 in the unaffected group (p<0.001). When mothers with the first child and parents with 2 or more children were compared, the VHS score was found to be 21.24±6.03 and 20.3±4.93, respectively (p=0.313) (Table V).

There were no significant differences between the groups when VHS scores were compared according to maternal, paternal

Table IV: Vaccine Hesitancy Scale

Vaccine Hesitancy Scale	Strongly Disagree*	Disagree*	Hesitant*	I agree*	Absolutely I agree*
1. Childhood vaccinations are important for my child's health	0 (0)	0 (0)	20 (12.4)	70 (43.5)	71 (44.1)
2. Childhood vaccines are effective	0 (0)	1 (0.6)	22 (13.7)	60 (37.3)	78 (48.4)
3. Having my child vaccinated is important for the health of others in my community	1 (0.6)	2 (1.2)	31 (19.3)	56 (34.8)	71 (44.1)
4. All childhood vaccines offered by the government to our society are beneficial.	0 (0)	4 (2.5)	52 (32.3)	42 (26.1)	63 (39.1)
5. New vaccines carry more risk than old vaccines.	6 (3.7)	8 (5)	43 (26.7)	40 (24.8)	64 (39.8)
6. The information I have received about vaccines from the vaccination programme is reliable and trustworthy.	0 (0)	10 (6.2)	49 (30.4)	51 (31.7)	51 (31.7)
7. Vaccination is a good way to protect my children from diseases.	0 (0)	1 (0.6)	25 (15.5)	77 (47.8)	58 (36)
8. I usually do what my doctor or other health professionals (midwife, nurse, etc.) recommend for my children about vaccines.	0 (0)	7 (4.3)	27 (16.8)	81 (50.3)	45 (28)
9. I am concerned about serious side effects of vaccines	67 (41.6)	42 (26.1)	36 (22.4)	9 (5.6)	6 (3.7)
Feature					
Vaccine Hesitancy Score†	20.57 ± 5.27 (9-31)				

***:** *n(%),* **†:** *mean ±SD (Min-Max)*

Table V: Evaluation of the vaccine hesitancy scale score in groups.

Feature	Number	Mean ± SD	t	df	p*
Vaccine news/rumours					
Affected†	101	22.50±4.96	6.92	144.85	<0.001
Not affected	60	17.30±3.99			
Opinion on Childhood Vaccination					
Safe	122	19.02±4.45	-7.7	61.67	<0.001
Not Safe†	39	25.41±4.66			
Birth Order ß					
1	45	21.24±6.03	1.01	68.05	0.313
Multiple birth order ß	116	20.30±4.93			
Infant's age					
<12 month	96	20.08±5.09	-1.44	131.05	0.154
≥12 month	65	21.29±5.45			
Mother's age					
<33 year	115	20.10±5.11	-1.80	77.82	0.075
≥33 year	46	21.74±5.50			
Father's age					
<33 year	97	20.48±5.03	-0.29	124.35	0.774
≥33 year	64	20.72±5.62			
Mother's Education					
≤8 years‡	64	19.39±4.59	2.47	145.52	0.014
≥High school§	97	21.39±5.19			
Father's Education					
≤8 years‡	66	19.95±5.58	1.38	118.42	0.170
≥High school§	95	21.04±4.42			

**: Student t-test, †: Vaccine hesitancy and negative impacted were combined ‡: 8 years of education and below were combined, §: High school and university graduates combined, ß: 2,3,4,5 and more birth order were combined*

and infant age (p=0.075, p=0.774, p=0.154, respectively). When mothers who were hesitant about routine childhood vaccination and those who did not find it safe were formed into a group and compared, the scale score of the parents who thought it was safe was 19.02±4.45, while this score was 25.41±4.66 in the other group (p<0.001). When maternal and paternal education level was compared with high school and above and others, VHS scores were not different in the paternal group (p=0.170), whereas in the maternal group, a significant difference was found in favour of higher hesitancy for the group with high school and above (21.39±5.19 vs 19.39±4.59) education (p=0.014) (Table V).

DISCUSSION

Vaccine hesitancy means delaying vaccination or accepting that the vaccine will work but hesitating to vaccinate (10). It is possible to say that digital platforms play an important role in the rise of vaccine hesitancy, and that the anti-vaccine discourses that individuals encounter in the digital environment have a significant effect on vaccine hesitancy (11, 12). The lack of a scientific standard for posting/sharing health information in digital media and the fact that the information in these media can be easily changed, distorted or created anonymously with misleading statements cause a lot of inaccurate content and even various conspiracy theories about vaccination to spread rapidly among users (13, 14). Parents, who make the final decision in providing the most accurate and best health service for their children, often prefer social media due to its easy accessibility in obtaining information (15). Anti-vaccination campaigns that are encountered within the scope of digital parenting increase the risk perception of vaccines in parents, and this situation results in parents refusing or delaying vaccination (16, 17). In this study, we found that the percentage of being affected by vaccine news/rumours after COVID-19 was 53% and the VHS score (22.5±4.96) was higher in mothers who were hesitant about childhood vaccination compared to the other group (p = 0.001, p<0.001, respectively). This result shows us that mothers can be affected by news and posts on social media. Therefore, parents should be aware of digital parenting and health literacy.

In studies on vaccine hesitancy/refusal and parental education levels, there are different studies showing that vaccine hesitancy/refusal increases with decreasing and increasing education levels of mothers (18-22). Opel et al. (23) In their study conducted in the USA, it was reported that vaccine hesitancy increased 3.72 times in mothers with a higher level of education, and similarly, in the study conducted by Facciola et al. (24) in Italy, it was reported that vaccine hesitancy was higher in mothers with a higher level of education. In our study, we found no difference between the level of maternal education and trust in the routine childhood vaccination programme (p=0.572), but we found that VHS score was higher in mothers with high school and above education (p=0.014). This result made us think that mothers with a higher level of education

did more research on vaccines and had more hesitations about most childhood vaccines with the information they obtained from different information sources they encountered.

The effect of parental age on childhood vaccination programme varies. Experience and expertise play a role in this, as well as the influence of parents on social media and news (25, 26). In a large-scale study conducted in sub-Saharan Africa, it was shown that vaccination hesitancy increased by 5% for every 1-year decrease in maternal age (27). In a vaccine hesitancy study conducted in Turkey, it was shown that vaccine hesitancy was higher in mothers aged 18-30 years compared to mothers aged 31-40 years (28). In a study on routine childhood vaccination conducted in India, it was found that maternal age did not show any effectiveness between 19-25 years and 26-35 years and above 35 years (29). In our study, although we determined that the VHS score of the <33 age group was lower than the other group, we found that maternal age had no effect on vaccine hesitancy (p=0.075).

Childhood vaccination aims to prevent morbid and mortal diseases in the childhood age group and to protect not only the vaccinated children but also the whole society with herd immunity (30). In this context, each country has its own childhood vaccination programmes, and vaccination programmes are revised according to regional and national health conditions (31, 32). According to the 2008-2013 and 2018 Turkey Demographic and Health Survey (TDHS) data, there is a remarkable decrease in the age-appropriate vaccination rate between 12-23 months in our country (77%, 74% and 67%, respectively) (33). Parents' attitudes, experiences and knowledge about vaccination, as well as their attitudes and concerns about vaccine safety, are all influential in determining whether or not a child should be vaccinated (34,35). Families' experiences and knowledge of childhood illnesses influence parents' attitudes towards vaccine-preventable diseases and their perceptions of the likelihood of their children being affected (35). In our study, we found that the rate of being affected by COVID-19 vaccine news/rumours was significantly lower in those who considered childhood vaccination safe (2.5%) compared to the undecided/hesitant group (23%) (p<0.001). This result may be related to that mothers who have knowledge and confidence about diseases and vaccination are less affected by the news.

Strength and Limitations

Our study is an important study in the field of vaccine hesitancy, which is a basic public health issue and increased after COVID-19, and we consider it as a pioneering study for cohort studies. One of the limitations of our study was that it did not start before the COVID-19 pandemic and was not conducted as a cohort study with the same participants longitudinally until the end of the pandemic. Other limitations were that it was not a multicentre study and the number of volunteer participants was not high.

CONCLUSION

Vaccination for vaccine-preventable diseases in childhood also shows that mothers are affected by news/rumours reports in social media that are not based on basic scientific basis. The fact that we found that mothers who have knowledge about vaccine/disease and trust the vaccination programme are less affected by the news and have lower vaccine hesitancy scale scores shows us that mothers should be informed about vaccine/disease in the early period of childhood. It is revealed that mothers with higher levels of education do more research on vaccination and have more hesitations on this issue, therefore, it is necessary to answer the hesitations/questions of families about vaccination during routine child visits and to inform families more about the vaccines administered. For mothers who are trying to make the most accurate and appropriate decision for their children, the most accurate information about vaccination/disease in the early period should be provided by all healthcare professionals, especially pediatricians.

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Evaluation of Secondary Dyslipidemia in Obese Children

Obez Çocuklarda Sekonder Dislipidemi Sıklığının Araştırılması

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ABSTRACT

Objective: This study was conducted to determine the frequency of dyslipidemia secondary to childhood obesity, a recently emerging clinical entity, and to compare serum lipid profiles in obese and non-obese children.

Material and Methods: After screening children with an obese appearance, a group of 119 obese children aged between 2 to 16 years with a body mass index above the 95th percentile and a control group of 124 children in a similar age range were compared in terms of serum lipid profile.

Results: An abnormal lipid profile was determined in 62.6% of obese children, and serum levels of total cholesterol and triglycerides were higher in this group. It was found that Childhood obesity was associated with higher levels of total cholesterol (44.5%), triglycerides (48.7%), LDL (38.7%), and lower levels of HDL (23.5%).

Conclusion: Obese children have a higher risk of secondary dyslipidemia and associated comorbidities. In order to prevent childhood obesity and its dangerous consequences, effective measures must be implemented in terms of screening, early diagnosis and appropriate treatment.

Key Words: Childhood, Dyslipidemia, Obesity

ÖZ

Amaç: Bu çalışma, çocukluk çağı obezitesine sekonder gelişen dislipideminin sıklığını belirlemek ve obez çocuklarla obez olmayan çocukların lipid profillerini karşılaştırmak amacıyla yapılmıştır.

Gereç ve Yöntemler: Obez görünümlü çocuklar taranarak saptanan, yaş aralığı 2-16 arasında ve vücut kitle indeksi 95. persentil eğrisi üzerinde olan 119 obez olgudan oluşan grup ve benzer yaş aralığındaki 124 olgudan oluşan kontrol grubu, serum lipid profili bakımından karşılaştırılmıştır.

Bulgular: Bulgularımıza göre anormal lipid profili obez çocuklarda %62.6 oranında saptandı ve total kolesterol ile trigliserid düzeyleri kontrol grubuna göre daha yüksekti. Çocuklarda obezite, total kolesterol yüksekliği (%44.5), trigliserid yüksekliği (%48.7), LDL yüksekliği (%38.7) ve HDL düşüklüğü (%23.5) ile ilişkili bulundu.

Sonuç: Obez çocuklar sekonder dislipidemi ve ilişkili hastalıklar açısından risk altındadır. Obezite ve dislipideminin komplikasyonlarını önlemek amacıyla çocukluk çağı obezitesine yönelik tarama, erken teşhis ve uygun tedavinin başlanması önem taşımaktadır.

Anahtar Sözcükler: Çocukluk çağı, Dislipidemi, Obezite

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Contribution of the Authors / Yazarların katkısı*: *ÇAKMAKCI S: Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***YILDIZ F:*** Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the conclusions, Organizing, supervising the course of progress and taking the responsibility of the research/study, Taking responsibility in logical interpretation and conclusion of the results, Reviewing the article before submission scientifically besides spelling and grammar.

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INTRODUCTION

The increasing frequency of pediatric obesity is an increasing public health problem, and is gradually becoming more explicit due to the decreasing engagement of children in physical activity, the changes in life circumstances and the lack of knowledge of the need to address obesity by both families and physicians (1).

The diagnosis of childhood obesity is based on body mass index (BMI, calculated as weight (kg)/height (m^2)). BMI percentile curves prepared based on age and sex identify those between 85th and 95th percentile as overweight, and those above the 95th percentile as obese. Associations have been reported between obesity and cardiovascular system diseases, hypertension, degenerative arthritis and type-2 diabetes in all age groups. Furthermore, obesity in adulthood has been associated with the individual's childhood status, and the mean lifetime in such people is shorter. It is important to screen for the degree of obesity, for comorbidities associated with family history and for other risk factors (2).

A study conducted in the United States reported that the prevalence of obesity in children and adolescents was 16% (2). The prevalence of childhood obesity in Türkiye has increased two-fold and three-fold in children aged 6–11 years and 12–17 years, respectively, since 1980 (2). Obesity, has become a significant health problem in Türkiye, especially among children residing in urban areas. The prevalence of obesity among children aged 6–11 year of parents with a high socioeconomic level was reported to be 30.2% in a study conducted in Istanbul between 2006 and 2007 (2). Factors such as age, sex, race, family history, nutritional habits, decreased physical activity and daily calorie intake play a role in the emergence of obesity (3).

Duration of childhood obesity has been linked to the development of heart disease (4). In childhood obesity associated with an inactive lifestyle and malnutrition, deterioration in the blood lipid profile can often be observed. The condition can manifest in childhood, and if ignored as a disease and not treated, can facilitate the emergence of many health problems, especially cardiovascular diseases, later in life.

The aim of this study was to determine the frequency, type and prevalence of dyslipidemia due to childhood obesity.

MATERIALS and METHODS

This cross-sectional study was carried out at the Istanbul Zeynep Kamil Women and Children Diseases Training and Research Hospital Paediatrics Clinic, after the approval of the local ethics committee (19 October 2010–15647) and written consent was obtained from the parents. The study group was established after screening comprising 119 children aged 2–16 years with a BMI at the 95th percentile and above with an obese appearance who presented to the outpatient pediatric clinic of pediatrics of the hospital. The weight and height of the children were measured and the BMI was calculated and compared with a control group of 124 children selected from non-obese children in the same age group. Obesity was defined as at the 95th percentile or above in a curve created based on sex and age according to BMI in male and female Turkish children (2). Cases with a history of drug use that may lead to obesity or primary liver disease that may cause fatty liver were excluded from the study.

Early morning venous blood samples were obtained from the participants after 8–12 hours of fasting. Total cholesterol, total triglyceride, low-density lipoprotein (LDL) and high-density lipoprotein (HDL) levels were measured in the Biochemistry Laboratory of the Istanbul Zeynep Kamil Women and Children Diseases Training and Research Hospital from the serumprepared from these samples using the method developed by Skelton and Rudolph (5). The total cholesterol, total triglyceride, LDL and HDL assays were performed using a COBAS Integra® 800 device (Roche Diagnostics International AG, Rotkreuz, Switzerland) whit appropriate kits to determine the serum lipid profile.

The comparisons of the patient and control groups were made based on total cholesterol ≥170 mg/dl, LDL cholesterol ≥110 mg/dl and HDL cholesterol 35 mg/dl cut-off levels. The cut-off value for triglyceride was accepted as ≥100 mg/dl for those aged 2–15 years and ≥125 mg/dl for those aged ≥15 years.

The patients were divided into five categories for the evaluation:

- Category 1: normolipidemia
- Category 2: elevated LDL alone
- Category 3: elevated triglyceride and decreased HDL
- Category 4: elevated triglyceride and LDL
- Category 5: elevated triglyceride and LDL with decreased HDL (or increased LDL and decreased HDL)

The data were analyzed using IBM Statistical Package for the Social Sciences, version 16.0 (SPSS Inc., Armonk, NY, IBM Corp., USA). Descriptive statistics were performed in order to calculate the frequency, percentage, mean, standart deviation, and median values. To compare the data of two groups, a Chi-square test was used for the categorical variables and a Mann-Whitney U test was used for the continuous numeric values. Data were analyzed with 95% confidence intervals; $p<0.050$ was considered significant.

RESULTS

A total of 243 children aged 2–16 years were participated in the study, of whom 119 (50 males, 42% and 69 females, 58%) were

Table I: Comparison of case and control groups according to lipid profile

	Case group*	Control group*	Chi-square	p
Normolipidaemia	34 (37.4)	82 (75.9)	30.209	<0.001
Lipid profile abnormality	57 (62.6)	26 (24.1)		

**: n(%)*

Table II: Comparative analysis of age, BMI and serum lipid profile findings in case and control groups

	Case group			Control group			p
	Mean	SD	Median	Mean	SD	Median	
Age	8.96	3.65	9.30	9.31	3.82	9.00	0.714
Body mass index	25.33	4.06	24.50	17.74	2.54	16.95	<0.001
Total cholesterol	166.76	43.06	161.00	140.40	22.76	140.00	<0.001
Triglyceride	108.37	56.87	100.00	83.08	15.69	80.50	<0.001
LDL cholesterol	102.78	38.38	101.00	95.30	20.71	90.50	0.167
HDL cholesterol	47.17	15.00	46.00	47.60	8.47	46.00	0.308
Atherogenic index	3.82	1.35	3.60	3.07	0.86	2.98	<0.001

HDL: *High density lipoprotein,* ***LDL:*** *Low density lipoprotein,* ***SD:*** *Standard deviation*

Table III: Comparison of case and control groups in terms of abnormal serum cholesterol (total, LDL and HDL) and triglyceride levels

	Case group*	Control group*	Chi-square	p
High total cholesterol				
Yes	53 (44.5)	12 (9.7)	37.662	<0.001
No	66 (55.5)	112 (90.3)		
High triglycerides				
Yes	58 (48.7)	10 (8.1)	49.852	<0.001
No	61 (51.3)	114 (91.9)		
High LDL cholesterol				
Yes	46 (38.7)	26 (21)	9.112	0.003
No	73 (61.3)	98 (79)		
High HDL cholesterol				
Yes	28 (23.5)	7 (5.6)	15.754	<0.001
No	91 (76.5)	117 (94.4)		

***:** n (%)*

assigned to the obese patient group based on a BMI of 95th percentile and above, while 124 children (56 males, 45.2% and 68 females, 54.8%) were assigned to the control group. The mean ages of the patient and control groups were 8.96±3.65 and 9.31±3.82 years, respectively. There was no difference in terms of gender between the patients and the control group (p=0.621).

Lipid profile abnormality was significantly higher in the case group than in the control group (p<0.001) (Table I). The BMI (p<0.001), total cholesterol (p<0.001), triglyceride (p<0.001) and atherogenic index (p<0.001) values were found to be significantly higher in the study group than in the control group, as seen in Table II. The difference in total cholesterol levels was due to significantly higher triglyceride levels in the case group compared to the control group. There was no difference in the age (p=0.714), LDL cholesterol (p=0.167) and HDL cholesterol (p=0.308) levels of the two groups.

A comparison of the two groups revealed that the number of patients with high total cholesterol (p<0.001), triglyceride (p<0.001), LDL cholesterol (p=0.003) and HDL cholesterol (p<0.001) levels were significantly higher in the study group than in the control group (Table III).

Table IV. Distribution of case and control groups according to lipid profiles

Category	Case group*			Control group*		
	Male	Female	Total	Male	Female	Total
1	18 (47.4)	16 (30.2)	34 (37.4)	35 (70)	47 (81.0)	82 (75.9)
2	7 (18.4)	12 (22.6)	19 (20.9)	14 (28)	11 (19.0)	25 (23.2)
3	4 (10.5)	8 (15.1)	12 (13.2)	0	0	0
4	5 (13.2)	11 (20.8)	16 (17.6)	1 (2)	0	1 (0.9)
5	4 (10.5)	6 (11.3)	10 (11.0)	0	0	0

***:** n(%)*

In study group no significant differences were determined in the age (p=0.331), total cholesterol (p=0.976), LDL cholesterol (p=0.633), HDL cholesterol (p=0.536) and triglyceride (p=0.586) levels of the male and female participants. Similarly, no significant differences were identified in the elevated total cholesterol (p=0.692) and LDL cholesterol (p=0.908), decreased HDL cholesterol (p=0.641) and increased triglyceride (p=0.291) levels of the male and female participants in control group.

When the case group is evaluated according to five lipid profiles, normolipidemia in 37.4%, only high cholesterol in 20.9%, high triglyceride and low HDL cholesterol in 13.2%, high LDL cholesterol and triglyceride in 17.6%, and low HDL cholesterol along with high LDL cholesterol-triglyceride levels were detected in 11% of the patients. In the control group, normolipidemia was 75.9%, LDL elevation alone was 23.1%, and LDL cholesterol and triglyceride elevation was 0.9% (Table IV).

DISCUSSION

Although obesity can be seen at any age, childhood obesity is particularly important since it affects the later periods of life and provides a basis for many adult diseases (6–8). The majority of research studies on the prevalence of obesity and its risk factors focus on adulthood, despite the importance of childhood obesity and its recently increasing frequency. A prevalence of

obesity of 16.3% was reported among children aged 2–17 years in a study conducted in the United States between 2003 and 2006, while a ratio of 9.7% was reported among school children in Venezuela (9,10). In Turkey, ratios varying between 1.6% and 12.5% have been reported in studies evaluating the prevalence of childhood obesity (11,12). The study revealed that the prevalence of the obesity in boys was slightly higher than in girls, but the difference was not significant (13–15). This lack of any significant difference between the childhood obesity rates of males and females may be due to the absence of such factors that increase the risk of obesity as pregnancy and menopause in childhood. Obesity was found to be slightly more common among female children (50.4%) than male children (47.2%) in our study compared to previous studies, although no significant difference was found between them, which concur with the findings in literature.

The findings of this present study support earlier studies reporting increased dyslipidemia in obese children, with mean total cholesterol and triglyceride levels significantly higher in the obese patients than in the control group. Childhood obesity has shown to be significantly associated with increased total cholesterol (44.5%), triglyceride (48.7%) and LDL (38.7%) levels, and decreased HDL (23.5%), suggesting an association between obesity and dyslipidemia, and highlighting the need to monitor the lipid profiles of people with obesity in the early phases and the application of proactive measures.

While BMI is used as a standard method in the diagnosis of obesity in adulthood, it is not used as a standard for childhood obesity because BMI assessment differs according to age in children (16). Although BMI is often used to define obesity, the association between BMI and lipid profile was not evaluated in the present study because the sample included children of different ages. Furthermore, the presence of characteristics that could contribute to obesity, such as familial factors, nutritional habits, physical activity and sedentary lifestyle, and their effects on obesity, were not analyzed given the cross-sectional study design.

Prospective and multicenter studies involving larger series are required to evaluate the cause-and-effect relationships between obesity and dyslipidemia, as the fact that parents may be deluded into thinking their child is not obese may lead them to be unwilling to allow them to be tested. This may be a reason for the small number of people participating in this study. The lack of awareness among physicians, in addition to the attitudes of families and the changing life circumstances have all contributed to obesity becoming a common public health problem, and it is clear that childhood obesity will continue to be a significant public health problem in the future.

Obesity and dyslipidemia in adulthood are conditions that require early diagnosis using appropriate screening methods and timely medical interventions due to the potential complications and socioeconomic outcomes. An efficient screening protocol in childhood may contribute to the better determination, prevention and treatment of risk factors associated with childhood obesity and accompanying dyslipidemia, and quality of life would be improved through the prevention of complications and comorbidities. The prevalence of the obesity-related chronic diseases among young adults would be significantly increased later in life without the implementation of the required precautions and an efficient treatment strategy for children related to obesity (17). In this context, the measurement of the lipid profile can be considered vital, along with the launch of a medical intervention program in support of obese children. In addition, screening for obesity in larger groups and studies evaluating the risk factors for the diagnosis of metabolic syndrome, diabetes mellitus and hypertension, are required, as well as programs to measure dyslipidemia, triglyceride, HDL and LDL levels, fasting blood glucose, insulin resistance and blood pressure values in obese children.

A multidisciplinary approach to obese children is needed to guide, for example, weight loss programs, the regulation of physical activity, changes to sedentary lifestyles and behavioral changes. Treatments targeting a decrease in lipid levels should be applied to obese patients, and physicians should explain the factors promoting the development and consequences of obesity when providing information on infant and child nutrition to the family during healthy child follow-up visits (18–20). Educating school-age children on appropriate nutrition and the prevention of obesity, and ensuring access to healthy nutrition school canteens are also important. As a further approach, school administrators should schedule regular gym classes, support students in participating in such classes and promote sporting activities. Reducing the screen time of children by regulating their use of television and computers would support the efforts to reverse a sedentary lifestyle. Efficient strategies targeting society as a whole should also be implemented in addition to those applied by the family and school administrations. Sports facilities from which all children can benefit should be created, and children and young people should be encouraged to take part in athletic activities as a communal duty. Advertisements in the media should be strictly audited when promoting high-calorie and hazardous food.

CONCLUSION

In conclusion, awareness of childhood obesity and dyslipidemia should be increased, and efficient screening, diagnostic and treatment strategies should be developed not only for physicians and healthcare personnel, but also for families, schools and society, as a combined measure against obesity and dyslipidemia, and throughout such a process, obesity should be regarded as a significant and preventable public health problem.

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Strengths and Difficulties Regarding Attention Deficit Hyperactivity Disorder: Correlation with Social Responsiveness and Disorder Severity

Dikkat Eksikliği Hiperaktivite Bozukluğunda Güçler ve Zorluklar: Sosyal Cevaplılık ve Bozukluk Şiddeti ile İlişkisi

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ABSTRACT

Objective: Children with neurodevelopmental disabilities often experience social difficulties. Children with attention deficit hyperactivity disorder (ADHD) are more likely to experience peer rejection and cognitive, academic, family, and professional difficulties. This investigation aimed to identify the predictors of difficulties faced by children and adolescents with ADHD.

Material and Methods: We established ADHD diagnoses based on DSM-5 criteria. Moreover, every participant had a diagnostic evaluation by a child and adolescent psychiatrist using the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS-PL) and a detailed sociodemographic form documented. Parents completed the Turgay DSM IV-Based Child and Adolescent Behavioural Disorders Screening and Rating Scale (T-DSM-IV-S), the Strengths and Difficulties Questionnaire (SDQ), and the Social Responsiveness Scale (SRS) for their children.

Results: The study included 99 children, 59 in the ADHD group and 40 in the control group. There was no significant difference between the groups regarding gender and age. The mean scores of T-DSM-IV-S [Attention deficit (AD), Hyperactivity/impulsivity (H/I), Oppositional defiant disorder (ODD), Conduct disorder (CD)], SDQ, and SRS were significantly higher in the ADHD group than in the control group. Among the independent variables in the regression model, SRS total scores significantly predicted SDQ-total ($\beta = 0.238$, $p = 0.033$) and SDQ-emotion ($\beta = 0.439$, $p = 0.001$) scores in the ADHD group.

Conclusion: Children diagnosed with ADHD may have more receptive deficits in mutual interactions than their peers, which greatly impacts their social behaviors. Early social skills training for social functioning impairments may reduce the condition's social impact.

Key Words: ADHD, Neurodevelopmental Disorders, SDQ, SRS

ÖZ

Amaç: Nörogelişimsel bozukluğu olan çocuklar sıklıkla sosyal zorluk yaşarlar. Dikkat eksikliği hiperaktivite bozukluğu (DEHB) olan çocukların akran reddi ve bilişsel, akademik, ailevi ve mesleki zorluklar yaşama olasılığı daha yüksektir. Bu araştırma, DEHB'li çocuk ve ergenlerin günlük yaşamlarında karşılaştığı zorlukların belirleyicilerini tespit etmeyi amaçlamıştır.

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Ethics Committee Approval / *Etik Kurul Onayı*: This study was conducted in accordance with the Helsinki Declaration Principles. The study was approved by Alaaddin Keykubat University Faculty of Medicine Ethics Committee (10354421-2023/5-09).

Contribution of the Authors / Yazarların katkısı*: *AYDOĞAN AVŞAR P: Constructing the hypothesis or idea of research and/or article, Planning methodology to reach the Conclusions, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in necessary literature review for the study, Taking responsibility in the writing of the whole or important parts of the study, Reviewing the article before submission scientifically besides spelling and grammar. ***KARA T:*** Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Reviewing the article before submission scientifically besides spelling and grammar ***KOCAMAN O:*** Organizing, supervising the course of progress and taking responsibility of the research/ study, Taking responsibility in logical interpretation and conclusion of the results, Reviewing the article before submission scientifically besides spelling and grammar. ***KURU T:*** Taking responsibility in logical interpretation and conclusion of the results, Reviewing the article before submission scientifically besides spelling and grammar

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Gereç ve Yöntemler: DEHB tanıları DSM-5 kriterlerine göre belirlenmiştir. Ayrıca, her katılımcı bir çocuk veya ergen psikiyatristi tarafından Okul Çağı Çocukları için Duygulanım Bozuklukları ve Şizofreni Görüşme Çizelgesi- Şimdi ve Yaşam Boyu Şekli- (ÇDŞG-ŞY-T) kullanılarak tanısal bir değerlendirmeye tabi tutulmuş ve ayrıntılı bir sosyodemografik form belgelenmiştir. Ebeveynler çocukları için Turgay DSM IV Tabanlı Çocuk ve Ergen Davranış Bozuklukları Tarama ve Derecelendirme Ölçeğini (T-DSM-IV-S), Güçler ve Güçlükler Anketini (SDQ) ve Sosyal Duyarlılık Ölçeğini (SRS) doldurmuştur.

Bulgular: Bu çalışmaya 99 çocuk dahil edilmiştir. DEHB grubunda 59 ve kontrol grubunda 40 çocuk. Gruplar arasında cinsiyet ve yaş açısından anlamlı bir fark yoktu. T-DSM-IV-S (AD, H/I, ODD, CD), SDQ ve SRS ortalama puanları DEHB grubunda kontrol grubuna göre anlamlı derecede yüksektir. DEHB grubunda oluşturulan regresyon modelindeki bağımsız değişkenler arasından SRS toplam skoru toplam SDQ ($\beta = 0.238$, $p = 0.033$) ve SDQ-duygu alt ölçeği ($\beta = 0.439$, $p = 0.001$) skorlarını anlamlı şekilde yordamıştır.

Sonuç: DEHB tanısı alan çocuklar, karşılıklı etkileşimlerde akranlarına göre daha fazla alıcı eksikliğe sahip olabilir ve bu da sosyal davranışlarını büyük ölçüde etkiler Sosyal işlevsellik bozuklukları için erken sosyal beceri eğitimi, durumun etkisini azaltabilir.

Anahtar Sözcükler: DEHB, Nörogelişimsel Bozukluklar, SDQ, SRS

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) are neurodevelopmental disorders that frequently occur concurrently. In addition, these two developmental disorders share overlapping behavioral characteristics and common etiological factors (1). The most prevalent mental illness in childhood, ADHD, has a lifetime incidence of 5 to 7%. The symptoms of ADHD include inattention, hyperactivity, and impulsivity, which include challenges with maintaining focus, being still, and waiting one's turn (2). On the other hand, with a frequency of approximately 2%, ASD is thought to be a rarer disease (3). In addition to so-called restricted, repetitive, and stereotyped behaviors and limited interests (RRBIs), the behavioral symptoms of ASD include difficulties with social communication and interaction. Researchers and clinical professionals have long acknowledged that there is significant overlap between ASD and ADHD, despite these behaviors that seem to be distinct from one another. According to formal studies, 20–80% of children diagnosed with ASD also fulfill the DSM-IV criteria for ADHD. Actually, among children with ASD, ADHD is the most prevalent comorbid mental disorder. Subsequently, 30–60% of individuals diagnosed with ADHD also had clinical signs of ASD. It is worth noting that these difficulties involve every characteristic of ASD, such as difficulties in social interaction and communication as well as RRBIs (4). Until the implementation of the Diagnostic and Statistical Manual of Mental Disorders 5 (DSM-5), individuals diagnosed with ASD could not also be diagnosed with ADHD (5). Multiple DSM-5 clinical classification-based neurocognitive studies have demonstrated that individuals with ADHD and ASD have more attention difficulties than those with ASD alone (6). Furthermore, ADHD accompanied by autism symptoms results in greater deficits in adaptive functioning, as well as more severe social and cognitive difficulties (7). These findings offer substantiation for the notion that these disorders are distinct. In previous versions of the DSM, ADHD, and ASD were considered mutually exclusive diagnoses. However, the DSM-5 now permits the co-occurrence of ADHD and ASD (8).

Approximately one-third of children diagnosed with ADHD exhibit symptoms that are diagnostic of ASD (4). Reports indicate that, similar to children diagnosed with ASD, the majority of children diagnosed with ADHD exhibited social deficits. Likewise, difficulties in nonverbal communication and stereotypical hand and body movements also have been observed in children with ADHD (9). It was reported that 59% of children with ADHD exhibited moderate autistic-like behaviors, whereas 7% of these children displayed severe ASD symptoms (10). ADHD is characterized by social interaction and communication deficits, but these deficits are less pronounced than those of ASD. Social skill deficits associated with ADHD have substantial implications for an individual's cognitive abilities (11). Additionally, research suggests that frontal cortex abnormalities are present in both ADHD and ASD (12). This suggests that deficits in executive functioning are associated with both conditions (13). The examination as mentioned above of behavioral, cognitive, neuropsychological, and neurobiological data indicates that the symptom concurrence observed in individuals with ASD and ADHD is indicative of a co-morbid condition.

There is a prevalent association between children who have developmental disorders and increased susceptibility to social impairment. Children who have ADHD or ASD are at an increased risk of encountering higher levels of peer rejection and experiencing impairments in cognitive, academic, familial, and occupational domains. Children diagnosed with both ASD and ADHD exhibit more pronounced impairments in social and adaptive skills when compared to children with ASD alone (14). Furthermore, deficits in social functioning are significant contributors to the adverse consequences of ADHD, both in the short and long term (15). The idea of social functioning is founded on cognitive and social skills and is influenced by both personal traits and contextual variables. Among the more advanced social abilities that contribute to the development of social competence are the ability to interact with others and discern their intentions, emotions, and facial expressions (16). Social reciprocity is an integral aspect of social functioning. Social competence is the ability to establish and sustain reciprocal connections while effectively adapting to social circumstances. Children diagnosed with ADHD have notable challenges in their social interactions. Approximately 50–60% of children with ADHD are rejected by their classmates, compared to just 13–16% of children in primary school classes (17,18).

In children with ADHD, being domineering, intrusive, rigid, controlling, rude, explosive, argumentative, quickly irritated, inattentive during organized sports or games, and breaching game regulations may lead to rejection (19).

In both clinical and population samples, oppositional defiant disorder (ODD) and conduct disorder (CD) are reported to often coexist with ADHD (20). These coexisting conditions are known to be associated with a more unfavorable outcome of ADHD. In a ten-year follow-up study, major depression was linked to ODD comorbidity, whereas CD comorbidity was associated with a significantly increased risk of illegal substance use disorders, smoking, and bipolar disorder in children with ADHD (21). Additionally, compared to children with ADHD alone, children with ADHD with CD comorbidity are more likely to participate in criminal activity, have driving-related consequences, and develop antisocial personality disorder as adults (22). Other research has indicated that children with ADHD and ODD exhibit a higher percentage of ADHD symptoms and neuropsychological deficits than those without ODD. The findings of the study also suggest that emotional dysregulation and social impairment are more prevalent in individuals with comorbid ODD (23).

Upon examining the literature, we found some research investigating deficits in social functioning in ADHD primarily concentrates on co-occurring disorders, and other investigations discuss theories regarding etiology. The goal of this study was to determine whether the Social Responsiveness Scale (SRS) scores, which measure the presence and severity of social impairment and the Turgay DSM IV-Based Child and Adolescent Behavioural Disorders Screening and Rating Scale (T-DSM-IV-S) scores, which serve as a measurement tool for screening and diagnosing children with ADHD, could predict the total and subscale scores of the strengths and difficulties questionnaire as indicators of the daily life challenges faced by children with ADHD. We hypothesized that worse social functioning is associated with greater difficulties in the daily lives of children with ADHD and aim to examine this association in light of sociodemographic data.

MATERIALS and METHODS

This study was conducted between December 2023 and February 2024 at Alanya Training and Research Hospital. Children and adolescents (n= 59, 17 girls and 42 boys) between the ages of 6 and 18 who volunteered and had an ADHD diagnosis based on DSM-5 criteria have been included in the research. The patients received the diagnosis of ADHD for the first time, and medical treatment was not initiated. Exclusion criteria for the ADHD group included comorbid diagnoses of psychosis, mental retardation, other neurodevelopmental disorders such as ASD and specific learning disorder (SLD), oppositional defiant disorder (ODD), conduct disorder (CD), any mood or anxiety disorder, and a history of systemic illness. The control group consisted of 40 (16 girls and 24 boys) age- and gender-matched healthy children who applied to the pediatric outpatient clinic at Alanya Training and Research Hospital for regular care and had no current illness or mental problem.

The researchers have documented sociodemographic and clinical information using a questionnaire. Every participant had a diagnostic evaluation by a child/adolescent psychiatrist using the Schedule for Affective Disorders and Schizophrenia for School-Aged Children, Present and Lifetime Version (K-SADS-PL). ADHD diagnoses were made based on the criteria established in the DSM-5 (24). Parents completed the Turgay DSM IV-Based Child and Adolescent Behavioural Disorders Screening and Rating Scale (T-DSM-IV-S), the Strengths and Difficulties Questionnaire (SDQ), and the Social Responsiveness Scale (SRS) for their children (25-27).

The study was approved by Alaaddin Keykubat University Faculty of Medicine Ethics Committee (10354421-2023/5-09). We received the written informed consent from the parent and the verbal consent from the children.

Statistical Analyses

Frequency and percentage values for categorical data and mean and standard deviations for continuous variables were calculated. The normal distribution of the data for the control and ADHD groups was evaluated by analyzing the kurtosis-skewness values and graphs (Q-Q plot, histogram). The results within the range of ±1.5 for kurtosis-skewness values were considered to have a normal distribution. The homogeneity of variances was examined by Levene's test. Multicollinearity was tested by VIF values (VIF<10). In the comparison of the research scale results for ADHD and the control group, the Mann Whitney U test was used. The chi-square test was used to compare categorical variables. Spearman correlation coefficients were used for the relationship between variables. Regression analysis was tested in which, the mean SDQ-total and subscale score results were dependent and the mean scores of AD (attention deficit), H/I (hyperactivity-impulsivity), ODD (oppositional defiant disorder), CD (conduct disorder) of the T-DSM-IV-S scale, and the SRS scale were independent variables. Analyses were performed with Jamovi (Version 2.4) and $p<0.05$ values were considered significant.

RESULTS

We conducted the study with 99 volunteers who provided their informed consent. Total 59 (59.6%) of the participants were diagnosed with ADHD, and the mean age of the participants was 9.88 ± 1.48. Total 33 (33.3%) of the participants were girls, and 66 (66.7%) of the participants were boys. Table I displays the sociodemographic characteristics of the control and ADHD groups. Accordingly, no significant difference was found between the groups in terms of gender ($p = 0.247$) or age ($p =$

Table I: Comparison of Demographic Characteristics of ADHD and Control Groups

	ADHD	Control	χ^2 or U	p
Gender*				
Female	17 (28.8)	16 (40)	1.342	0.247‡
Male	42 (71.2)	24 (60)		
Maternal Education*				
Until middle school	31 (53.4)	19 (52.8)	0.004	0.950‡
High school/ above	27 (46.6)	17 (47.2)		
Paternal Education*				
Until middle school	28 (48.3)	15 (41.7)	0.391	0.532‡
High school/ above	30 (51.7)	21 (58.3)		
Age†	9.881±1.480	9.940±1.585	1160	0.886§
Maternal Age†	35.797±5.527	36.750±5.271	1029	0.282§
Paternal Age†	39.034±6.544	40.200±5.140	973	0.140§
Paternal-Maternal Age difference†	3.237±3.486	3.450±3.029	1107	0.603§

***:** n(%), **†:** mean±SD, **‡:** Chi-Square, **§:** Mann Whitney U*

Table II: Comparison of Scale Scores of ADHD and Control Groups

	n	Mean Rank	Sum of Rank	U	Z	p	ES
T-DSM-IV-S AD							
ADHD	59	69.01	4071.50	58.5	-8.007	<0.001	0.805
Control	40	21.96	878.50				
T-DSM-IV-S H/I							
DEHB	59	68.36	4033.50	96.5	-7.738	< 0.001	0.778
Control	40	22.91	916.50				
T-DSM-IV-S ODD							
DEHB	59	64.34	3796.00	334	-6.042	< 0.001	0.607
Control	40	28.85	1154.00				
T-DSM-IV-S CD							
ADHD	59	61.59	3634.00	496	-5.190	< 0.001	0.522
Control	40	32.90	1316.00				
SRS Total							
ADHD	59	68.20	4024.00	106	-7.661	< 0.001	0.770
Control	40	23.15	926.00				
SDQ Total							
ADHD	59	67.93	4008.00	122	-7.556	< 0.001	0.759
Control	40	23.55	942.00				

***ES:** Effect Size, **ADHD:** Attention-deficit/hyperactivity disorder, **AD:** Attention deficit, **H/I:** Hyper-activity-impulsivity, **ODD:** Oppositional defiant disorder, **CD:** Conduct disorder, **SRS:** Social Responsiveness Scale, **SDQ:** Strengths and difficulties questionaire, **T-DSM-IV-S:** Turgay DSM IV-Based Child and Adolescent Behavioural Disorders Screening and Rating Scale, Mann Whitney-U.*

0.886). Similarly, no significant difference was found between the two groups in terms of, maternal age (U = 1029.000 p=0.282, z=-1.079), paternal age (U = 973.000 p=0.140, z=-1.479) and paternal-maternal age difference (U = 1107.000 p=0.603, z=-0.524) (Table I).

In comparison to the control group, the ADHD group exhibited significantly higher scores in all sub-scales of the T-DSM-IV-S scale (AD, p<0.001; H/I, p<0.001; ODD, p<0.001; CD, p<0.001) and the total scores of the SRS (p<0.001) and the SDQ (p<0.001) (Table II).

Table III: Correlation coefficients of scales in the ADHD Group

	T-DSM-IV-H/I	T-DSM-IV-CD[1]	T-DSM-IV-AD	T-DSM-IV-ODD	SRS Total
T-DSM-IV-H/I	—				
T-DSM-IV-CD[1]	0.295*	—			
T-DSM-IV-AD	0.385†	0.268 *	—		
T-DSM-IV-ODD	0.433‡	0.756‡	0.277*	—	
SRS Total	0.294 *	0.266*	0.250	0.284*	—
SDQ Total	0.459‡	0.547‡	0.421‡	0.549‡	0.404†

***:** p <0.050, **†:** p < 0.010, **‡:** p < 0.001= Spearman's RHO*

Table IV: Regression Analysis for SDQ-emotion Subscale Score

Predictor	Unstd Coef	SE	Stand. Coef	t	p
T-DSM-IV-S-AD	-0.003	0.052	-0.006	-0.048	0.962
T-DSM-IV-S-H/I	0.021	0.055	0.056	0.387	0.700
T-DSM-IV-S-ODD	0.062	0.064	0.175	0.957	0.343
T-DSM-IV-S-CD[1]	-0.052	0.107	-0.084	-0.490	0.626
SRS Total	0.054	0.016	0.439	3.399	0.001

***Unstd Coef:** Unstandardized Coefficients*

Table V: Regression Analysis for SDQ-conduct Subscale Score

Predictor	Unstd. Coef	SE	Stand. Coef	t	p
T-DSM-IV-S-AD	0.055	0.042	0.143	1.310	0.196
T-DSM-IV-S-H/I	0.024	0.045	0.064	0.531	0.598
T-DSM-IV-S-ODD	0.082	0.052	0.236	1.559	0.125
T-DSM-IV-S-CD[1]	0.259	0.087	0.422	2.981	0.004
SRS Total	0.002	0.013	0.016	0.150	0.881

***Unstd Coef:** Unstandardized Coefficients*

Except for the correlation between the T-DSM-IV-S-AD subscale scores and the total SRS scores (r=0.250, p=0.056), all scale scores showed significant correlations with each other (Table III). The regression model was tested with the scores of SDQ total and subscales as the dependent variable. VIF values were reviewed for multicollinearity. VIF values were found to be in the range of 1.17–2.38. The model in which T-DSM-IV-S-AD, T-DSM-IV-H/I, T-DSM-IV-S-ODD, T-DSM-IV-S-CD, and total SRS scores were independent variables and SDQ-peer and SDQ-prosocial subscale scores were the dependent variables, were non-significant (F(5.53) = 0.913 p=0.473, F(5.53) = 1.449 p=0.222 respectively). The model in which T-DSM-IV-S-AD, T-DSM-IV-H/I, T-DSM-IV-S-ODD, T-DSM-IV-S-CD, and total SRS scores were independent variables and the mean SDQ-hyperactivity score was the dependent variable was significant, F(5.53) = 3.733 p=0.006. However, although the model was significant, no independent variable could significantly predict SDQ-hyperactivity scores (p>0.050). The model in which T-DSM-IV-S-AD, T-DSM-IV-H/I, T-DSM-IV-S-ODD, T-DSM-IV-S-CD, and total SRS scores were

Table VI: Regression analysis for SDQ Scale Total Score

Predictor	Unstd Coef	SE	Stand. Coef	t	p
T-DSM-IV-S-AD	0.143	0.095	0.167	1.50	0.139
T-DSM-IV-S-H/I	0.164	0.100	0.200	1.64	0.108
T-DSM-IV-S-ODD	0.143	0.118	0.187	1.21	0.230
T-DSM-IV-S-CD [1]	0.273	0.196	0.202	1.40	0.169
SRS Total	0.063	0.029	0.238	2.19	0.033

Unstd Coef: *Unstandardized coefficients*

independent variables and SDQ-emotion score was the dependent variable was significant, F(5.53) = 3.630 p=0.007. Approximately 18.5 % of the variance in SDQ-emotion score was explained by the independent variables in the model. Among the independent variables in the model, only the SRS total score (β =0.439, p < 0.001) significantly predicted the SDQ-emotion sore (Table IV).

The model in which T-DSM-IV-S-AD, T-DSM-IV-H/I, T-DSM-IV-S-ODD, T-DSM-IV-S-CD, and total SRS results were independent variables and SDQ-conduct result was a dependent variable was significant, F(5.53) = 10.154 p<0.001. Approximately 44% of the variance in SDQ-conduct was explained by the independent variables in the model. Among the independent variables in the model, only the T-DSM-IV-S-CD score (β=0.422, p=0.004) significantly predicted the SDQ-conduct score (Table V).

The model in which T-DSM-IV-S-AD, T-DSM-IV-H/I, T-DSM-IV-S-ODD, T-DSM-IV-S-CD, and total SRS scores were independent variables and total SDQ-total score was the dependent variable was significant, F(5.53) = 9.351 p<0.001. Approximately 42% of the variance in the SDQ total was explained by the independent variables in the model. Among the independent variables in the model, only the total SRS score (β=0.238, p=0.033) significantly predicted the SDQ total score (Table VI).

DISCUSSION

The current research investigated the hypothesis that children and adolescents diagnosed with ADHD may have autism-like symptoms and more impaired social responsiveness than their peers, resulting in challenges in their daily lives. Consistent with our hypotheses, the study results revealed that children and adolescents with ADHD exhibited more impaired social responsiveness and encountered greater difficulties than their peers. Moreover, there is significant evidence indicating that social responsiveness is a reliable predictor of emotional symptoms and total difficulties experienced by children and adolescents with ADHD.

It is well known that comorbidities are often present with ADHD in childhood (20). When the literature is examined, it is seen that ADHD is accompanied by oppositional defiant disorder in approximately 30-50% and conduct disorder in 5% (28). Multiple studies have proven that when ODD and/or CD accompany ADHD, it exacerbates the clinical presentation and leads to further decline in the child's functioning (29). In a longitudinal prospective study, CD symptoms were identified as the most reliable predictor of severe antisocial behavior, while ODD symptoms predicted persistent involvement in the juvenile justice system in children with ADHD. Additionally, the onset of internalizing and social problems was independently predicted by ODD symptoms (30). When ADHD co-occurs with behavioral symptoms of ODD and CD, the child's problematic behavior intensifies, leading to more incidences of peer bullying and exclusion. According to reports, the prognosis for an individual with both ADHD and ODD diagnosis is significantly worse than if they were to be diagnosed with a single disorder. This is because individuals who have both disorders are more likely to suffer from anxiety, depression, conduct disorder, and antisocial personality disorder in later life (31). Additionally, there is a higher likelihood of experiencing physical and psychological violence within the family which leads to more life challenges (32). The literature above indicates that individuals with ADHD face greater challenges in their daily lives as the severity of disruptive behavioral symptoms accompanying ADHD increases throughout childhood. In the same vein, our investigation uncovered that the ADHD group exhibited significantly higher scores on the ODD and CD subscales of the Turgay DSM IV-Scale at the symptom level, albeit not at the diagnostic level, in comparison to the control group. Additionally, we found elevated scores on the strengths and difficulties questionnaire among children diagnosed with ADHD compared to healthy controls in our study. These scores serve as indicators of the difficulties that individuals face in their daily lives, in interpersonal relationships, and their overall functioning. A statistically significant correlation was found between the T-DSM-IV-S, disruptive behaviors OD, and CD subscale scores and the total scores of SDQ. Furthermore, regression analysis demonstrated that SDQ-conduct subscale scores were significantly predicted by T-DSM-IV-S CD subscale scores indicating that CD symptoms accompanying ADHD lead to more challenges in conduct domains.

Among the mental disorders that are frequently observed during childhood, ADHD and social functioning impairment are closely related. Prior research indicates a higher prevalence of autistic traits in individuals diagnosed with ADHD (33,34). Our research also revealed that children diagnosed with ADHD had higher SRS total scores compared to the control group as an indicator of social impairment. Although social difficulties are not an essential diagnostic criterion for ADHD, children with the disorder often struggle with interpersonal relationships. These challenges are often seen as a direct consequence of the core symptoms of ADHD. Inattentive behaviors may cause a child to fail to notice social signs, impulsiveness can lead to harming peers, and hyperactivity can hamper participation in planned activities and result in avoiding classmates (1). Approximately 50–60% of children with ADHD are reported to face rejection from their peers resulting in difficulties for children and adolescents with ADHD in their daily lives. Many children with

ADHD are despised within minutes of their first social encounter and denied further chances to improve social skills, which leads to additional rejection (35). Poor emotional regulation, deficits in conversation and reciprocity, social-cognitive biases, and a high incidence of intrusive behavior all appear to be associated with these social difficulties (36). Alternately stated, social difficulties associated with ADHD may result from deficiencies in internal regulatory mechanisms (37). Aligned with this data, the findings of our study indicate a significant correlation between the total scores of the SRS and the SDQ scores in children and adolescents with ADHD. Moreover, regression analyses revealed that the total SRS score which measures social responsiveness, emerged as a significant predictor of the emotional and overall difficulties these individuals faced, as determined by the SDQ. The difficulties that children with ADHD experience seem to be more closely associated with autistic symptoms than with AD, HI, and OD symptoms.

Based on all the data above, children diagnosed with ADHD may experience much more receptive impairments in mutual relationships than their peers, which significantly affects their social behavior. It makes it challenging for these children to offer appropriate emotional responses to events and adjust to their circumstances. Implementing intervention programs, such as early social skills training for deficiencies in social functioning in certain areas, may lessen the negative social implications of the condition in adulthood. Comorbid symptoms of disruptive disorders also should be included in interventions in addition to the diagnosis of ADHD, and if required, extra treatments for these disorders.

CONCLUSION

The cross-sectional nature of our research, its limited scope at a single site, and the small sample size may hinder the applicability of the findings to a broader population. We only obtained the data for our study from parental reports. Consequently, it is believed that including the designated factors about the social responsiveness of children in assessments would enhance the efficacy of prospective studies, and multicenter research may provide more accurate findings on this topic.

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Role of Ultrasonography and Dynamic Renal Scintigraphy Parameters in Decision Making Regarding Performance of Pyeloplasty in Children with Ureteropelvic Junction Obstruction

Üreteropelvik Bileşke Darlığı Olan Çocuklarda Piyeloplasti Kararı Verilmesinde Ultrasonografi ve Dinamik Böbrek Sintigrafisinin Rolü

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ABSTRACT

Objective: There are conflicting results regarding the time of surgical treatment in patients with ureteropelvic junction obstruction (UPJO). Therefore, we aimed to compare the predictive power of ultrasonography (USG) and dynamic renal scintigraphy parameters in the diagnosis and treatment of UPJO.

Material and Methods: Patients diagnosed with UPJO between 2015 and 2020 were evaluated retrospectively, other congenital urinary anomalies were excluded. Renal pelvis anteroposterior diameter (APD) was evaluated by USG and staged according to the Society for Fetal Urology grading system. In dynamic renal scintigraphy, time to reach maximum renal activity (Tmax), time to clear half of the maximum activity (T1/2), differential renal function, and diuretic response were recorded.

Results: A total of 59 patients were included. Thirteen of 59 (22.0%) patients underwent pyeloplasty. The frequency of high-grade hydronephrosis and renal pelvis APD was higher in the pyeloplasty group than in the non-pyeloplasty group. In addition, Tmax and T1/2 were significantly longer in the pyeloplasty group than in the non-pyeloplasty group ($p<0.010$). Binary logistic regression analysis revealed that only increased renal pelvis APD was independently associated with pyeloplasty ($p = 0.030$; odds ratio = 1.2). An APD of 21.5 mm was the best cutoff value to identify patients requiring pyeloplasty. The sensitivity and specificity were 84.0% and 87.0%, respectively

Conclusion: Our findings suggest that USG and dynamic renal scintigraphy are useful tools for determining whether to perform pyeloplasty in patients with UPJO. Furthermore, APD can be a reliable, easy, and inexpensive method for follow-up and treatment.

Key Words: Child, Hydronephrosis, Kidney pelvis, Ultrasonography

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ÖZ

Amaç: Üreteropelvik bileşke darlığı (UPD) olan hastalarda cerrahi tedavinin zamanı konusunda çelişkili sonuçlar bulunmaktadır. Bu nedenle UPD tanı ve tedavisinde ultrasonografi (USG) ve dinamik böbrek sintigrafisi parametrelerinin öngörücü gücünü karşılaştırmayı amaçladık.

Gereç ve Yöntemler: 2015-2020 yılları arasında UPD tanısı alan hastalar geriye dönük olarak değerlendirildi, diğer konjenital üriner anomaliler dışlandı. Renal pelvis ön-arka çapı USG ile değerlendirildi ve Fetal Üroloji Derneği'nin derecelendirme sistemine göre evrelendi. Dinamik böbrek sintigrafisinde maksimum böbrek aktivitesine ulaşma süresi (Tmax), maksimum aktivitenin yarısının temizlenmesine kadar geçen süre (T1/2), diferansiyel böbrek fonksiyonu ve diüretik yanıtı kaydedildi.

Bulgular: Çalışmaya 59 hasta dahil edildi. Elli dokuz hastanın 13'üne (%22) piyeloplasti yapıldı Piyeloplasti grubunda (%22) piyeloplasti yapılmayan gruba göre yüksek dereceli hidronefroz tesbit edildi ve bu grupta renal pelvis ön-arka çapı daha fazlaydı. Ayrıca piyeloplasti grubunda Tmax ve T1/2 değerleri piyeloplasti yapılmayan gruba göre anlamlı derecede daha uzundu ($p<0.010$). İkili lojistik regresyon analizi, yalnızca renal pelvis ön-arka çap artışının piyeloplasti ile bağımsız olarak ilişkili olduğunu ortaya çıkardı ($p = 0.030$; olasılık oranı= 1.2). Piyeloplasti için en uygun renal pelvis ön-arka çap eşik değeri 21.5 mm olarak belirlendi. Duyarlılık ve özgüllük sırasıyla %84.0 ve %87.0'di.

Sonuç: Bulgularımız USG ve dinamik böbrek sintigrafisinin UPD olan hastalarda piyeloplasti yapılıp yapılmayacağının belirlenmesinde yararlı araçlar olduğunu göstermektedir. Ayrıca, pelvis ön-arka çapı ölçümü takip ve tedavide güvenilir, kolay ve ucuz bir yöntem olabilir.

Anahtar Sözcükler: Çocuk, Hidronefroz, Renal pelvis, Ultrasonografi

INTRODUCTION

Ureteropelvic junction obstruction (UPJO) is an anatomical or physiological impairment of urine outflow from the renal pelvis to the ureter. It is one of the most common causes of unilateral hydronephrosis, and its incidence is estimated to be 1/750-2000 (1-4). UPJO may cause hydronephrosis, urolithiasis, urinary tract infection, and end-stage kidney damage (5, 6). These complications can be prevented by early diagnosis and treatment. Therefore, ultrasonography (USG) and dynamic renal scintigraphy are frequently used for diagnosis and follow-up. Urinary USG is the first and most commonly used diagnostic method to evaluate the ureteropelvic junction (7-9). Dynamic renal scintigraphy is a non-invasive technique that is used to evaluate urinary system obstruction. Furthermore, it is commonly used to determine surgical intervention, clinical monitoring, and treatment effectiveness. It may also help distinguish transitory hydronephrosis cases from permanent ones (10, 11).

In this study, we aimed to assess demographical characteristics, ultrasonography (USG), and dynamic renal scintigraphy parameters of pyeloplasty and non-pyeloplasty patients with UPJO.

MATERIALS and METHODS

In this retrospective study, we enrolled 59 patients diagnosed with UPJO between 2015 and 2020 at a tertiary hospital. We excluded patients with insufficient data, ureteral dilatation, duplex kidney, fusion anomalies, solitary kidney, vesicoureteral reflux, and posterior urethral valve obstruction. This study was approved by the ethics committee of Health Sciences University Ankara Training and Research Hospital (482- 05/11/2020). We obtained written informed consent from all patients. The study was performed in accordance with the 1964 Declaration of Helsinki and its later amendments.

The demographic characteristics (such as age and sex) and clinical characteristics (such as UPJO location) of the patients were recorded. All patients who had undergone dynamic renal scintigraphy and renal USG for the diagnosis of UPJO were included in the study. Renal pelvis anteroposterior diameter (APD) was evaluated to USG and staged according to the Society for Fetal Urology (SFU) grading system. The maximum APD of the renal pelvis was measured on a transverse renal image. SFU grades 1 and 2 were considered low grades, and SFU grades 3 and 4 were high grades (12). For dynamic renal scintigraphy, adequately hydrated child were advised to void immediately prior to the renogram and the scintigraphic images were acquired with the patient supine on the imaging table for 40 minutes in the prone position. The acquisition was started after the injection of mercaptoacetyltriglycine (MAG 3) (TechneScan, Nepha, Ankara, Turkey) labeled with 99 mTc injected through the intravenous line. A furosemide dose of 1 mg/kg (maximum 20 mg) was injected through the intravenous line at 20th minute of the acquisition. During the diuresis phase, the patient was shifted to the prone position. In dynamic renal scintigraphy, time to reach maximum renal activity (Tmax), time to clear half of the maximum activity (T1/2), differential renal function (DRF), and diuretic responses were recorded. Tmax is the time period required to reach the maximum renal activity. Tmax<5 min is considered normal and Tmax>20 min is considered a very delayed transit (13). T1/2 is the time required for renal uptake to be reduced by 50.0%. T1/2<10 min is considered normal, T1/2 between 10 and 20 min is considered borderline or undetermined, and T1/2>20 min is considered an obstruction. Differential renal function (DRF) was evaluated between the first and second minutes after radioisotope injection and was expressed in terms of the extraction value. The normal level of extraction was between 45.0% and 55.0%. (5) Diuretic response of the renogram curve is graded as 1 when there is no response to furosemide; as 2 delayed excretion with partial response to furosemide; 3 delayed excretion with complete response to furosemide; 4 normal excretion with complete response to furosemide (14).

Finally, patients who underwent pyeloplasty identified and their data were recorded. Indications for pyeloplasty were based on the following protocol:

1. Worsening of hydronephrosis, characterized by an increase in the transverse APD of the renal pelvis with or without change (increase) of SFU grade on repeat ultrasounds,
2. Deterioration of differential renal function (DRF) >10% on repeated renal scans,
3. Initial renal function <40% associated with an obstructive (ascending) a curve on renogram,
4. Worsening of hydronephrosis associated with a T1/2 time >30 min,
5. Development of symptoms (sepsis, febrile urinary tract infections, stones) (15,16).

Statistical analysis

All statistical analyses were performed using the Statistical Package for the Social Sciences for Windows (version 21.0; IBM Corp, Armonk, NY). The Kolmogorov–Smirnov test was used to assess data normality. An independent samples t-test was used to compare the groups. Categorical variables were compared using the chi-squared test. Binary logistic regression analyses were used to assess factors influencing treatment modality (pyeloplasty vs. non-pyeloplasty). Receiver operating characteristic (ROC) curves were used to determine the cut off APD for selecting patients requiring pyeloplasty. Statistical significance was set at p <0.050, and odds ratios (ORs) and 95.0% confidence intervals (CIs) were determined.

RESULTS

A total of 59 patients diagnosed with UPJO were included. The mean patient age was 73.5±60.9 months. Thirty-seven (62.7%) patients were boys, and 22 (37.3%) patients were girls. Hydronephrosis was observed on the right-side in 24 (40.7%) patients and on the left side in 35 (59.3%) patients. In terms of the SFU grade, 23 (39.0%), 21 (25.6%), 13 (22.0%), and two (3.4%) patients had grades 1, 2, 3, and 4 hydronephrosis, respectively. In terms of the severity of hydronephrosis, 44 (74.6%) patients had low-grade hydronephrosis and the 15 (25.4%) patients had high-grade hydronephrosis.

Among the 59 patients, 13 (22.0%) underwent pyeloplasty. Eight of 13 patients who had pyeloplasty were diagnosed after 3 years of age. Of these patients, 2 had flank pain and hematuria, 3 had flank pain and urinary tract infection, and 3 had flank pain only. The patients undergone pyeloplasty based on symptomes and radiological findings. Other 5 patients were diagnosed in the antenatal period and undergone pyeloplasty as a result of worsening of hydronephrosis in the first year of life. Table I summarizes the characteristics of patients, overall and according to the groups (pyeloplasty group vs. non-pyeloplasty group).

The groups (pyeloplasty group vs. non-pyeloplasty group) did not differ in terms of age, sex, and side of hydronephrosis (p> 0.050) (Table I). However, the number of patients with high-grade hydronephrosis was significantly higher in the pyeloplasty group than in the non-pyeloplasty group (76.9% vs. 10.9%; p = 0.010) (Table I). In addition, the renal pelvis APD was significantly higher and Tmax and T1/2 were significantly longer in the pyeloplasty group than in the non-pyeloplasty group (p< 0.010) (Table I). Furthermore, the time to respond to diuretics was significantly lower in the pyeloplasty group than in the non-pyeloplasty group (p=0.010) (Table I).

Binary logistic regression analysis revealed that among the variables that differed significantly between the pyeloplasty and non-pyeloplasty groups, only increased renal pelvis APD was

Table I: Characteristics of patients with hydronephrosis, overall and according to the groups (pyeloplasty vs non-pyeloplasty)

Characteristic	Overall patients (n=59)	Pyeloplasty group (n = 13)	Non-pyeloplasty group (n = 46)	p
Age (months)*	73±61	82±73	71±58	0.570‡
Gender†				
Boy	37 (62.8)	10 (76.9)	27 (58.7)	0.330§
Girl	22 (37.2)	3 (23.1)	19 (41.3)	
Hydronephrosis side†				
Right	24 (40.7)	7 (53.8)	17 (37.0)	0.270§
Left	35 (59.3)	6 (46.2)	29 (63.0)	
Hydronephrosis grade†				
Low-grade	44 (74.6)	3 (23.1)	41 (89.1)	0.010§
High-grade	15 (25.4)	10 (76.9)	5 (10.9)	
Renal pelvis APD (mm)*	20±9	31±9	17±5	0.010‡
Tmax*	12±9	21±9	10±6	0.010‡
Time to response to diuretics (min)*	2.5±1.0	1.6±1.0	3.0±0.8	0.010‡
Differential renal function (%)*	49±10	44±11	50±10	0.090‡
$T_{1/2}$ time (min)*	25±17	43±19	20±12	0.010‡

:** *mean ± SD,* **†:** *n(%),* **‡:The Independent sample T test,* **§:** *Chi-square tests,* ***APD =*** *Anteroposterior diameter*

Table II: Binary logistic regression analysis of patients' characteristics with respect to pyeloplasty operation

Characteristic	OR	95% CI	p
Hydronephrosis grade	12.1	0.3 – 468.0	0.180
Renal pelvis AP diameter (mm)	1.2	1.0 – 1.4	0.030
Tmax	1.5	0.9 – 2.3	0.060
Time to response to diuretics (min)	0.5	0.1 – 3.6	0.490
Differential renal function (%)	0.8	0.6 – 1.0	0.170
$T_{1/2}$ time (min)	0.9	0.7 – 1.1	0.530

***OR** = Odds ratio, **CI** = Confidence interval*

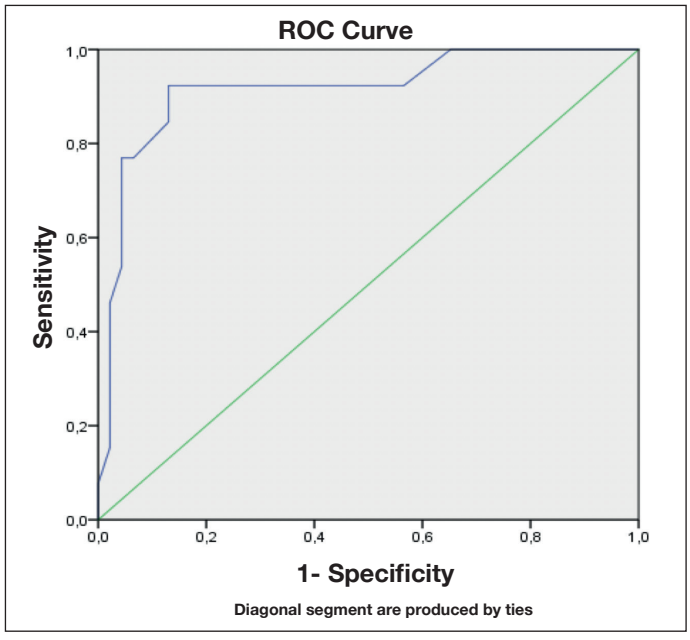

Figure 1: The Roc Curve analysis of the renal pelvis anteroposterior diameter for prediction pyeloplasty (area under the curve = 0.91; standard error = 0.05)

independently associated with pyeloplasty (p = 0.030; OR = 1.2) (Table II). ROC curve analysis revealed that the optimal cut off value of the renal pelvis APD for predicting pyeloplasty was 21.5 mm. The sensitivity and specificity were 84.0% and 87.0%, respectively (Figure 1).

DISCUSSION

UPJO is the most common congenital anomaly of the ureter and is the most common cause of antenatal and childhood hydronephrosis (17). USG is the first diagnostic procedure used to detect UPJO (5). Hydronephrosis can be detected by USG in UPJO. In a previous study, some cases were detected during the antenatal period, 65.8% cases completely regressed during follow-up without a decrease in DRF (18). Another diagnostic method is the dynamic renal scintigraphy, a safe and sensitive procedure to evaluate DRF and drainage over time (19). Many newborns and children may be asymptomatic until diagnosis. Therefore, detection during childhood is difficult (20). The silent clinical course and the socio-cultural environment may be the cause of delayed diagnosis. Hence, it is necessary to conduct an appropriate investigation at an appropriate time to visualize the urinary system and avoid unnecessary invasive procedures.

UPJO is more common in boys than in girls. It usually affects the left kidney (21). Schreuder et al. (22) claimed that this left-sided lateralization could be related to the development of the vasculature, differential gene expression profiles, or susceptibility to environmental factors, such as hypoxia. Consistent with the literature, 62.7% of the patients in our study were boys, and 59.3% of them had left kidney obstruction.

Different classifications have been used to grade renal pelvic dilatation. Most recently, Nguyen et al. (23) proposed a new urinary tract disorder (UTD) classification system. In this classification, there are six grades, stratified based on gestational age and whether the UTD is detected prenatally or postnatally. In contrast, the grading system proposed by the SFU emphasizes the extent of calyceal dilatation (24). It is still the most commonly used classification worldwide. In this study, we grouped patients according to the SFU grading system, and 25.4% of the patients had high-grade hydronephrosis. We claim that the SFU grading system demonstrated strong effectiveness in estimating the likelihood of pyeloplasty in our study. Furthermore, the frequency of pyeloplasty was seven times higher in the high-grade hydronephrosis group than in the low-grade hydronephrosis group.

In a study published by Arora et al. (25), it was reported that 23.9% of patients required pyeloplasty. The procedure was most commonly performed in patients with high-grade hydronephrosis. In our study, pyeloplasty was performed in 22.0% patients, and 76.9% of them had high-grade hydronephrosis; this finding is consistent with those of previous studies.

The most frequently used parameters to evaluate the extraction and excretion phases in dynamic renal scintigraphy are Tmax, T 1/2, and DRF (10). Krajewski et al. (5) emphasized the importance of T 1/2 longer than 20 minutes in determining significant obstruction. In the study by Çetin et al. (26), T1/2 was longer in the pyeloplasty group than in the other groups. In our study, T1/2 was significantly longer in the pyeloplasty group than in the non-pyeloplasty group (p=0.010). T1/2 time is a useful marker in determining the need for surgical intervention in patients with UPJO. In our study, it was used effectively in deciding on treatment in the pyeloplasty group.

DRF plays an important role in determining pyeloplasty in patients with UPJO. In a prospective study, Tabari et al. (27) assigned patients into two groups: early pyeloplasty and conservative management. In the early pyeloplasty group, there was a significant decrease in DRF results at 12th month. However, in the conservative management group, the renal function deteriorated both at 6th and 12th months. In a retrospective study, Yang et al. (28) reviewed 629 patients with UPJO. Patients were grouped into early pyeloplasty (DRF >40.0%) and late pyeloplasty (DRF <40.0%) groups. They found

that renal function was better in the early pyeloplasty group than in the late pyeloplasty group postoperatively. In our study, DRF was 44.5% in the pyeloplasty group and 49.6% in the non-pyeloplasty group, and the difference was not significant (p>0.090). Similar to the study by Yang et al. (28), the mean DRF was >40.0% in our pyeloplasty group. In our study, we did not categorize our patients as early or late pyeloplasty. However, we argue that the DRF value of >40.0% in the pyeloplasty group suggests that the procedure was performed at the correct time without compromising the kidney's differential function.

Prolongation of Tmax (>20 min) may indicate performing pyeloplasty in patients with UPJO (13). In our study, the mean Tmax was significantly higher in the pyeloplasty group than in the non-pyeloplasty group (21.4% vs. 9.8; p=0.010). Similar to our study, Khawaja et al. (29) reported that the mean preoperative Tmax was >19.0 in patients with UPJO. Although they found that Tmax was significantly decreased after pyeloplasty, we could not compare our preoperative and postoperative results because of insufficient data.

The role of APD in decision making regarding the performance of pyeloplasty in patients with UPJO has been evaluated in some previous studies. Mahmoud et al. (30) discovered that an initial APD measurement of 23 mm can effectively determine the need for surgery, boasting a specificity of 95% and sensitivity of 70%. In another study, Arora et al. (25) found that APD and pre-operative DRF were the only independent factors that predicted the need for surgery, whereas computer tomography and initial SFU grade of hydronephrosis were not. The analysis of the receiver operating curve indicated that an APD of 24.3 mm could predict the need for surgery, with a sensitivity of 73.1% and a specificity of 88.0%. Sharifian et al. (31) demonstrated that an APD of 15 mm could distinguish the surgical group with 95.2% sensitivity and 73.5% specificity. In another study, Wang et al. (32) demonstrated that both APD and renal parenchymal volume can predict the need for surgery, with an accuracy of 78.7%, sensitivity of 81.6%, and specificity of 77.6%. In our study, binary logistic regression analysis revealed that only increased renal pelvis APD was independently associated with pyeloplasty (p = 0.030; OR = 1.2). Furthermore, the optimal cut off value of the renal pelvis APD to predict pyeloplasty was 21.5 mm, with 84.0% sensitivity and 87.0% specificity.

This study has limitations. First, due to its retrospective nature, no comparison could be made with the postoperative period data. Second, since parenchymal thickness was not evaluated in patients, this parameter could not be included in the study.

Our findings suggest that both USG and dynamic renal scintigraphy are effective diagnostic methods for UPJO and surgical decisions. Renal pelvis APD at diagnosis detected on USG can be an easy and important parameter to follow-up the patient and make a reliable and immediate decision regarding surgery.

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Comprehensive Evaluation of Sibling Cases with Type 1 Diabetes

Tip 1 Diyabetli Kardeş Olguların Kapsamlı Bir Şekilde Değerlendirilmesi

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ABSTRACT

Objective: Type 1 diabetes mellitus (T1DM) is a polygenic disease influenced by genetic, environmental, immunological factors.There are few studies regarding siblings with T1DM.We aimed to evaluate the presentation, diagnosis, follow-up, sociodemographic characteristics of sibling T1DM cases.

Material and Methods: We retrospectively reviewed characteristics of sibling cases followed with T1DM between January 2005 and May 2017.

Results: The prevalence of T1DM sibling diabetes in our clinic was 5.9%.We included 17 siblings (a total of 34 cases) who had diagnosis and follow-up data. One of the siblings was a twin.There were no statistically significant differences between the ages at diagnosis, presenting symptoms, duration of symptoms before diagnosis, glucose/C-peptide values at diagnosis, average HbA1c values in the first five years of follow-up, or hospitalization rates in the first five-years post-diagnosis between the first and second diagnosed siblings.Despite having a child diagnosed with T1DM, 23.6% of families had a second child diagnosed with diabetic ketoacidosis.Variations in antibody positivity were observed among siblings, there were no similarities between celiac disease, Hashimoto's thyroiditis.Vitamin D levels were significantly lower in siblings diagnosed secondarily.

Conclusion: Our study is significant for being conducted at a reference center with a high number of diabetes patients under follow-up, for filling a gap in the literature with a detailed evaluation of sibling cases with T1DM.It serves as a comprehensive pilot study examining the manner, order of diagnosis, clinical, laboratory, and follow-up data of siblings with diabetes.There is a need for prospective studies with a larger number of sibling cases to further explore this topic.

Key Words: Type 1 diabetes mellitus, Diabetic siblings, Vitamin D

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Ethics Committee Approval / *Etik Kurul Onayı*: This study was conducted in accordance with the Helsinki Declaration Principles. This Study Dr. Sami Ulus Gynecology and Obstetrics and Gynecology Child Health and Diseases Training and Research Hospital is academically approved (5030/20.04.2016).

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ÖZ

Amaç: Tip 1 diyabetes mellitus (T1DM) genetik, çevresel ve immünolojik nedenlere bağlı poligenik bir hastalıktır. Kardeş T1DM'ler ile ilgili az sayıda çalışma vardır. Çalışmamızda, izlemimizdeki kardeş T1DM olguların başvuru, tanı, izlem, sosyodemografik özelliklerini değerlendirmeyi, olası ortak ve farklı özellikleri tespit etmeyi amaçladık.

Gereç ve Yöntemler: Ocak 2005-Mayıs 2017 arasında T1DM tanısı ile izlemimizde olan, kardeş olguların; başvuru, klinik, laboratuar, izlem, sosyoekonomik özellikleri retrospektif olarak dosya verilerinden tarandı.

Bulgular: Kliniğimizde T1DM kardeş diyabet sıklığı %5.9'du. Tanı ve izlem verileri olan T1DM'li 17 kardeş (toplam 34 olgu) çalışmaya dahil edildi. Kardeşlerden biri ikiz idi. İlk ve ikinci tanı alan kardeşlerin tanı yaşları, başvuru yakınmaları, tanı öncesi yakınma süreleri, tanıdaki glukoz/C-peptid değerleri, takipteki ilk beş yıl ortalama HBA1c değerleri, tanı sonrası ilk beş yıllık izlemde hastaneye yatış sayıları arasında istatistiksel olarak anlamlı fark saptanmadı. Evde T1DM tanılı çocuk olmasına rağmen, ailelerin %23.6'sında ikinci çocuğun da diyabetik ketosiadoz (DKA) ile tanı aldığı, T1DM'li kardeşler arasında antikor pozitiflikleri açısından farklılıklar olduğu, tanı-takipte Çölyak hastalığı-Hashimoto tiroiditi açısından benzerlik olmadığı, ikinci tanı alan kardeşlerin D vitamin düzeylerinin ilk tanı alan kardeşlerden anlamlı düzeyde düşük olduğu saptandı.

Sonuç: Çalışmamız; takipteki diyabetli hasta sayısının oldukça yüksek olduğu referans bir merkezde yapılmış olması, literatürde kardeş T1DM'ler ile ilgili detaylı bir değerlendirmenin bulunmaması, kardeş diyabetli olguların tanı alma şekli, tanı alma sırası, klinik, laboratuar ve izlem verilerinin değerlendirildiği kapsamlı bir pilot çalışma olması nedeni ile önemlidir. Konu ile ilgili daha fazla sayıda kardeş olgu ile yapılacak prospektif çalışmalara ihtiyaç duyulmaktadır.

Anahtar Sözcükler: Tip 1 diyabetes mellitus, Diyabetli kardeş, D vitamini

INTRODUCTION

Diabetes mellitus (DM) is a widespread, chronic, endocrine, metabolic disease characterized by biochemical elevation of blood glucose levels due to insufficient insulin secretion or ineffectiveness (1). This disrupts the balance in carbohydrate, protein, fat metabolism, ultimately leading to inappropriate high blood glucose levels during fasting and after meals, resulting in DM (2). Diabetes characterized by permanent insulin deficiency due to autoimmune damage to pancreatic beta cells is the most common type of diabetes in childhood and is referred to as type 1 diabetes mellitus (T1DM) (2).

T1DM is a complex autoimmune disease arising from the interaction of genetic and environmental factors (3). However, the exact contributions of these factors to the disease process remain unclear. Studies investigating the impact of these factors have focused on twin and sibling cases (4, 5). Even siblings raised in the same environmental conditions, identical twins with the same genetic makeup, siblings with the same disease can exhibit different courses and characteristics.

The evaluation of socio-economic, clinical, laboratory, follow-up data related to T1DM, especially among sibling cases, could generate new insights. There is currently a lack of detailed evaluation in the literature specifically focusing on sibling diabetes. Factors such as the frequency of diabetes among siblings, how siblings present for diagnosis, which sibling is diagnosed first (the period of disease onset), clinical course, metabolic control during follow-up have not been thoroughly assessed in the literature to date. Addressing these aspects could lead to new understandings and potentially improve management strategies for T1DM in familial contexts.

In our study, we aimed to evaluate various aspects of siblings with T1DM under follow-up. Specifically, we aimed to assess their clinical presentation at diagnosis, the sequence of diagnosis among siblings (period of disease onset), clinical course, initial laboratory findings upon presentation, metabolic control during follow-up, the potential impact of family education level on metabolic control. Additionally, our objective was to identify common and distinct characteristics among sibling diabetes cases.

MATERIAL and METHODS

Between January 1, 2005, and April 30, 2017, siblings diagnosed and followed-up with T1DM at our clinic were retrospectively screened from medical records. This Study Dr. Sami Ulus Gynecology and Obstetrics and Gynecology Child Health and Diseases Training and Research Hospital is academically approved (5030/20.04.2016).

The demographic characteristics, symptoms and their duration prior to presentation, sequence of diagnosis among siblings, anthropometric measurements at presentation, pathological findings on physical examination, glucose, insulin, C-peptide, hemoglobin A1C(HbA1c) levels at presentation and during follow-up, insulin antibodies (IAA), antibodies to glutamic acid decarboxylase (anti-GAD), islet cell antibody (ICA) levels at diagnosis and follow-up, 25-hydroxy vitamin D levels, clinical presentation at diagnosis (hyperglycemia, hyperglycemia with ketosis, ketoacidosis, etc.), length of hospital stays, treatments used at discharge and their doses (in units/kg/day for insulin), annual average HbA1c values were recorded in the study. Cases were also evaluated for honeymoon periods, celiac serology, and autoimmune thyroid diseases. Patients' medical and family histories, socio-economic characteristics were obtained from medical records.

The annual HbA1c values were calculated by averaging HbA1c measurements taken every three months and average HBA1c <7.5% was considered as good metabolic control, 7.6-9% as

moderate metabolic control, >9% as poor metabolic control (6). The honeymoon period is defined as an insulin dose of <0.5 units/kg/day (7).

The data were analyzed using SPSS version 23.0 for Windows (IBM Corp, Armonk, NY, USA). Descriptive statistics were reported as mean and standard deviation (SD) or median (minimum-maximum) for continuous variables, and as numbers and percentages for nominal variables. For non-normally distributed data, values were presented as median and interquartile range (IQR). The chi-square test was used to examine the relationship between two categorical variables. All clinical, laboratory, and endocrinological values were defined using descriptive statistics, and comparisons between parametric and nonparametric data were conducted using Student's t-test and Mann-Whitney U test, respectively. Spearman or Pearson correlation analyses were used to evaluate relationships between parameters. A 'p' value of <0.050 was considered statistically significant.

RESULTS

The frequency of sibling diabetes among all T1DM cases was 5.9%. Of the 40 cases diagnosed with T1DM (20 siblings in total), 34 cases with diagnostic and follow-up data (17 siblings in total) were included in the study. General characteristics of siblings with T1DM were given in Table I.

The median age at diagnosis was 8.8 years (IQR 4.3-12.5 years). There was no statistically significant difference between the ages at diagnosis of the first and second diagnosed siblings (p=0.580). Among the 17 sibling pairs, the older sibling was diagnosed first in 13 cases, the younger sibling was diagnosed first in three cases, and other cases were identical twins.

The median duration of symptoms before diagnosis was 8.5 (IQR 7-30) days. There was no statistically significant difference in the duration of symptoms between the first and the second diagnosed siblings (p=0.060).

There was also no significant difference between the first and the second diagnosed siblings in terms of the distribution of hyperglycemia, hyperglycemia with ketosis, and diabetic ketoacidosis (DKA) at diagnosis (p=0.270). Furthermore, there was no significant difference between the ages of siblings diagnosed with DKA (6.5±4.4) compared to those diagnosed with hyperglycemia/hyperglycemia with ketosis (9.3±4.5) (p=0.090).

In seven (41.2%) of the sibling pairs, both siblings were diagnosed with hyperglycemia, in three (17.2%), one sibling was diagnosed with hyperglycemia and one sibling was diagnosed with ketosis, in three (17.2%), one sibling was diagnosed with hyperglycemia and one sibling was diagnosed with DKA, and in four (23.6%), both siblings were diagnosed with DKA.

It was determined that among the second diagnosed siblings, there was a higher incidence of diagnosis with hyperglycemia. Conversely, the incidence of diagnosis with DKA was found to be lower among the second diagnosed siblings compared to the first diagnosed siblings.

The most common symptoms were polyuria and polydipsia. There was no statistically significant difference between the presenting complaints among the first and second diagnosed siblings.

The median duration between the diagnoses of two siblings was 5 years (IQR 2-7.3). Among the siblings, the duration between diagnoses was ≤12 months in three (17.7%) siblings, 13 months to 5 years in eight (47%) siblings, and >5 years in six (35.3%) siblings.

Three of the patients (8.8%) had a history of prematurity, and eight (23.5%) were born by C/S. Consanguinity was present in 29.4% (n=5) of the families. There was a family history of T1DM in 2 families (11.8%) and a history of T2DM in 14 families (82.4%). There were no significant differences between the first and second diagnosed siblings in terms of prematurity, birth by cesarean section, or duration of breastfeeding.

The evaluation based on the number of siblings and birth order of the cases is presented in Table II.

There was no statistically significant difference in height SDS, weight SDS, and BMI SDS between the first and second

Table I: General characteristics of siblings with Type 1 Diabetes

	T1DM	First Diagnosed	Second Diagnosed	p
Sex, n (%) 2 male siblings 2 female siblings 1 female 1 male	9 (53) 4 (23.5) 4 (23.5)			
Median age at diagnosis (IQR)	8.8 (4.3-12.5)	7 (5.3-11.5)	8.9 (3.5-14)	0.580*
Duration of symptoms before diagnosis, days median (IQR)	8.5 (7-30)	15 (7-30)	7 (7-15)	0.060*
Mode of diagnosis, n (%) Hyperglycemia Hyperglycemia with ketosis Diabetic ketoacidosis	 20 (58.8) 3 (8.8) 11 (32.4)	 9 (53) 1 (5.9) 7 (41.1)	 11 (64.7) 2 (11.8) 4 (23.5)	0.270†

**: Student t Test, †: Chi_square Test*

Table II: Evaluation of Sibling T1DM Cases According to Number of Siblings and Sibling Order

	1st child	2nd child	3rd child	4th child	5th child	6th child
1st siblings	T1DM	T1DM	Healthy			
2nd siblings	T1DM	T1DM				
3rd siblings	Healthy	Healthy	T1DM	T1DM		
4th siblings	T1DM	Healthy	T1DM			
5th siblings	Healthy	T1DM	Healthy	T1DM		
6th siblings	T1DM	T1DM				
7th siblings	T1DM	T1DM	Healthy	Healthy		
8th siblings	T1DM	T1DM				
9th siblings	T1DM	T1DM	Healthy			
10th siblings	T1DM	Healthy	T1DM	Healthy	Healthy	Healthy
11th siblings	Healthy	T1DM	T1DM			
12th siblings	T1DM	T1DM	Healthy			
13th siblings	T1DM	T1DM				
14th siblings	T1DM	T1DM	Healthy			
15th siblings	Unknown					
16th siblings	Unknown					
17th siblings	T1DM	Healthy	T1DM			

diagnosed siblings. While there were no significant differences found in glucose and C-peptide levels at diagnosis between the first and second diagnosed siblings, the second diagnosed siblings had significantly lower levels of 25-hydroxy vitamin D and HbA1c at diagnosis. There was no statistically significant difference in insulin doses at discharge and honeymoon periods between the first and second diagnosed siblings. However, the hospitalization duration was significantly shorter for the second diagnosed siblings, whereas there was no significant difference in the number of hospitalizations during follow-up (Table III).

No significant differences were found in the average HbA1c values during the first five-years of follow-up among the siblings. When examining the annual metabolic control, no significant differences were observed between the siblings in the first three years after diagnosis. However, in the fourth and fifth years, it was found that the metabolic control of the second diagnosed siblings deteriorated compared to the first diagnosed siblings.

The cases were evaluated for diabetes autoantibodies at diagnosis, revealing that 11.8% (n=4) tested positive for anti-insulin antibodies, 35.3% (n=12) for anti-GAD antibodies, and 35.3% (n=12) for anti-islet cell antibodies. During the five-year follow-up, it was observed that one case became negative for anti-islet cell antibodies, one for anti-insulin antibodies, and one for anti-GAD antibodies, while three cases became positive for GAD antibodies and one for islet cell antibodies.

In two siblings, one was positive for anti-insulin antibodies at diagnosis while the other was negative. In eight siblings, one was positive for anti-GAD antibodies at diagnosis while the other was negative. In four siblings, one was positive for anti-islet cell antibodies at diagnosis while the other was negative. Differences were found in antibody positivity among siblings. The only pair of siblings who tested positive for all three diabetes autoantibodies were twins.

While none of the siblings were diagnosed with celiac disease at the time of diagnosis, one case was diagnosed with celiac disease during follow-up, initially showing positive tissue transglutaminase (tTG) IgA (90.6 U/ml) at the time of diagnosis. This case had negative tTG IgG and EMA but was HLA-DQ2 positive. During follow-up, 26.5% (n=9) of the cases were diagnosed with Hashimoto's thyroiditis, 88.9% (n= 8) of the cases were girl. Thyroid function tests of two of the patients with Hashimoto's thyroiditis were also abnormal at the time they were diagnosed with T1DM.

The analysis indicated no significant difference in the occurrence of DKA at diagnosis between children of parents with higher education (high school and above) and those with lower education (middle school and below) (mothers p=0.7 and fathers p=0.860). However, children of mothers with elementary school education were found to be hospitalized significantly more frequently compared to children of mothers with middle and high school education (p=0.010). There was no significant correlation found between father's education level and duration of hospital stay after diagnosis or number of hospitalizations during follow-up. Similarly, there was no significant correlation found between parental education levels and average HbA1c levels during the first, second, third, fourth, and fifth years of follow-up.

While the monthly income of 10 of the families was at or below the minimum wage, the income of four of them was above the minimum wage. Three families did not provide monthly income information. No significant correlation was detected between

Table III: Anthropometric characteristics and laboratory data of siblings with T1DM at diagnosis

	All cases	First diagnosed siblings	Second diagnosed siblings	p*
Anthropometric characteristics†				
Body weight SDS	-1.26±0.94	-1.42±0.94	-1.13±0.96	0.44
Height SDS	-0.32±1.09	-0.57±1.14	-0.11±1.05	0.29
BMI SDS	-1.36±1.23	-1.72±1.49	-1.1± 0.9	0.18
Laboratory data‡				
Glucose (mg/dl)	476.1±239.2 (109-1008)	523±235 (269-1008)	432.5±243.3 (109-847)	0.34
C peptide (ng/ml)	1.67±4.76 (0.01-21.8)	2.94±7.62 (0.01-21.8)	0.83±0.59 (0.19-2)	0.46
HbA1c (%)	10.8±2.4 (5.6-14.9)	11.8±2.2 (7.4-14.9)	9.9±2.2 (5.6-12.8)	0.04
25-OH D vit (ng/ml)	18.8±9.7 (9.4-51.2)	23.1±11.2 (10.6-51.2)	14.1±4.9 (9.4-26.2)	0.03
Duration of hospital stay, insulin dose at discharge, honeymoon period and number of hospitalizations during follow-up				
Length of hospital stay at diagnosis (days)‡	17±6.5 (3-27)	20±5 (10-27)	14.6±6.7 (3-27)	0.03
Insulin dose at discharge dozu (U/kg/day)†	0.89±0.4	0.87±0.36	0.9±0.47	0.88
Honeymoon period (months)‡	5.3±7.6 (0-24)	3.5±7.43 (0-24)	6.7±7.8 (0-24)	0.31
Number of hospitalizations during follow-up‡	1.9±1.4 (1-6)	2.3±1.7 (1-6)	1.6±0.9 (1-4)	0.18

: Student t Test, †:mean±SD, ‡:mean±SD (min-max)

family income level and average HBA1c levels in the first, second, third, fourth and fifth years.

When comparing groups where the first sibling was diagnosed with DKA and the second sibling was diagnosed with hyperglycemia, with groups where both siblings were diagnosed with DKA, similarities were found in terms of parental education levels, income status, number of children in the family, and the duration between children's diagnoses.

DISCUSSION

In our study, we evaluated all aspects of siblings with T1DM who were followed up in our clinic over a 12-year period. Although T1DM is a multifactorial disease, it is noteworthy that having a sibling with T1DM increases the risk compared to the general population (8), which led us to conduct this study in our center.

There is no detailed evaluation of sibling diabetes in the literature. In our study, we found that family education and awareness of diabetes may vary despite having a sibling with diabetes, it may be important to keep the vitamin D levels of siblings with T1DM at adequate levels, and close monitoring is required for the development of diabetes in the sibling, especially in monozygotic twin T1DM cases.

In the model developed by Mrena et al. (5) to predict the likelihood of T1DM developing in siblings of 701 children newly diagnosed with T1DM, it was reported that in a 15-year follow-up period, T1DM developed in 6.7% of the siblings. The empiric rate of T1DM when identical twin affected is %30-70 and the risk in dizygotic twins is approximately the same as in non-twin siblings (8). In our study, the frequency of sibling diabetes for T1DM was 5.9% and there was one monozygotic twin sibling.

Harjutsalo et al. reported that a young age at diagnosis in the index case, a paternal history of diabetes starting at a young age, male gender, advanced parental age at birth significantly increase the risk of T1DM in siblings (9). Mrena et al. (5) reported that besides age and family history of T1DM, information regarding autoantibody status and levels, HLA-DR-associated disease susceptibility, insulin secretion and sensitivity are effective in evaluating the time to diagnosis of T1DM in siblings of children newly diagnosed with T1DM and predicting the progression risk to T1DM in those siblings.

At the time of diagnosis, 32% of cases presented with DKA. In the SEARCH study group's analysis of the temporal trends of the prevalence of DKA in diabetes diagnosis, it was reported that the prevalence of DKA in young-onset type 1 diabetes remained stable at approximately 30% between 2002 and 2010. However, there was an observed increase in prevalence from 35.3% to 40% between 2010 and 2016 (10,11). While it was reported that the rate of diabetic ketoacidosis at the time of diagnosis in Turkey was around 50%, this rate reached up to 80% in the eastern region of Turkey (12,13). In 2010, the Turkish Society of Pediatric Endocrinology and Diabetes has implemented a School Diabetes Program to increase teacher awareness (14). Similarly, in Italy, a successful campaign that educated teachers, students, parents, and pediatricians reduced the presentation rate with DKA from 78% to 12.5% over eight years (15).

In our study, no significant difference was found in the mode of diagnosis (hyperglycemia, hyperglycemia with ketosis, or DKA) between siblings who were diagnosed first and subsequently. However, siblings diagnosed secondarily showed a higher incidence of hyperglycemia and a lower incidence of DKA compared to those diagnosed initially. This difference was attributed to the families receiving diabetes education during hospital stays and routine outpatient clinic visits for their first diagnosed children. On the other hand, the lack of significant differences in terms of duration of complaints before diagnosis among siblings suggests that despite parental education, there

may be limitations in recognizing diabetes symptoms early enough.

When comparing sibling groups where the first sibling was diagnosed with DKA and the second with hyperglycemia versus groups where both siblings were diagnosed with DKA, we found similar parental education levels, income status, number of children in the family, and time elapsed between diagnoses. Despite these similarities, the occurrence of severe conditions like DKA in both siblings could not be directly linked to these factors. This suggests that factors beyond those we examined, such as the importance placed on diabetes by the family, their ability to cope with and accept the disease, and individual sensitivities, may play crucial roles. Therefore, there is a need for studies involving more heterogeneous groups and larger numbers of siblings to further explore these factors.

Several studies have examined the relationship between parental consanguinity and the development of T1DM. In a study conducted in Saudi Arabia have reported no association between parental consanguinity and the development of T1DM (16). In a study examining the clinical characteristics of T1DM in our country, parental consanguinity was reported as 15.5% (17). In our study, the consanguinity rate was 30%.

Ardicli et al. (17) reported that 14% of T1DM cases had a family history of T1DM and this rate was %53.4 for T2DM. In our study, 12% of the cases had family members with T1DM other than their siblings.

No significant differences were found in glucose and C-peptide levels between those diagnosed first and later. However, HbA1c levels were lower in siblings diagnosed later. The development of overt diabetes clinical symptoms occurs after a certain stage of pancreatic beta-cell destruction, which explains the lack of differences in glucose and C-peptide levels. The lower HbA1c in siblings diagnosed later may be associated with increased family experience and awareness, despite no differences being found in presenting symptoms and duration of symptoms in our study.

It was found that there was no difference in the mean HbA1c values among the sibling cases during follow-up. This could be associated with siblings consuming similar foods, consistent care and sensitivity shown for the diabetic child, stability in parental controls over the years, and siblings assisting each other in diabetes monitoring. Similarly, the absence of differences in hospitalization rates among siblings during the first five-years post-diagnosis in T1DM cases may be linked to their similar glycemic control. The lack of significant metabolic control changes over the years, or at least no deterioration, may demonstrate the family's resilience in coping with chronic illness.

The serological markers of beta cell autoimmunity associated with diabetes are anti-GAD, tyrosine phosphatase-like insulinoma antigen 2 (IA2), IAA, beta cell-specific zinc transporter 8 autoantibody (ZnT8) (18). The presence of these autoantibodies indicates developing autoimmune disease and can be detected in the serum many years before diabetes manifests (18). The expression of autoantibodies is age-dependent. In children under the age of ten, expression of IAA and ZnT8 is more prevalent, whereas GAD and IA-2 are more commonly seen in older individuals. Additionally, GAD autoantibody is more prevalent in females (19). In the literature, it has been reported that anti-GAD antibodies are found in approximately 70-80% of cases at the time of diagnosis, while IA-2 antibodies are detected in about 60% of cases (8). In our study, anti-insulin antibody positivity was 11.8%, anti-GAD antibody positivity was 35.3%, and islet antibody positivity was 35.3% at the time of diagnosis. There is no study in the literature examining autoantibody positivity among siblings with diabetes and while antibody positivities could be expected to be similar in siblings, differences were observed between sibling pairs in our study.

Mrena et al. developed a model to predict the risk of developing T1DM in siblings of children newly diagnosed with T1DM, where the presence and levels of autoantibodies were reported to be effective predictors. Among 701 children newly diagnosed with T1DM, 47 siblings developed T1DM, out of which 38 initially had at least one diabetes-related autoantibody positivity. Seven siblings initially negative for autoantibodies later became positive before diagnosis (5).

In our study, we found that siblings diagnosed later had significantly lower vitamin D levels compared to those diagnosed first. However, in a study conducted in Denmark, which examined the vitamin D levels of children newly diagnosed with T1DM and their healthy siblings, no significant differences were found in the vitamin D levels between the siblings (20). Literature includes studies showing that vitamin D supplementation during infancy reduces the risk of developing T1DM (21,22). Additionally, Şahin et al. investigated polymorphisms in the vitamin D receptor and susceptibility to T1DM and reported that the BsmI BB, BsmI Bb, TaqI tt polymorphisms are associated with increased risk of T1DM, whereas the BsmI bb and TaqI TT polymorphisms have a protective effect against the development of T1DM in children (23). Literature includes studies on the relationship between autoimmunity, T1DM, vitamin D, and immunomodulation; however, there is no clear recommendation regarding maintaining adequate vitamin D levels in siblings of children with T1DM.

When the relationship between the parental education level of the cases and metabolic control was examined, contrary to expectations, no improvement in metabolic control was detected as the family education level increased. This situation was thought to be related to the fact that diabetes education in our clinic is given by paying attention to the education level of each parent. At the same time, no correlation was found between parental education level and the severity of clinical conditions (hyperglycemia, ketosis, and DKA) at the time of diagnosis. Contrary to our study, in studies conducted in Italy, it

was reported that metabolic control deteriorated as the parental education level and socio-economic status decreased (24) and that children of mothers with higher education levels had a lower probability of experiencing DKA at the time of diabetes diagnosis (25).

Many studies have shown that low socioeconomic status is associated with poor glycemic control (24,26). In our study, the monthly income of 10 families was at or below the minimum wage, there was no significant correlation between family income level and average HBA1c levels in the first five-years. This finding, which is not compatible with the literature, may be associated with the fact that our center's tailored diabetes education based on family income and living conditions, and that patients with low socioeconomic levels try to cope with diabetes with the same determination. It was thought that the determining factor in glycemic control was not socioeconomic status but individuals' ability to cope with the disease.

This study has potential limitations: Despite examining personal and family history characteristics, diabetes autoantibodies at diagnosis, and even though siblings were from large families, we did not identify a factor that would predict the development of T1DM in siblings, apart from vitamin D levels and twin status. Although our study was conducted in a large center where a substantial number of diabetic patients were followed, the limited number of sibling diabetes cases may have prevented the determination of these factors.

In conclusion, our study is important for several reasons: it was conducted in a reference center where the number of diabetic patients is significantly high, there is a lack of detailed evaluation of sibling T1DM in the literature, and it represents a comprehensive pilot study evaluating the manner of diagnosis, sequence of diagnosis, clinical, laboratory, and follow-up data of sibling diabetic cases. Consequently, there is a need for prospective studies involving a larger number of sibling cases. Our study suggests that among sibling diabetic cases, particularly noteworthy topics include the evaluation of vitamin D levels and the support system among siblings during diabetes management.

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Investigating the Level of Knowledge of Pediatricians and Pediatric Residents About Peer Bullying in Children

Pediatri Asistanları ve Uzmanlarının, Çocuklarda Akran Zorbalığı ile İlgili Bilgi Düzeylerinin Araştırılması

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ABSTRACT

Objective: In this study, it was aimed to evaluate the level of knowledge and approaches of pediatricians and pediatric residents, who have a key role in the recognition and prevention of peer bullying.

Material and Methods: Pediatricians and pediatric residents working in Ankara provincial center were included in the study and their level of knowledge about peer bullying was evaluated.

Results: It was found that nearly half of the pediatricians and pediatric residents (48.9%, n=152) observed peer bullying during their professional lives. However, their level of knowledge on this issue was found to be insufficient and only 15.8% (n=49) of the participants stated that they knew how to approach peer bullying. It was determined that 15.4% of the participants (n=48) knew the risk factors related to peer bullying and among those who knew, the number of pediatricians (n=30) were more than pediatric residents (n=18). In our study, it was observed that only 4.8% of the participants (n=15) received training on peer bullying.

Conclusion: Families, teachers, school administrators and physicians have critical duties in relation to peer bullying, which is common all over the world and in our country. Among these groups, it is especially important for pediatricians to have sufficient knowledge and awareness by receiving trainings on the subject, to be able to detect the symptoms of peer bullying at an early stage and to effectively carry out the necessary interventions to reduce the number of bullying victims.

Key Words: Bullying, Knowledge, Pediatrician

ÖZ

Amaç: Bu çalışmada akran zorbalığının tanınması ve önlemek amacıyla yapılması gerekenler konusunda önemli rolü olan pediatri asistanları ve uzmanlarının bu konu hakkındaki bilgi düzeyleri ile yaklaşımlarının değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntemler: Araştırmaya Ankara il merkezinde çalışan pediatri asistanları ve uzmanları dahil edilerek hekimlerin akran zorbalığı konusundaki bilgi düzeyleri değerlendirildi.

Bulgular: Pediatri asistanları ve uzmanlarının yaklaşık yarısının (%48.9, n=152) meslek hayatları boyunca akran zorbalığına tanık oldukları tespit edilmiştir. Ancak bu konudaki bilgi düzeyleri yetersiz bulunmuş olup katılımcıların sadece %15.8'i (n=49) akran zorbalığına nasıl yaklaşacaklarını bildiklerini ifade etmiştir. Katılımcıların %15.4'ünün (n=48) akran zorbalığı ile ilgili risk faktörlerini bildiği ve bilenler arasında pediatri uzmanlarının sayısının (n=30) pediatri asistanlarından (n=18) daha fazla olduğu belirlenmiştir. Çalışmamızda katılımcıların sadece %4.8'inin (n=15) akran zorbalığı konusunda eğitim aldığı görülmüştür.

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Contribution of the Authors / Yazarların katkısı*: *ŞEKER YIKMAZ H: Constructing the hypothesis or idea of research and/or article. Planning methodology to reach the Conclusions. Organizing, supervising the course of progress and taking the responsibility of the research/study. Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments. Taking responsibility in logical interpretation and conclusion of the results. Taking responsibility in necessary literature review for the study. Taking responsibility in the writing of the whole or important parts of the study. Reviewing the article before submission scientifically besides spelling and grammar. ***ÇUHACI ÇAKIR B:*** Constructing the hypothesis or idea of research and/or article. Planning methodology to reach the Conclusions. Organizing, supervising the course of progress and taking the responsibility of the research/study. Taking responsibility in logical interpretation and conclusion of the results. Taking responsibility in the writing of the whole or important parts of the study. Reviewing the article before submission scientifically besides spelling and grammar. ***DUYAN ÇAMURDAN A:*** Constructing the hypothesis or idea of research and/or article. Planning methodology to reach the Conclusions. Organizing, supervising the course of progress and taking the responsibility of the research/study. Reviewing the article before submission scientifically besides spelling and grammar.

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Sonuç: Tüm dünyada ve ülkemizde sık görülmekte olan akran zorbalığı ile ilgili olarak aileler, öğretmenler, okul yöneticileri ve hekimlere kritik görevler düşmektedir. Bu gruplar arasında özellikle çocuk hekimlerinin konuyla ilgili eğitimler alarak yeterli bilgi ve farkındalığa sahip olmaları, akran zorbalığının belirtilerini erken dönemde tespit edebilmeleri ve zorbalık mağdurlarının sayısını azaltmak için gerekli müdahaleleri etkin bir şekilde yapabilmeleri açısından çok önemlidir.

Anahtar Sözcükler: Zorbalık, Bilgi, Çocuk hekimi

INTRODUCTION

Peer bullying is defined by Olweus as "consistent negative behavior by one or more students towards another student without provocation" (1). In order for an action to be called bullying, it is necessary that the behaviors against the other individual are done willingly and intentionally with the aim of harming, the action must be continuous, there must be a physical or psychological power imbalance between the victim and the bully, and the bullied person must feel psychologically or physically helpless (1).

The prevalence of peer bullying is increasing among children and has become an important problem for all countries. According to UNICEF, 33% of children in Turkey have been bullied by the age of 11 (2).

Bullying can be in the form of verbal harassment or physical harassment, exclusion, isolation, spreading false rumors, engaging in sexually disturbing behaviors, damaging their belongings or digitally. In addition to these types of bullying, there are also types of bullying based on race, ethnicity and immigration (3).

Bullying is affected by physical, biological and psychological characteristics of the individual and variables such as family structure and environment. Students with poor family and friend relationships, a history of domestic violence and abuse, low socioeconomic status, physical disability, chronic illness, learning disabilities, behavioral problems, different appearance, being overweight or too thin, and differences in sexual orientation are at risk for peer bullying and peer violence at school (4). Among these students, it is necessary to focus on those with warning signs of bullying, such as mood disorders, psychosomatic or behavioral symptoms, substance abuse, self-harming behaviors, suicidal ideation or suicide attempts, decline in academic performance, and reports of truancy (4).

When the literature is examined, it is seen that there are not many studies showing the awareness and knowledge levels of physicians about peer bullying. In this study, we aimed to determine the level of knowledge about peer bullying among pediatricians and pediatric residents who frequently encounter children who are subjected to peer bullying.

MATERIAL and METHODS

The cross-sectional study included a total of 311 participants, 163 of whom were pediatric residents and 148 of whom were pediatricians, working in private and public hospitals, city hospitals, training and research hospitals and university hospitals. At the beginning of the study, the participants were informed and their consent was obtained, and a structured questionnaire form consisting of 28 questions was administered via face-to-face interview or online survey.

The study was carried out with the permission of Ethics Commission of the Gazi University Faculty of Medicine (Decision No:2024 - 651). The research adhered to the ethical rules and the principles of the Declaration of Helsinki.

Data collection survey

The survey form consists of two parts. The first part includes questions about the sociodemographic characteristics of the participants, and the second part includes questions about participants' knowledge levels and awareness about peer bullying.

Statistical analyses

The research data were analyzed using the IBM Statistical Package for the Social Sciences, version 23.0 (SPSS Inc., Armonk, NY, IBM Corp., USA). In the descriptive statistics section, categorical variables were analyzed as percentages and numbers. Chi-square test was used for the comparison of categorical variables and the statistical significance level was accepted as $p<0.050$ in this study.

RESULTS

Among the physicians who participated in the study, 47.6% (n=148) were pediatricians, 52.4% (n=163) were pediatric residents, and 68.2% (n=212) were female (Table I). When the age groups were analyzed, it was seen that the majority of the participants were between the ages of 20-29 (n=116, 37.3%) and 30-39 (n=112, 36%). It was observed that 36% (n=112) of the participants had 1-4 years of medical experience, 27.7% (n=86) 5-9 years, 11.2% (n=35) 10-19 years and 25.1% (n=78) 20 years or more. Considering the institutions where the participants worked, city hospitals (38.3%, n=119) were in the first place and training and research hospitals (26%, n=81) were in the second place.

When the answers given by the participants to the questions aimed at determining their past training and experiences on peer bullying were analyzed, it was found that only 4.8% (n=15) of the participants received training on peer bullying, 5 of the 15 people who received training were pediatric residents and 10 were pediatricians (Table II). Among the participants who received training, 7 participants stated that they received this

Table I: Sociodemographic characteristics of the participants

Sociodemographic characteristics (n=311)	n (%)
Gender	
Female	212 (68.2)
Male	99 (31.8)
Age (year)	
20-29	116 (37.3)
30-39	112 (36.0)
40-49	62 (19.9)
50 and above	21 (6.8)
Duration of practice	
1-4 year	112 (36.0)
5-9 year	86 (27.7)
10-19 year	35 (11.2)
20 years and more	78 (25.1)
Institution	
State hospital	54 (17.4)
University hospital	29 (9.3)
Private hospital	28 (9.0)
City hospital	119 (38.3)
Training and research hospital	81 (26.0)
Title	
Pediatric resident	163 (52.4)
Pediatrician	148 (47.6)

training in the medical faculty, 3 received it in residency training, 2 received it in congresses, and 1 received it in courses, media and doctoral programs. However, 90% of the participants (n=280) stated that they wanted to receive training on peer bullying.

Nearly half of the participants (48.9%, n=152) reported that they had encountered pediatric patients exposed to peer bullying during their professional lives. While 15.8% (n=49) of the participants stated that they knew how to approach peer bullying, 20.6% (n=64) stated that they screened their patients for problems related to peer bullying during health visits. Total 29.9% (n=93) of the participants also stated that they screened patients who were exposed to peer bullying or identified as bullies for psychiatric comorbidities (Table II).

It was determined that only 15.4% (n=48) of the participants knew the risk factors for peer bullying. In the question where 3 of the risk factors for peer bullying were asked to be specified, only 13.5% (n=42) of the participants correctly specified 3 risk factors. In the answers given to this question, the risk factors were age, gender, socioeconomic level, parents being separated, domestic problems, having different appearance, having psychiatric problems, having developmental and mental retardation, having chronic diseases, having speech disorders, personality traits, parental attitude, substance-tobacco-alcohol use, academic failure, lack of psychological consultant and advisory teachers at school, presence of aggressive and disobedient students in the same or higher grades, poor education system, entering a new environment, lack of communication and lack of awareness on this issue.

Table II: Training and experience of physicians on peer bullying

Training and experience (n=311)	n (%)
Status of receiving training on peer bullying	
Yes	15 (4.8)
No	296 (95.2)
Willingness to receive training on peer bullying	
Yes	280 (90.0)
No	31 (10.0)
Knowing approach to peer bullying	
Yes	49 (15.8)
No	262 (84.2)
Screening for peer bullying issues	
Yes	64 (20.6)
No	247 (79.4)
Psychiatric screening of patients exposed to peer bullying	
Yes	93 (29.9)
No	218 (70.1)
Encountering a patient subjected to peer bullying	
Yes	152 (48.9)
Physical peer bullying	78 (51.3)
Relational/emotional peer bullying	75 (49.3)
Verbal peer bullying	113 (74.3)
Sexual peer bullying	14 (9.2)
Cyber peer bullying	14 (9.2)
Religious or race-based peer bullying	15 (9.9)
Theft	9 (5.9)
Forcibly taking goods or money	12 (7.9)
No	159 (51.1)
Knowing risk factors for peer bullying	
Yes	48 (15.4)
No	263 (84.6)
Intervention for a patient subjected to peer bullying (n=152)	
I met with the patient's family.	74 (48.7)
I referred the patient to a psychologist.	45 (29.6)
I referred the patient to a child psychiatrist.	116 (76.3)
I referred the patient to a social worker.	20 (13.2)
I counseled the patient.	26 (17.1)
I gave the patient and his/her family reading materials on combating bullying.	7 (4.6)
I called the patient's advisory teacher.	9 (5.9)
I screened the patient for depression/suicidal tendencies.	22 (14.5)
I documented the patient's bruises and signs of physical abuse.	23 (15.1)

The physicians (n=152) who stated that they had encountered patients subjected to peer bullying were asked additional questions about what type of peer bullying they encountered in their patients and how they intervened. In response to the question of what type of peer bullying the patient was subjected to, 74.3% (n=113) of the respondents answered that verbal peer bullying was the most common type of peer bullying (Table II).

Physicians (n=152) who encountered peer bullying were asked what kind of interventions they made regarding their patients who were subjected to peer bullying; n=74 (48.7%) interviewed the patient's family, n=45 (29.6%) referred the

Table III: Comparison of pediatric residents and pediatricians in terms of training and experience on peer bullying

	Pediatric resident (n=163)*	Pediatrician (n=148)*	p†	χ^2
Receiving training	5 (3.1)	10 (6.8)	0.129	1.566
Willingness to receive training	151 (92.6)	129 (87.2)	0.155	2.018
Knowing the approach	27 (16.6)	22 (14.9)	0.799	0.169
Screening for bullying	38 (23.3)	26 (17.6)	0.211	1.567
Knowing risk factors for bullying	18 (11.0)	30 (20.3)	0.036	4.738

**: n(%), †: Chi-square test*

Table IV: Comparison of training and experience of physicans by gender

	Female (n=212)*	Male (n=99)*	p†	χ^2
Receiving training	8 (3.8)	7 (7.1)	0.256	1.506
Willingness to receive training	202 (95.3)	78 (78.8)	<0.001	18.664
Knowing the approach	35 (16.5)	14 (14.1)	0.738	0.135
Screening for bullying	49 (23.1)	15 (15.2)	0.142	2.153
Knowing risk factors for bullying	34 (16.0)	14 (14.1)	0.793	0.186

**: n(%), †: Chi-square test*

Table V: Participants' knowledge about peer bullying

	Yes*	No*	I do not know*
Peer bullying is when two students with the same power fight.	113 (36.4)	132 (42.4)	66 (21.2)
It is considered bullying if the bullies ridicule and nickname the victim once.	270 (86.8)	30 (9.6)	11 (3.6)
Teasing a child in a playful and friendly way is peer bullying.	117 (37.6)	139 (44.7)	55 (17.7)
The degree of peer bullying is lower in the early years and higher in the final grades of each school period (level).	152 (48.9)	82 (26.4)	77 (24.7)
Bullies usually have low academic achievements, while victims have high academic performance.	168 (54.0)	66 (21.2)	77 (24.8)

**: n(%)*

patient to a psychologist, n=116 (76.3%) referred the patient to a child psychiatrist, n=20 (13.2%) referred the patient to a social worker, n=26 (17.1%) counseled the patient, n=7 (4.6%) provided the patient and his/her family with reading materials on combating bullying, n=9 (5.9%) called the patient's counselor, n=22 (14.5%) screened the patient for depression/suicidal tendencies, and n=23 (15.1%) documented the patient's bruises and traces of physical abuse.

There is no significant difference between pediatricians and pediatric residents in the answers given to the questions about the participants' status of receiving bullying training, willingness to receive training, knowing the intervention approach to bullying and screening for bullying. However, there was a significant difference between pediatricians and pediatric residents in the answers regarding whether they knew the risk factors for peer bullying (p=0.036, χ^2=4.738), and the proportion of pediatrician participants who knew about these issues was higher than that of residents (20.3% and 11.0%, respectively) (Table III). When the responses to the same questions were compared between men and women, a significant difference was found between men and women only in the question of the desire to receive training (p<0.001, χ^2=18.664). It was found that women were more likely than men (95.3% vs. 78.8%) to want to receive peer bullying education (Table IV).

Among the questions asked to measure the level of knowledge about peer bullying of the pediatricians and pediatric residents who participated in the study, 36.4% (n=113) of the participants accepted the false judgment that "Two students with the same power fighting is peer bullying" as true, 42.4% (n=132) considered it as false, and 21.2% (n=66) stated that they did not know this definition. The question with the highest percentage (86.8%, n=270) of incorrect answers was "It is considered bullying if the bullies ridicule and nickname the victim once" (Table V).

When the participants were asked about their opinions about the age of the peer bully, it was observed that the participants predominantly responded that the bullies were the same age (n=144) or older (n=146) than the victims (Table VI). The majority of the participants (83%) answered school and 11.6% answered social media to the question about where peer bullying is most common. While 72.3% of the participants were of the opinion that bullying was more often committed by boys, in the responses regarding the gender of bullying victims, the idea that girls were more likely to be victims of bullying than boys (48.6%, 42.8% respectively) came to the foreground. There was a statistically significant difference (p<0.001) between female and male participants in the responses to this question, with 56.6% of female participants stating that girls were victims,

Table VI: Participants' thoughts on peer bullying

Thoughts (n=311)	n (%)
Thoughts on the age of peer bullying	
Bully is older than the victim	146 (46.9)
Age of the bully same as the victim	144 (46.3)
Bully is younger than the victim	7 (2.3)
No opinion	14 (4.5)
Thoughts on where peer bullying is most likely to occur	
School	258 (83.0)
Social media	36 (11.6)
Other	8 (2.6)
No opinion	9 (2.8)
Thoughts on which gender is more likely to bully	
Girls	62 (19.9)
Boys	225 (72.3)
No opinion	24 (7.8)
Thoughts on which gender is more exposed to bullying	
Girls	151 (48.6)
Boys	133 (42.8)
No opinion	27 (8.7)
Thoughts on which grade is more prevalent to peer bullying	
Primary school	46 (14.8)
Secondary school	113 (36.3)
High school	142 (45.7)
No opinion	10 (3.2)
Thoughts on how bullying most often happens	
Verbal	217 (69.8)
Relational/emotional	56 (18.0)
Other	32 (10.3)
No opinion	6 (1.9)

while 60.6% of male participants stated that boys were victims of bullying. In the answers given regarding the school level at which peer bullying is more common, it was stated that it is more common at higher levels such as high school (primary school: 14.8%, n=46, secondary school: 36.3%, n=113, high school: 45.7%, n=142). Regarding the most common type of bullying, 69.8% (n=217) of the participants answered verbal peer bullying and 18% (n=56) answered relational emotional peer bullying.

DISCUSSION

Peer bullying is frequently observed among students in schools all over the world and in our country. In a meta-analysis in which 80 studies were analyzed to determine the frequency of peer bullying, the frequency of peer bullying in adolescents was found to be 35% (5).

In the literature, there are few studies investigating the knowledge levels and approaches of physicians on peer bullying. In our study, 48.9% of physicians reported that they had encountered a child patient who was subjected to peer bullying during their professional life, whereas in a study conducted in our country in 2021, 11.5% of family physicians and 33% of pediatricians were reported to have encountered a child subjected to peer bullying (6). Since our study included pediatricians, we thought that the incidence of peer bullying may have been higher.

In a study conducted by Pişkin in which 1154 primary school students participated, it was found that 30.2% of the students were bullies, 35% were victims, and 6.2% were in the role of bully/victim (7). It was determined that verbal bullying was the most common type of bullying, followed by physical bullying. In our study, it was observed that the most common type of bullying experienced by peer bullies was verbal bullying.

Mohseny et al. (8) stated in their study that boys were more victimized and bullied more than girls. But, in some countries/cultures the opposite is also observed (9). In a study conducted with high school students, it was found that students exposed to bullying did not differ according to gender (10). In our study, physicians reported that 48.6% of the victims of peer bullying were girls.

In terms of school achievement, it was found that both bullies and victims had lower school engagement than their peers who had never been involved in bullying. Bullies generally had low academic achievement, while victims sometimes had low and sometimes high academic achievement (11). In a study conducted by Kelleci et al. (12), it was determined that adolescents who did not perceive their academic achievement as good were more exposed to peer bullying. In our study, most of the physicians (n=168, 54%) stated that bullies generally have low academic achievement, while victims have high academic achievement.

In general, as students advance in grade level and age, their probability of experiencing bullying tends to decrease. However, there are some studies showing that the opposite trend is sometimes observed in certain countries or cultures (9). Tural et al. (13) found that both bullying and victimization rates decrease in the last two grades of high school. In our study, 45.7% of the participants stated that peer bullying was most common in high schools.

In a study, bullying predominantly occurred when there was no direct supervision, notably in the cafeteria (31.4%), hallways/stairwells (27.5%), and during break times on the playground/athletic field (26.5%) (14). In our study, physicians stated that the age of the bully was older than the victim in 46.9% of those who were bullied and 83% stated that bullying was most common at school.

It is recommended that physicians should know and suspect risk factors related to peer bullying and conduct screening in this regard. Parental concerns such as the child suddenly being in need of more money for lunch, having aggressive outbursts or exhibiting unexplained physical injuries should also be considered as clues for screening (4,15). Based on this

information, especially primary care physicians and pediatricians should be aware of situations related to peer bullying. In our study, only 48 people (15.4%) stated that they knew the risk factors, and 42 of them (13.5%) were able to specify 3 risk factors.

The American Academy of Pediatrics recommends addressing the issue of bullying at the 6-year-old well-child visit (a typical age for entry into primary school) (16). Physicians should ask indirect, open-ended questions to increase identification of children who bully or are bullied (17,18). Questions about the online lives of children and adolescents should also be included. Patients who are bullied or identified as bullies should be screened for psychiatric comorbidities (19, 20). In our study, 262 (84.2%) of the participants knew how to approach someone who was bullied, while 49 (15.8%) did not. Total 247 (79.4%) participants stated that they did not screen for problems related to peer bullying, while 218 (70.1%) stated that they did not perform psychiatric screening.

CONCLUSION

In conclusion, it is observed that the physicians who participated in our study do not know enough about peer bullying. This may be due to the fact that pediatricians and pediatric residents do not receive any training on peer bullying. In our study, it was found that the number of physicians who received training on peer bullying was quite low (4.8%). Therefore, it is important to increase the level of awareness of our physicians about exposure to peer bullying, which is observed in a significant number of children and adolescents, and to provide trainings to physicians on the subject so that they can provide counseling to their patients and their families. We believe that these trainings will be an important step in early detection of children who are victims of bullying and in conducting the necessary intervention and reducing the number of bullying victims. It would be very useful and important for pediatricians and residents to question peer bullying, which is known to have many negative consequences, in their clinical practice.

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Childhood Vaccination and Vaccine Hesitancy: A Comparison Between Türkiye and the World

Çocukluk Çağı Aşıları ve Aşı Tereddütü: Türkiye ve Dünya'nın Karşılaştırması

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ABSTRACT

Vaccination is the cheapest, safest, and most successful public health approach to protect children's health and prevent infectious diseases. High vaccination rates ensure community immunity and prevent epidemics. A drop in immunization rates below 95% can lead to outbreaks of vaccine-preventable diseases, particularly measles, as well as increased morbidity and mortality. With the recent emergence of vaccine hesitancy (VH) and vaccine refusal (VR) concepts, especially in developed countries, the number of unvaccinated children is increasing both in our country and around the world. Vaccine hesitancy stems from many personal and environmental reasons, as well as sociocultural, environmental, economic, and political reasons. Lack of information about vaccines, fear of side effects, concerns about vaccine efficacy and safety, the idea that vaccines are harmful, anti-vaccine publications on the internet and social media, belief in natural immunity, and religious reasons are seen as the most common reasons for VH and VR in different studies. Raising awareness in society about the importance and necessity of vaccination, identifying the factors that lead to VH, and producing solutions are among the primary measures to be taken. Healthcare personnel play a very important role in the fight against vaccine hesitancy. It is important to establish good, effective, and trusting communication with vaccine-hesitant parents. Recently, in addition to vaccine refusal cases, the number of families refusing vitamin K and heel blood sampling has been increasing. Vaccine refusal, and refusal of health care services will increase neonatal and childhood morbidity and mortality. Legal measures should be taken to protect the best interests of the child. Valid and reliable scales that evaluate parents' vaccine acceptance and hesitancy will be a source of information in the fight against vaccine hesitancy.

Key Words: Vaccine, Vaccination, Vaccine hesitancy, Vaccine refusal, Vitamin K refusal

ÖZ

Aşılama, çocuk sağlığını korumak ve bulaşıcı hastalıkları önlemek için en ucuz, en güvenli ve en başarılı halk sağlığı yaklaşımıdır. Yüksek aşılama oranları sayesinde toplum bağışıklığı sağlanır ve salgınlar önlenir. Bağışıklama oranlarında %95'in altına düşmesi, özellikle kızamık olmak üzere aşı ile önlenebilir hastalıkların salgınlarına ve artan morbidite ve mortaliteye yol açabilir. Son zamanlarda özellikle gelişmiş ülkelerde aşı tereddüdü ve aşı reddi kavramlarının ortaya çıkmasıyla birlikte, hem ülkemizde hem de dünya çapında aşılanmamış çocuk sayısı artmaktadır. Aşı tereddüdü, birçok kişisel ve çevresel nedenin yanı sıra sosyokültürel, toplumsal, ekonomik ve politik nedenlerden kaynaklanmaktadır. Aşılar hakkında bilgi eksikliği, yan etki korkusu, aşı etkinliği ve güvenliğiyle ilgili endişeler, aşıların zararlı olduğu düşüncesi, internette ve sosyal medyadaki aşı karşıtı yayınlar, doğal bağışıklığa inanç ve dini nedenler, farklı çalışmalarda aşı tereddütü ve aşı reddinin en yaygın nedenleri olarak görülmektedir. Toplumda aşılamanın önemi ve gerekliliği konusunda farkındalık yaratmak, aşı tereddütüne yol açan faktörleri belirlemek ve çözümler üretmek alınacak öncelikli önlemler

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arasındadır. Sağlık personeli aşı tereddüdüyle mücadelede çok önemli bir rol oynamaktadır. Aşı tereddüdü olan ebeveynlerle iyi, etkili ve güvenilir bir iletişim kurmak önemlidir. Son dönemde aşı redlerine ek olarak K vitamini uygulamasını, topuk kanı alımasını reddeden ailelerin sayısı da giderek artmaktadır. Aşı reddi ve sağlık hizmetlerinin reddi, yenidoğan ve çocukluk çağı morbidite ve mortalitesini artıracaktır. Çocuğun yüksek yararını gözetecek şekilde yasal önlemler alınması elzemdir. Ebeveynlerin aşı kabulünü ve tereddüdünü değerlendiren geçerli ve güvenilir ölçekler aşı tereddüdüyle mücadelede bilgi kaynağı olacaktır.

Anahtar Kelimeler: Aşı, Aşılama, Aşı tereddütü, Aşı reddi, K vitamini reddi

INTRODUCTION

The significance of vaccination

Vaccination is a very important and effective public health practice in protecting and improving the health of children and adults, preventing the spread of infectious diseases, reducing mortality and morbidity from vaccine-preventable diseases (VPDs), and strengthening health systems. Vaccination provides both individual and community immunity, making it essential to achieve high vaccination rates (1, 2). The implementation of efficacious vaccination programs have resulted in the global eradication of smallpox, and the near-eradication of polio. The majority of VPDs have been effectively controlled, leading to a notable reduction in morbidity and mortality on a global scale (3).

According to the World Health Organization's 2023 report, vaccination prevents 3.5 to 5 million deaths each year due to diseases such as diphtheria, tetanus, pertussis, measles, and influenza. As vaccination rates reach their targeted levels, this number is expected to increase. Currently, 19.4 million children in the world have not received the vaccines appropriate for their age, and resulting in approximately 1 million deaths from vaccine-preventable diseases (VPDs). Unfortunately, 30% of deaths in children under the age of five are due to VPDs (4).

Expanded Immunization Program

The Expanded Programme on Immunization (GBP/EPI) was established in 1974 by the World Health Organization (WHO) to expand routine childhood vaccinations worldwide and is celebrating its 50th anniversary today. Since then, coverage with three doses of diphtheria-tetanus-pertussis-containing vaccines (DTP, DTaP) increased from around 5% to almost 85% globally (5). In this process, the number of VPDs has increased to more than 30. The number for which the WHO recommends vaccination in all countries was seven (smallpox, tuberculosis, diphtheria, tetanus, pertussis, poliomyelitis, and measles) in 1974. By 2024, the EPI has been expanded to include vaccinations against 13 VPDs including tuberculosis, COVID-19, diphtheria, hepatitis B, H influenzae type B, human papillomavirus, measles, rubella, invasive pneumococcal disease, pertussis, polio, rotavirus, and tetanus; and more than 17 context-specific VPDs including cholera, dengue fever, hepatitis A, influenza, Japanese encephalitis, malaria, meningitis, mpox, mumps, rabies, respiratory syncytial virus, typhoid, tick-borne encephalitis, varicella, yellow fever, and shingles (6).

The poliomyelitis eradication program has made significant strides in reducing the incidence of paralytic disease. Furthermore, the global incidence of maternal and neonatal tetanus has been virtually eliminated, with the exception of 11 countries. Additionally, the efforts to eradicate measles have resulted in an estimated 57 million lives saved worldwide since 2000 (4).

Although vaccination practices in Türkiye began in the 1930s with the "Smallpox Vaccine", gained great momentum with the "Expanded Immunization Program (EPI)", launched in 1981. In our country, vaccination is voluntary. Within the scope of the EPI, which is organized and constantly updated with the recommendations of the 'Immunization Advisory Board' established within the Ministry of Health, both children who are citizens of the Republic of Türkiye and immigrant children living in our country are vaccinated against hepatitis B, tuberculosis, pneumococcus, diphtheria, pertussis, tetanus, H. influenzae type b, poliomyelitis, measles, rubella, mumps, chicken pox, and hepatitis A infections free of charge (7).

As a result of successful vaccination practices and vaccination campaigns, the last polio case in our country was seen on November 26, 1998. Türkiye received the "Poliomyelitis-Free Country Certificate" together with the WHO European Region on June 21, 2002. The lowest level of maternal and neonatal tetanus cases in Türkiye was documented by WHO in 2009. WHO reported that, as of the end of 2016, measles virus circulation in Türkiye had been interrupted for twelve months (3).

In the last decade, the vaccination rate for each vaccine in Türkiye has been above 95% (3). According to the Turkish Health Statistics 2022 annual report, the DTaP vaccination rate in our country has increased to 99.5%, the BCG vaccination rate to 98.1% and the hepatitis virus B (HBV) vaccination rate to 99.3%, while the measles, mumps, rubella (MMR) vaccination rate has been 95.2% and the conjugated pneumococcus booster vaccination rate has been 95.3% (8).

The COVID-19 pandemic process, and COVID-19 vaccinations have caused disruptions and setbacks in childhood vaccinations. The WHO 2030 vaccination targets include three pillars of the "Great Catch-up" initiative: making up for missed vaccinations in children, restoring immunization programs, and accelerating the strengthening of immunization programs (5).

Vaccine Hesitancy and Vaccine Refusal

One of the most important problems of our age is the decline in vaccination rates due to vaccine refusal (VR) and vaccine

hesitancy (VH). In fact, although VR and VH are as old as the history of vaccines, they have increased in our country and all over the world in recent years, and this is remarkable due to the emergence of vaccine-preventable infectious disease outbreaks and the danger of decreasing community immunity (1). This situation presents a significant risk, particularly for individuals in vulnerable groups (such as those with immune deficiencies or undergoing cancer treatment). The decision of families not to vaccinate their children poses a health threat not only to their own children but also to many different groups of people in society (9). Vaccine refusal refers to "the act of not vaccinating children due to a decision to decline all vaccines". Vaccine hesitancy was previously defined as the delay in accepting or refusing to receive vaccination services despite availability. This definition was recently changed in 2022 by the WHO Behavioral and Social Drivers of Vaccination (BeSD) Working Group and defined as " a motivational state of being conflicted about, or opposed to, getting vaccinated; this includes intentions and willingness" (10-11). Vaccine hesitancy is a phenomenon that manifests on a broad spectrum, encompassing individuals who accept all vaccines, and those who refuse all vaccines (12) .

Historically, during periods of high incidence of infectious disease, vaccine acceptance was high due to the high morbidity and mortality associated with these illnesses. However, following the implementation of effective control measures, including high vaccination rates, the necessity of vaccination and vaccine safety have increasingly been called into question. This has led to a decline in vaccination rates and, in some instances, to vaccine refusal (13).

The Strategic Advisory Group of Experts (SAGE), the WHO's main advisory board for vaccination, was established in 1999 by the WHO Director-General. With the 2011-2020 Global Vaccination Action Plan (GVAP), the SAGE aims to control VPDs worldwide and ensure that all individuals and societies live a life free from vaccine-preventable diseases. However, due to the increase in anti-vaccine movements worldwide, especially in the last decade, and the decrease in immunization rates, the 'Vaccine Hesitancy Working Group' was established within SAGE in 2012 (11,14). The "Vaccine Hesitancy Model" was created, and the factors that prevent vaccine acceptance were examined in three groups. In this model, determinants were revealed in three main areas: "contextual influences", "individual and group influences", and "vaccine and vaccination-specific issues" (15). The factors underlying vaccine hesitancy can be broadly categorized into the following: social media, vaccine lobbies, influential leaders, religious, cultural, geographical, social, political, and economic factors; perceptions about the pharmaceutical industry; the effects of the social environment; experiences regarding the vaccine; beliefs and attitudes about health; knowledge and awareness. The primary factors contributing to VH are the perceived risks associated with vaccination, social norms surrounding vaccination, trust in the healthcare system and healthcare workers (HCWs), the benefit/

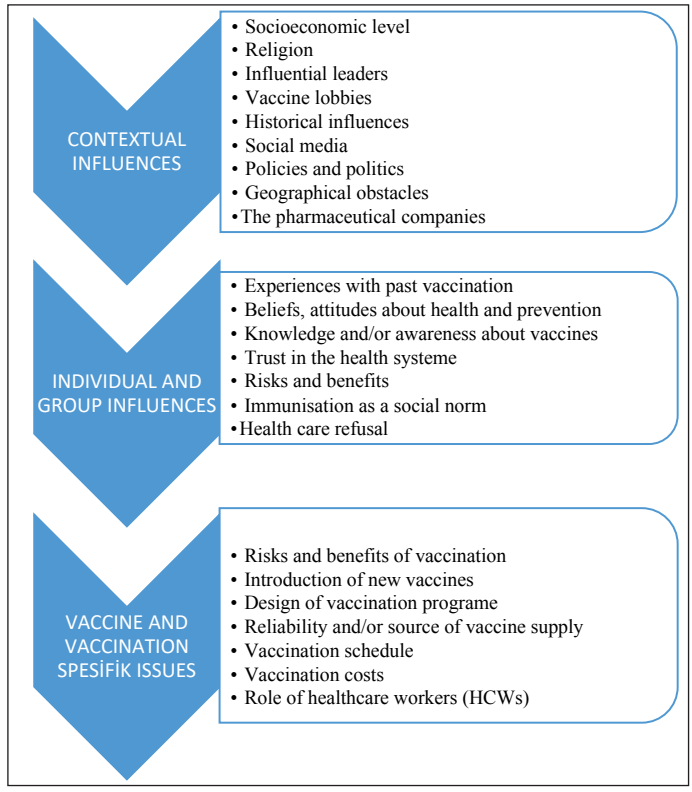

Figure 1: Vaccine Hesitancy Model modified from SAGE (15).

cost ratio of the vaccines, the implementation and management of the vaccination program, the attitudes of healthcare professionals, and the strength of their recommendations (12, 16-18). Vaccine Hesitancy Model modified from SAGE is given in Figure 1. The spectrum of vaccine hesitancy encompasses a range of attitudes, from complete acceptance to outright refusal of all vaccines and health care refusal. Vaccine Hesitancy Pyramid is given in Figure 2.

A review of the literature reveals that the most common reasons for vaccine hesitancy and refusal can be attributed to doubts about the effectiveness and reliability of vaccines, incomplete and incorrect information about vaccine-preventable diseases, religious reasons, fears about the side effects of vaccines, concerns about the content of vaccines, and distrust of the vaccine industry. The following factors have been identified as contributing to vaccine hesitancy and refusal: anti-vaccine information and documents on the internet and social media; difficulties in accessing the vaccine; HCWs not recommending the vaccines or not providing sufficient information about vaccines to parents; alternative medicine methods; trust in natural immunity; past negative vaccine experiences; and the influence of the social environment (19-21). In the international literature on vaccine hesitancy and vaccine refusal, it has been reported that these phenomena manifest at different educational levels and in all socioeconomic classes (19, 20, 22).

One of the most significant factors contributing to the reluctance to vaccination is the uncertainty surrounding the

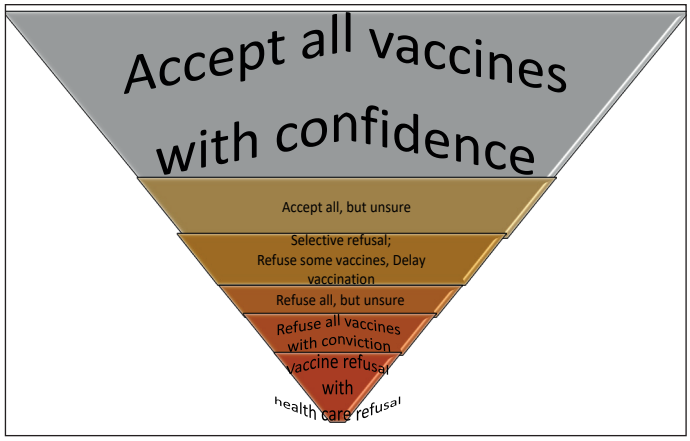

Figure 2: Vaccine Hesitancy pyramid

potential association between vaccines and autism spectrum disorder (ASD). A review of the scientific literature reveals that no study, from the past to the present, has identified a causal relationship between vaccines and autism (23). Another claim regarding the relationship between vaccines and autism is the 'thiomersal' content of vaccines. Scientific research has not found any relationship between thiomersal and autism (24). The assumption that aluminum, which is found as an adjuvant in vaccines, has a toxic effect is another reason why parents are hesitant about vaccination. The amount of aluminum found in vaccines is far below the acceptable level per dose, and no relationship has been found between aluminum-containing vaccines and autism (25). The claim that there is a relationship between vaccines and autoimmune diseases such as rheumatoid arthritis, immune thrombocytopenic purpura, systemic lupus erythematosus, Guillain-Barre syndrome (GBS), etc. is also quite common. There is no evidence that vaccines increase autoimmune diseases. On the contrary, there are many publications in the literature showing that vaccines do not increase the risk of autoimmunity (26).

Vaccine Hesitancy and Vaccine Refusal in Türkiye

The incidence of VR has increased in our country, particularly in recent years. The number of families who do not vaccinate their children has increased significantly. In 2011, there were 183 such families; by 2013, this figure had risen to 980, and by 2015, it had reached 5.400. By 2016, this number had increased further to 16.000. As of 2018, the number of cases of vaccine refusal had reached over twenty thousand (3). If vaccination rates continue to decline, epidemics are inevitable. In parallel with the increasing number of VR cases, the number of measles cases increased from nine in 2016 to 79 in 2017. It increased to 716 in 2018 and 2719 in 2019 (27). When the Turkey Demographic and Health Survey (TDHS) 2018 report is examined, it is seen that the rate of unvaccinated children between the ages of 12-23 months in our country is 2.2%, and it is 3.4% in children between the ages of 24-35 months (28). According to 2008 and 2013 TDHS data, the rate of unvaccinated children between the ages of 15-26 months is 1.6% and 2.9% (29, 30). However, not all of these cases are vaccine refusal. Vaccinations that were not performed due to contraindications or were postponed due to illness are also included in this number.

According to the 2018 TDHS report, the highest rate of unvaccinated children among the regions in Türkiye is in the Eastern Anatolia region, with 4.3% (28). This situation may be a result of a low education level, a low socioeconomic level, and a large family structure with many children. It is important to conduct further studies to determine the reasons by conducting regional analyses of vaccine refusal cases in Türkiye. The results of the study on the regional distribution of vaccine refusal cases in Türkiye are presented below: A total of 8.977 vaccine refusal (VR) cases were identified in 80 provinces in 2016, representing a VR rate of 3.5‰. This figure rose to 14.779 cases in 2017, with an associated VR rate of 5.9‰. The highest VR rates among children under the age of two were observed in the East Marmara region (8.4‰) in 2016, and in the West Anatolia region (10.9‰) and East Marmara region (10.9‰) in 2017 (31). In a different study investigating the sociodemographic and sociocultural characteristics of parents of children with zero dose between 12-35 months of age in Türkiye between 1993-2018, it was determined that the Eastern Anatolia region was significantly different from other regions. Low socioeconomic level, low education level, mother's language difference, inadequate antenatal care before birth were found to be associated with zero dose (32).

A danger after vaccine refusal cases: measles

It is established that measles, which is the most contagious and has the highest mortality rate among vaccine-preventable infectious diseases, was responsible for 2-3 million deaths per year during periods when vaccination was not widespread (33). In the absence of consistent vaccination practices, the number of unimmunized individuals in society will increase over time, leading to an increased risk of outbreaks. The reason for the low vaccination rates is poverty, war, etc. in underdeveloped countries, while in developed countries it is increasing vaccine hesitancy and vaccine refusal (3).

The incidence of measles decreased by 87%, and the mortality rate decreased by 84% between the years 2000 and 2016. The global vaccination rate for measles was 72% in 2000 and 85% between 2009 and 2016. These figures have prevented 20.4 million deaths worldwide (34). Since 2016, the global incidence of measles has increased, with a notable rise observed in each successive year compared to the preceding one. As reported by the World Health Organization in April 2020, the total number of measles cases in 2019 was 524,718, representing a 50% increase compared to the number of cases in 2018. The countries with the highest incidence of measles were Madagascar, Bangladesh, the Philippines, Nigeria, the Congo, Brazil, Kazakhstan, Ukraine, India, and Yemen (35).

The "Measles Elimination Program" was put into effect in Turkey in 2002. In our country, with the intensive immunization and control studies carried out since 2012, immunization rates have increased above the target level. However, in our country, where there is no problem accessing the vaccine, the increase in anti-vaccine ideas in recent years has caused a decrease in vaccination rates, and a significant increase in the number of measles cases has been observed (36).

The latest data from the WHO indicates that 56,634 cases of measles and four deaths were reported across 45 of the 53 countries in the WHO European Region during the first three months of 2024. Unfortunately, Türkiye is one of the top 10 countries in Europe with the highest number of measles cases and the highest incidence of measles (4698 measles cases and 54.74 incidence between April 2023–March 2024) (37). This is the consequence of the rise in the number of unvaccinated and inadequately vaccinated children in the population. In order to prevent outbreaks caused by vaccine-preventable diseases, the vaccination rate must be 90% or more, but for measles, which is very contagious, this rate must be 95% or more for both doses (33). According to the Turkey Demographic and Health Survey (TDHS) 2018 report in the study on Syrian immigrants, 84% of the children received the BCG vaccine and 77% received the first dose of oral polio. In repeated dose vaccines, it was observed that the vaccination rates gradually decreased (38). It is seen that the unvaccinated status of immigrants is high, and both Syrian and Ukrainian immigration has contributed to the increase in measles cases in our country.

Solutions for Vaccine Hesitancy and Vaccine Refusal

Studies examining the knowledge, attitudes, and behaviors of parents towards vaccines included in the childhood vaccination program provide clues about the perspectives and characteristics of anti-vaccine families. Parents' vaccine knowledge, perceptions, and vaccination behaviors vary (39). Vaccination concerns vary across societies, vaccines, and regions.

In fact, vaccines are extremely safe biological products, they are checked many times during the production and distribution stages. However, vaccine content and vaccine safety have always created hesitation in individuals. Vaccine refusal is an international problem with multifactorial and complex causes, requiring approaches and interventions at both individual and societal levels (9).

The phenomenon of vaccine hesitancy represents a significant challenge to public health, with an alarming increase observed in recent years. It is important to recognize that parents' decisions regarding vaccination can be influenced by a multitude of factors. In order to combat vaccine hesitancy and refusal, it is essential to determain the underlying reasons for these behaviors at the societal, national, regional, and local levels through rigorous scientific inquiry. This will facilitate the development of evidence-based strategies to enhance vaccination coverage and facilitate the formulation of effective solutions (9). It is incumbent upon scientists to fulfill a number of important duties in this regard. Physicians and all other health workers have a very important responsibility. Many studies have shown that trust in vaccines is related to trust in HCWs, and that families trust HCWs the most for information about vaccines (40). It is very important that HCWs must have sufficient knowledge about the necessity, benefits, and risks of vaccines and that sufficient time is devoted to health education. Families should be informed in detail about the contents of vaccines and their advers effects, and they should be provided with access to accurate information.

Today, the Internet is the world's largest source of health-related information, and unfortunately, it provides space for vaccine hesidants to influence others. Fears about the safety and effectiveness of vaccines, alternative medical approaches to health, parental autonomy over vaccination, claims that it is a personal right not to vaccinate, and conspiracy theories about connections between doctors, the government, and pharmaceutical companies are among the most common statements on anti-vaccine websites. The number of people sharing anti-vaccine content on social media platforms such as Facebook, Instagram, and X platform is rapidly increasing. This may cause parents who are hesitant about vaccination and encounter such content instead of accurate information to make wrong decisions (41). Disinformation about vaccination on media platforms, including social media, should be prevented, and society should be made aware of scientific facts about vaccines and vaccination.

While coercive and punitive approaches to vaccination may be effective in the short term, they have been shown to damage trust in official institutions in the long term. It has been suggested that incentives may be a more effective method than punishments. Studies have indicated that families who receive financial, health, and educational support from the state are more likely to have their children fully vaccinated during childhood (18).

Transparency in vaccination records, sharing information about adverse effects after vaccination, etc., with the public increases trust. Sharing the results of all kinds of scientific studies on vaccines in a language that the public can understand, through the media or social media, will contribute to informing and raising awareness in society about vaccines (9). It is evident that civil society organizations, unions, and associations that have a say in the formation of health policies also have an important role to play in combating vaccine hesitancy (18).

In the study conducted by Çelik et al. (42) with 23 vaccine refusing mothers of different socioeconomic levels in Ankara, the center of Anatolia, it was observed that the most important factor underlying vaccine refusal was not related to trust. It was emphasized that in cases of vaccine refusal, it would be rewarding to try to respond to mothers' expectations and their

need to be understood with patience, up-to-date information and non-accusatory communication. It was emphasized that in cases of vaccine refusal, it would be rewarding to try to respond to mothers' expectations and their need to be understood with patience, up-to-date information and non-accusatory communication. It is necessary to develop communication tools that better address and emphasize the achievements of modern medicine in the fight against vaccine refusal (42).

Scientific facts about the necessity of vaccination should be conveyed to the society in an understandable way. The fact that the benefit/harm balance is in favor of vaccination when the adverse effects of the vaccine are compared to the effects of the disease should be emphasized. "Healthy life" is the right of every child. Child health monitoring and vaccination practices should always be continued without interruption. In the fight against hesitancy regarding vaccines, it is essential for each society to determine its own risk factors and develop strategies for solutions.

Policies regarding childhood vaccines around the world

When the policies implemented in the world regarding childhood vaccinations are examined, it is evident that there are different practices. There are programs where certain vaccines are mandatory in some countries, some vaccines are mandatory in pre-school, or all childhood vaccinations are recommended. The most prevalent practice globally is the mandatory administration of vaccinations prior to admission to educational institutions (43).

The country with the highest number of mandatory vaccinations in the world is in the European region, however, vaccination practices in the European region are quite heterogeneous by country. France, Italy, Slovenia, Serbia, and Moldova are among the European countries with mandatory vaccinations. The United Kingdom, the Netherlands, Norway, Finland, Denmark, and Sweden do not implement mandatory vaccinations, but offer them as recommendations. In Slovenia, those who do not vaccinate without a medical exemption are subject to a fine (43, 44). In 2016, Australia introduced a policy that allows children and their families to have their children fully vaccinated to benefit from tax benefits (45). Mandatory vaccination for school entry is common in some states of America. Data from Africa is limited, and it is known that mandatory vaccination is prevalent; Kenya and Uganda are two countries where vaccination is mandatory. There are also different practices in the Southeast Asian region; While India recommends vaccination, Indonesia has mandatory vaccination, especially for measles (43). The diversity of vaccination practices observed across countries worldwide is evident. In Türkiye, vaccination is not mandatory; it is instead based on a voluntary basis. There are no legal sanctions for parents who do not vaccinate their children.

When legal sanctions regarding vaccine hesitancy in the world are examined, vaccination is mandatory in many states in the United States before starting university, and around 1% of students nationwide are exempted from vaccination due to religious or other beliefs. In Australia, while vaccination is not a compulsory procedure, families who choose to vaccinate their children are provided with financial support. In Latvia and Slovenia, vaccination is mandatory, whereas in Slovenia, families who do not vaccinate their children are liable to financial penalties. In Lithuania, Poland, the Czech Republic, Slovakia, Hungary, Slovenia, Romania, and Bulgaria, the legal requirement for measles vaccination has been established. In 11 European countries, the administration of the polio vaccine is mandatory, as is the administration of the diphtheria and tetanus vaccines in 10 European countries. Similarly, in nine European countries, the hepatitis B vaccine is also required. It is more common for countries to have partial compulsory vaccination policies (46, 47).

Tools and Measures Investigating Vaccine Hesitancy and Vaccine Acceptance

Following the definition of VH and the identification of its components, the concept of developing measurement tools to assess VH has emerged. Identifying the underlying causes of vaccine hesitancy and vaccine refusal will also help develop global solutions to increase childhood vaccination rates, so universal scales to measure vaccine acceptance and vaccine hesitancy have begun to be developed. Validated measures of childhood vaccine confidence are needed that provide comparable data over time and can be used across different populations.

There are various scales in the literature that assess parental vaccine hesitancy. A review compared the characteristics of 14 vaccine strains developed between 2010 and 2019 and found that the vast majority of these scales were developed in high-income countries (48). The most commonly used instrument is the Parental Attitude Scale (PACV) on Childhood Vaccinations, developed by Opel et al. in 2011. A high score on this scale is indicative of an opposition to vaccination (49). Another scale developed on the conceptual basis of the health belief model is the 'Vaccine Confidence Scale' by Gilkey et al. (50). Larson et al. (51) aimed to assess parents with vaccine hesitancy with the 'Vaccine Hesitancy Scale', Wallace et al. (52) aimed to determine parents' attitudes towards vaccines with the 'Vaccine Attitude Scale', and Sarathchandra et al. (53) aimed to assess parental vaccine acceptance with the 'Vaccine Acceptance Instrument'. The aim of the 'Childhood Immunization Survey', developed by the WHO BeSD working group, is to measure caregivers' experiences of vaccination, their perspectives on vaccination, and their confidence in vaccination. To measure the experiences and perspectives of the affected caregivers (48). Some of these scales have been validated and reliable in Turkish to assess vaccine acceptance and vaccine hesitancy in Türkiye (54-56). Studies continue to be conducted with scales that have proven to be valid and reliable in Turkish with different parent and patient groups in our country.

The Combination Of Health Care Refusal And Vaccine Refusal

Parents sometimes refuse other treatments, just as they refuse vaccines, for reasons such as side effects that may arise from injections, a desire to be natural, and a belief in alternative methods. One of these problems is the refusal of vitamin K prophylaxis. Recently, parents have also refused vitamin K application because they think it is a vaccine. Despite the absence of epidemiological data on the prevalence of neonatal haemorrhagic disease in our country, numerous cases diagnosed with neonatal haemorrhagic disease due to vitamin K deficiency have been documented (57,58).

One of the important practices within preventive health services is screening programs. In Türkiye, there are screenings starting from the newborn period (phenylketonuria, congenital hypothyroidism, biotinidase deficiency, cystic fibrosis, congenital adrenal hyperplasia, spinal muscular trophy with heel blood sampling, and hearing screening, developmental hip dysplasia, eye examination, anemia screening, etc.) (59). Unfortunately, due to heel blood sampling refusal, babies lose their chance of early diagnosis through screening. The decrease in hospital births, heel blood sampling refusal, vitamin K refusal, neonatal and maternal deaths will increase. The necessary legal measures must be taken as soon as possible. Healthcare professionals must continue to relentlessly explain the importance of vaccinations and screenings to hesitant parents.

CONCLUSION

Vaccine hesitancy, which has reached serious levels in our country as well as in the world, leads to a significant increase in morbidity and mortality related to vaccine-preventable diseases, especially measles. Sociodemographic and sociocultural factors, concerns about vaccine content and vaccine side effects, and a lack of knowledge about the necessity of vaccination are the main reasons underlying vaccine hesitancy and vaccine refusal. The most important task in combating vaccine hesitancy is that of healthcare professionals. Correct communication between physicians and patients increases trust in vaccines, and therefore, vaccine acceptance. Accurate and sufficient information about vaccines, questioning the underlying reasons in cases of vaccine hesitancy or vaccine refusal, providing the necessary information in an explanatory and understandable manner, and continuing healthcare services uninterruptedly are essential under all circumstances. Bringing the need for vaccination to the agenda at every meeting will have a positive effect on the decision-making process of hesitant families. Removing false information and content about vaccines on social media can also have a positive effect on parental decisions. It should never be forgotten that every child has the right to be vaccinated and live a healthy life.

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