

# GEORGIAN MEDICAL NEWS

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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии  
საქართველოს სამედიცინო სიახლენი

## GEORGIAN MEDICAL NEWS

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

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

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

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

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

### WEBSITE

[www.geomednews.com](http://www.geomednews.com)

## К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

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

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

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

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

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

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

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

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

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

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

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

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

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

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

**При нарушении указанных правил статьи не рассматриваются.**

## REQUIREMENTS

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

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

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

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

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

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

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

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

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

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

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: [http://www.nlm.nih.gov/bsd/uniform\\_requirements.html](http://www.nlm.nih.gov/bsd/uniform_requirements.html)  
[http://www.icmje.org/urm\\_full.pdf](http://www.icmje.org/urm_full.pdf)

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

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

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

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

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

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

## ავტორთა საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ შემდეგი წესები:

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

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

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

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

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

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

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

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

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

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

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

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

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## THE PHYSICAL AND PSYCHOLOGICAL EFFECTS OF MOBILE GAMES ON CHILDREN IN MOSUL/IRAQ

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### Abstract.

Electronic devices have become part of our daily activities and work schedules. Increasing their use by children might have positive and/or negative health issues. The present study aimed to identify the risk and/or benefit of increasing smart devices use by children. To do so, an online survey was designed using Google forms. The electronic form was distributed electronically, and responses were collected and analysed. The outcome responses to the question were either YES or NO. The result was represented as a YES and the rest of the percentage was obviously NO. The sample collected was subclassified as toddlers, preschoolers, school-aged children, and adolescents based on the age-scale chart. Results confirmed that electronic devices are not too worse as they were thought. Parents have confirmed that their children have hobbies, and they have their friendship. Parents confirmed that the pathological impacts of using electronic gadgets were weak. Parents have confirmed that electronic devices have improved their children's thinking skills and intellectual activities. A relatively small percentage reported that electronic devices have a negative impact on child social and psychological aspects. A vast majority of parents especially in the adolescent age group have reported a positive impact of electronic devices on child behaviour and problem-solving. To sum up, our study concluded that electronic devices might improve intellectual skills and overall physical and thinking behaviors with reportedly adolescent intellectual activities affected.

**Key words.** Electronic devices, games, videos, psychology, mobile, mood.

### Introduction.

The use of electronic devices has increasingly grown all over the world and children are greatly involved. Numerous studies have shown that children and adolescents spend the majority of their time using devices including the phone, TV, games, Xbox, iPod, and audio system [1]. Children utilize technology for a variety of activities, including playing games, viewing movies, listening to music, communicating with friends, and visiting other websites [2]. They spend the majority of their time doing these things without giving any thought to their posture, screen brightness, or screen distances from their eyes, all of which have an impact on their vision and general health [3].

A contemporary worry is how the internet and smart devices have become part of our daily lives. It is obvious that this growth will have an impact on children's daily lives. In combination with children's networks and interactive television [4]. The speed and type of smartphone with the availability of the internet and touchscreen devices have encouraged children to use these electronic devices more and more [5]. The present study aimed

to investigate the children behavioral and psychological changes following long-term use of electronic devices based on parents' ideas and information collected and analysed.

### Subjects and Methods.

To collect the data, an electronic Google form survey was designed. The electronic form was distributed among parents electronically through websites, friends, institutions, and in person. The form contains questions subdivided into sections starting with parents and children's demographic factors. The sections also include questions regarding rules imposed by parents about using electronic devices. Then, the next sections include the effects of electronic devices on friendship relationships and children's hobbies, the pathological impacts of using electronic gadgets, the negative impact of electronic devices on child social and psychological aspects, and the positive impact of electronic devices on child behaviour and intelligence aspects.

The total collected responses were 513, the responses include parents who are talking about their children at different ages starting from 1 year and up to 15 years. Therefore, these respondents have been classified by age scale (Table 1) into toddlers, preschoolers, school-aged children, and adolescents.

Data were collected and parametric data were expressed as mean±SD. The non-parametric data were mostly answers of parents to the questionnaire by "YES" or "NO" which were represented as several responses with "YES" and hence their percentage and ultimately the rest means they are "NO". These non-parametric data were compared to each other, and significance was determined through Kruskal-wellies and Chi-square test using GraphPad Prism (Version 14, USA).

**Table 1.** Children age-scale and distribution of participants groups in the present study.

Scale	Ages	Participants groups
Newborn	0–4 weeks	0
Infant	1 month–1 year	0
Toddlers	1–2 years	3
Pre-schoolers	2–6 years	58
School-aged child	6–12 years	224
Adolescent	12–18 years	228
Total		513

### Results.

The demographic characteristics of parents are represented in Table 2. Most of the parents were in the middle age groups of around 40 years (mother 39.5±6.8 and father 45.4±7.7). Almost all parents (>80%) were university graduates with high



educational levels. Nearly one-half of parents were employed in the governmental sector and one-half are working in the private sector. The mean of children number  $2.46 \pm 1.4$  (ranging, from 1-6).

**Table 2.** Parent's demographic parameters.

Parameters (n=513)	Mother (n=513)		Father (n=513)
Age (years)(Mean±SD)	39.5±6.8		45.4±7.7
Educational level n (%)	Primary School	43	13
	Secondary School	60	50
	University Graduate	410	450
Employment status* n (%)	Employed	292	350
	Not employed	221	163
No. of children in the family man (Range)	2.46±1.4 (1-6)		
Employed=Governmental sector, Not Employed= private sector			

The demographic characteristics of the children sample involved in the study were outlined in Table 3.

**Table 3.** Child's demographic parameters (average).

	Toddlers (n=3)	Pre-schoolers (n=58)	School-aged child (n=224)	Adolescent (n=228)
Age (mean±SD)	2.3±1.5	5±1	10±	14±1.24
Sex: boys	100%	58%	59%	59%
Weight (Kg) mean±SD	18±1	20.5±6.7	36.3±12.2	52.1±11.5
Height (cm) mean±SD	116±29.5	100±28	134±21.4	156±15
Birth order*	3.3	2.3	2.45	2.8
*We took the average order of intended child among his brothers.				

The age of starting to work on electronic devices started very early at around 2 years in toddlers, 3 years in preschoolers, 6 years in school-aged children, and 8 years of adolescence. The mean time spent on electronic devices was around 2 hours in toddlers, 3 hours in preschoolers, and around 4 and 5 years spent on electronic devices by school-aged children and adolescents. Parents have also mentioned that one-half of children have their own devices. Nearly two-thirds of parents confirmed that rules were applied for using devices and specific times were applied and certain games were imposed not to be played by their children (Table 4).

Asking parents about their children's relationships to a friend and habits revealed that the vast majority of their children were having friends reaching up to 90% with at least children in preschool age having at least 2 friends reaching to 4 friends in school-age and adolescent age. One-half of children reportedly have certain hobbies (Table 5).

Weight has been reported to be increased in three-quarters of preschoolers, school-aged, and adolescents. Only a few cases (around 10%) were reported to wear glasses and most were already wearing eyeglasses they reported that devices have only weakly affected their eye tone since a year before. However,

pain in the eye, head, and back or muscles was associated with a quarter of children. One-half suffer from memory decrease. One-third suffer from fatigue and anorexia in the daytime. Toddlers are weakly affected by these pathological impacts (Table 6).

**Table 4.** Parents' rules for use of electronic devices.

Rules	Toddlers (n=3)	Pre-schoolers (n=58)	School-aged child (n=224)	Adolescent (n=228)
At what age did the child start playing electronic games	2.3±1.5	3±1.7	6±2.3	8.26±3*
How many hours does a child spend with a mobile phone in a day?	2.66±1.5	2.97±2.2	3.86±2.6#	4.73±3.4*
Does the child has his e-device	0(0%)	24(42%)	118(53%)	116(51%)
Are there rules at home for using the Internet for children?	3(100%)	38(66%)	146(65%)	150(66%)
Is a specific time imposed for playing electronic games?	2(67%)	38(66%)	146(65%)	150(65%)
Are certain games imposed that can or cannot be played?	1(33%)	41(70%)	154(69%)	157(69%)
**p<0.05 using series of t-test.				
*As compared to all other groups.				
# as compared to toddlers and pre-schoolers				

**Table 5.** Friendship relationships and children's hobbies.

Parameters	Toddlers (n=3)	Pre-schoolers (n=58)	School-aged child (n=224)	Adolescent (n=228)
Does your child have any hobbies?	1(33%)	32(55%)	132(59%)	136(60%)
Does your child have friends?	2(67%)	50(86%)	203(91%)	207(91%)
How many friends does your child have? *	1	2.21	3.93	4.2
*We took the average number of friends				

Parents have been asked about the social and psychological behaviour of their children. Nearly one-third reported that their children have weaknesses in social relationships. Nearly one-half have poor concentration. Additionally, one-third of children were reported to be scared or afraid after fighting games. More than one-third have reported aggressive behaviour fighting with their friends. Only a small percentage reported that their children suffered from depression. Regarding the impact of electronic devices on sleeping a quarter of preschoolers and school-aged children and one-half of adolescents were reported to struggle with sleeping, nevertheless, most often the children were late to fall asleep. A quarter has also reported that their children suffer from psychological problems. One-third reported that their children used bad words during or after games. Nearly one-half reported that their children spoke slang language with borrowed words from games. Nearly one-half of toddlers and

preschoolers alongside one-third of school-aged adolescent has reported that their children use some of the martial arts that he practices in the game with their brothers and friends (Table 7).

Despite the negative aforementioned parameters reported by the parents in the present study, we also asked the parents some important questions to investigate the positive aspects of using electronic devices. One-third of parents do think that electronic games have benefits whether toddlers, preschoolers, school-aged or adolescents. Similarly, one-third of parents do think that electronic games increase the intelligence of the child. Moreover, one-half of parents of school-aged adolescents think that electronic games increase the ability to solve problems at a lower rate in preschoolers and toddlers, these parents at the same percentage do agree to apply electronic games for the treatment of diseases such as autism. Two-thirds of parents in any category responded positively that electronic games increase the ability to learn English. One-half of parents in any category responded positively that electronic games increase the ability to think quickly and make decisions quickly. One-half of parents in any category responded positively that electronic

games increase the ability to read and solve math questions. One-half of parents in any category responded positively that electronic games increase their children's ability to recognize visual objects faster (Table 8).

Overall outcomes of different groups showing that adolescents are most groups negatively affected and toddlers are the lowest (Table 9).

### Discussion.

Parents claimed that their children are using devices at a specific time and there seem to have specific rules. The specification of time and application of rules for using electronic devices might be properly associated with positive impacts. In a study conducted by McNeill et al. [6], confirmed that the cognitive and psychosocial maturation of preschool-aged children may be influenced by the use of electronic applications for no more than 30 minutes per day and minimal media consumption. Yu and Park [7] confirmed that use of the internet for communication, idea sharing, and socializing. a chance to interact with people and meet new acquaintances. Moreover, the use of electronic

**Table 6.** Pathological impacts of using electronic gadgets.

Parameters	Toddlers (n=3)	Pre-schoolers (n=58)	School-aged child(n=224)	Adolescent (n=228)
Has the child's weight increased or decreased compared to last year?	1(33%)	40(69%)	183(82%)	187 (82%)
Does the child wear glasses	0(0%)	1(2%)	20(9%)	20(9%)
Does the child already on eyeglasses before e-device	0(0%)	1(2%)	35(16%)	59(26%)
Has your baby's eye tone been affected since last year?	0(0%)	10(17%)	48(22%)	48(21%)
Does he get pain in the eye?	1(33%)	18(31%)	57(26%)	61(26%)
Does he get pain in the head after playing	0(0%)	11(19%)	57(25%)	55(24%)
Does he get back or muscle pain?	0(0%)	10(17%)	53(24%)	52(22%)
Does his memory decrease or are his studies affected during the period of electronic play?	1(33%)	27(47%)	121(54%)	123(54%)
Does he suffer from fatigue in the daytime	0(0%)	15(26%)	71(35%)	80(35%)
Does he suffer from anorexia	1(33%)	28(48%)	82(37%)	86(38%)

**Table 7.** The negative impact of electronic devices on child social and psychological aspects.

Parameters	Toddlers (n=3)	Pre-schoolers (n=58)	School-aged child(n=224)	Adolescent (n=228)
Do you feel that he has a weakness in social relations with family and friends?	0(0%)	20(34%)	65(28.6%)	66(29%)
Do you feel that he has poor concentration?	1(33%)	25(43%)	101(45%)	100(44%)
Does he feel scared after fighting games or is he afraid?	2(67%)	24(41%)	76(34%)	80(35%)
Is he fighting with his friends for the game?	3(100%)	35(60%)	103(46%)	107(47%)
Does he suffer from depression?	0(0%)	9(16%)	31(14%)	32(14%)
Does he have trouble sleeping?	0(0%)	15(25%)	52(24%)	131(57%)
Is he late to sleep?	2(67%)	31(53%)	123(55%)	125(55%)
Does he suffer from psychological pressure?	1(33%)	12(22%)	51(23%)	50(22%)
Does he suffer from using bad words more during or after playing	1(33%)	21(36%)	81(%36)	80(%35)
Has your child's speaking slang been affected by the games he plays?	2(67%)	33(57%)	94(42%)	95(42%)
Does your child practice the martial arts that he practices in the game with his brothers and friends?	2(67%)	27(47%)	81(36%)	84(37%)

**Table 8.** The positive impact of electronic devices on child behaviour and intelligent aspects.

Positive parameters	Toddlers (n=3)	Pre-schoolers (n=58)	School-aged child(n=224)	Adolescent (n=228)
Do you think that electronic games have a benefit?	1(33.3%)	14(24.1%)	76(34.1%)	77(33.9%)
Do electronic games increase the intelligence of the child	2(66.6%)	15(25.8%)	93(41.5%)	94(41.3%)
Do electronic games increase the ability to solve problems	1(33.3%)	13(22.4%)	52(23.2%)	52(22.7%)
Can electronic games be useful for diseases such as autism?	2(66.6%)	9(15.5%)	43(19.1%)	44(19.5%)
Do electronic games increase the ability to learn English	2(66.6%)	41(70.6%)	177(79%)	180(79%)
Do electronic games increase the ability to think quickly and make decisions quickly	2(66.6%)	25(43.1%)	124(55.3%)	125(54.8%)
Do electronic games increase the ability to read and solve math questions	3(100%)	18(31%)	100(44.6%)	103(45.1%)
Do electronic games increase the ability to recognize visual objects faster?	2(66.6%)	37(63.7%)	149(66.5%)	150(66%)

**Table 9.** The most affected group according to measured parameters.

Parameters	Toddlers (n=3)	Pre-schoolers (n=58)	School-aged child(n=224)	Adolescent (n=228)
Friendship relationships and children's hobbies.	^	*	*	*
Pathological impacts of using electronic gadgets	^	*	*	*
The negative impact of electronic devices on child social and psychological aspects.	^	*	*	#
The positive impact of electronic devices on child behaviour and intelligent aspects.	^	*	*	*

\*Equally affected, # affected more than other groups, ^ weakly affected or not affected compared to other groups

devices should be restricted to a specific time and duration to avoid difficulties in time management [8]. Reports confirmed that parents face difficulties in applying rules to use electronic devices, especially in adolescents [9]. In a previous analysis, the overall amount of time spent on mobile devices was substantially linked to poor sleep patterns, reductions in study habits, increases in class absences, and spikes in tardiness for courses [10].

Parents stated that the friendship and social behaviors of their children are not affected. Social networking is a current internet usage that is very common [11], social confidence and overall well-being [12]. Although social network addiction is linked to more challenging emotion regulation [13]. Research has shown that those who regularly multitask while using media (mainly the internet) score worse on cognitive control tests, have more socioemotional issues, and have less grey matter in the parts of the brain that manage attention [14].

The parents have reported a weak link between the use of electronic devices by their children and pathological abnormalities including, pain in the eye, use of eyeglasses, reduced eyesight, decreased memory or fatigue in the daytime. Computer vision syndrome, which presents as eye strain, dryness, irritation, burning feeling, redness, blurred vision, and double vision, is brought on by prolonged usage of electronic devices [15,16]. Users of mobile devices frequently experience problems of the arm, neck, and shoulder, which are described as "musculoskeletal complaints of the arm, neck, and/or shoulder not caused by acute trauma or by any systemic disease." The

major cause of the pain is incorrect computer handling technique or posture. Using computer and desk settings that are not ergonomically sound is one of the most frequent causes [17]. Long-term computer users should practice good posture, employ ergonomically designed furniture, switch to ergonomically friendly novel gadget designs, and engage in stretching exercises to alleviate stress and discomfort without compromising productivity. Additionally, students must take breaks whenever they can. The amount of time spent on computers and general musculoskeletal diseases are significantly correlated [18].

The negative impacts associated with using electronic devices have been reported in this study in the form of weakness in social behaviour, reduced concentration, psychological deficit, sleeping trouble, depression, and violent behaviours. All of these negative points were reported by parents, however, the percentage reported in all these negative impacts is either lower than 50% or slightly higher. These confirm that these negative impacts are weakly associated with using electronic devices. In the line with our findings, more frequent smartphone use is linked to a cognitive style that is less analytical and to cognitive decline [19]. Smartphone addiction is on the rise, and it is linked to higher levels of stress and lower academic achievement [20]. Using electronic devices has been reported to affect children's scores in schools [21,22], comprehension ability [23], executive functions [24], reduced mood and attention [25], and blocking recalling of information [26].

The present study focused on some positive aspects of using electronic devices on children's intellectual ability including

their ability to think better or solve problems in mathematics or improve their English language skills. The outcome has supported that the children's intellectual and thinking ability has improved especially in school age and adolescent age with a lower percentage in toddlers and preschool children. On the other hand, a significant number of research have focused on internet use in general, the subject of the current study, or general internet addiction (addictive internet use). Internet use has general and content-specific consequences, much like watching television [27]. In a sizable sample, it has been demonstrated that heavy internet use is linked to poorer academic performance [28].

### Conclusion.

Electronic devices are bi-armed tools carrying both negative and positive aspects. Prohibition of children from using electronic devices could have impact on children on another aspects. Therefore, proper use of electronic devices according to established rules by the parent with monitoring of their behaviour could solve this issue. Most children involved in the present study were reported to be out of the danger zone from using electronic devices.

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