

The Use of Technology and Daily Living Activities of School Age Children: An Assessment Study

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Abstract: Background: School age children spend many hours a day using technology and the vast majority of them have access to internet, cell phones, computer, video games and many other forms of technology. The current study **aimed** to assess the use of technology and daily living activities of school age children. **Design:** A descriptive research design.

Setting: This study was conducted at (3) primary schools in El Masara district in Helwan city. **Tools:** Two tools were used for data collection; the first tool was structured interviewing questionnaire sheet, the second tool was an adapted questionnaire that was developed by Dehmler (2009). **The results** of the present study revealed that the majority of the studied children had a computer at home, more than half of them had a computer in their bedroom and the majority had their cell phones. More than one-fifth of the studied children were highly total technology users while more than one-third of them were moderately total technology users. There was a statistical significant correlation between school age children's technology use and their daily living activities.

Conclusion: Based on the findings of the present study, it was concluded that school age children with moderate to high use of total technology were had a moderate effect on their daily living activities.

Recommendations: Health education of the school age children on the appropriate use of technology and its effect on children's daily living activities.

Keywords: Technology use, Daily living activities, School age children, Pediatric, Nursing.

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I. Introduction

The school age is a time of continued maturation of the child's physical, social, and psychological characteristics. As well as, school children are experiencing a time of slow progressive physical growth, while social and developmental growth accelerates and increases in complexity. School age children have ardent thirst for knowledge and accomplishment, school age children focus on the world expand from family to teachers, peers, and other outside influences (e.g., coaches and media). ^[1]

Technology has been growing rapidly in the last two decades across the world. Technology is the use of science in industry and engineering to invent useful things or to solve problems. ^[2] Children are growing up with more exposure to technology. Technology can range from watching television, using the computer, to swiping devices in the palms of the hands. ^[3]

Technology is an integral part of children's lives in the twenty-first century. In Egypt, there are 64.95 million mobile phone users; 49.23 million having internet access, As well as, Egypt's internet users spend about 3 hours and 19 minutes on average viewing television (TV), video games and playing online games. Also spend about an hour and 11 minutes on average streaming music every day. According to Face book's records, there are 39 million Egyptians registered on Face book and 10 million active Instagram users. ^[4]

School age children use the internet, cell phones, television, computer and video games daily. Children use technology in different formats for school, communication, social media and entertainment. Technology is being used to help develop attention skills and to teach children how to focus, improve memory, learn a language, broaden creativity and strengthen problem-solving abilities. However, there are still some consequences to technology and gaming. One consequence of technology and the internet is that children may become very skilled in finding resources and information, but less skilled in memorizing information. Another consequence is that technology distracts children away from daily living activities. ^[5]

The school age children spend more time mainly using the internet and computer. A part of that time serves a useful purpose like preparing homework, obtaining information and searching. Additionally children spend most of the time playing games, chatting, texting and downloading films, games, music and programs. Excessive and uncontrolled use may cause many physical, psychological, social and academic problems. ^[6]

Children ages 8 to 18 years, in the United States (U.S) spend about 4 hours a day either watching TV or playing video games and another 2 hours on computer outside of school work. ^[7] Egypt has ranked as the highest in using smartphones among school age children. In addition to that the uses of social networks on mobile phones were more common among children who use smartphones, where 85% use social networks from their smartphones in Egypt. ^[8]

Activities of daily living (ADLs) encompass some of the children of the most important occupation learn as they mature. Self-care or ADLs include learning how to take care of one's body, such as toilet hygiene, bowel and bladder management, bathing and showering, personal hygiene and grooming, eating and feeding, dressing and functional mobility. ^[9]

Electronic devices viewing frequently limit children's time for vital activities such as playing, reading, learning to talk, spending time with peers and family, storytelling, participating in regular exercise and developing other necessary physical, mental and social skills. Because electronic devices take time away from play and exercise activities, children who watch a lot of electronic devices are less physically fit and more likely to eat high fat and high energy snack foods. ^[10]

A pediatric nurse can provide information about the benefits and health risks of technology use with school age children and their parents in ways that can optimize opportunities for school age children's cognitive, social, emotional, physical and linguistic development. ^[11]

1.1 Significance of the Study

School age children are an important population to reach, because school age children are heavy technology users and are likely to be getting a first cell phone and the first computer at home and are increasingly using the internet at school and for schoolwork. School children are exploring more online, joining social networks and starting to take more risks online. Developmentally, School age children are starting to pull away from parents and become more independent. ^[12] So, it's very important to carry out this study to shed light on technology use and its effect on the daily living activities of the school age children.

1.2 Aim of the study

The current study aimed to assess the use of technology and daily living activities of school age children.

1.3 Research Questions:

The present study intended to answer the following questions:

1. What is the pattern of technology use by the school age children?
2. Is there a relation between technology use and daily living activities of the school age children?

II. Subjects And Methods

2.1 Research design:

A descriptive research design was used to conduct the present study.

2.2 Research setting:

The study was conducted at primary schools in El-Masara district in Helwan city. The total number of schools were (15) school. Three schools were selected by systematic random sample, namely; Anas Ebn Malek, Omar Ebn El Hkatab and 25 official January. Then by simple random sample one class was chosen from both the fifth and sixth grades from each school.

2.3 Subjects:

A Purposive sample of 280 students was selected from the previously mentioned setting where data were gathered over a six months period.

Inclusion criteria were involved in the study:

- 1- Both gender.
- 2- School age children (10-12 years).
- 3- School age children with technology access.

2.4 Tools of data collection:

Two tools were used to collect data as the following:

Tool (I): A Structured Interviewing Questionnaire Sheet

A structured interviewing questionnaire sheet that was designed by the researcher, after reviewing the current available literature and was written in simple Arabic language (to suit the level of understanding of school age children) and involves the following parts:

Part I:

A) Characteristics of the school age children: such as age, gender, educational stage, birth order, number of siblings and name of school.

B) Characteristics of the parents: such as age, level of education, occupation and family income.

Part II: This part was concerned with the daily living activities of the school age children as the following:

Physical daily living activities included numerous meals, bathing, personal hygiene, grooming, sleep, making sports activity, blurred vision, hearing impairment, neck pain, back pain, headache, weight, backbend and feeling tired.

Social daily living activities included time spent with family, social awareness, play with friends, visit relatives, participation with others, laziness, social tension and active role with family.

Psychological daily living activities included sleeping problems, depression, isolation, anxiety, aggression, or violence and escape from responsibility.

Scholastic daily living activities included concentration, memorization, learning, writing, reading, school achievement, committee with the school day and escape from school.

Scoring System of daily living activities:

The total daily living activities score was calculated based on student's responses to items (each item has one score). The responses were ranged from 1- 3 for every item (never =3, sometimes =2 and always =1). The scores of items were summed –up and the observed score divided by the maximum score of the items, giving a mean score for the item and classified into low effect (<50%), moderate effect (50-75%) and high effect (>75%).

Tool (2): The questionnaire that was developed by **Dehmler (2009)** ^[13] was adapted by the researcher, It contains 16 items regarding the overall technology use. The first eight items used to measure the school age children's daily use of the internet, cell phones and computer games (general technology usage). Then, nocturnal technology use items that were inquired about the children's technology use after 10.00 Pm (9-16).

Scoring system of technology use pattern:

The scoring system with rating different grades for each question, increasing the technology use increased the score, the score of general technology use questions ranged from 8-33 grades, nocturnal technology use questions ranged from 8-39 grades and total technology use questions ranged from 16-72 grades.

Score % = the observed score / the maximum score × 100. It was categorized into three patterns: Low technology use (<50%), moderate technology use (50-75%) and high technology use (>75%).

2.5 Pilot Study:

It was conducted on 10% (30 students) of the studied children. The pilot study aimed to test the clarity, applicability and efficiency of the tools and then the necessary modifications of the tools were done according to the results of the pilot study. The pilot study had also served to estimate the time needed for each subject to fill in the study tools. Children involved in the pilot study were excluded from the main study sample later.

2.6 Field Work:

The actual fieldwork started at the beginning of December 2017 and was completed by the end of April 2018. Data collection was done by the researcher during school day. The actual work started by meeting the school manager throughout the morning school day. The researcher first introduced herself to them and gave them a complete background about the study and sheet format which was predesigned by the researcher in an Arabic language to collect the required data. Then the researcher went to students' classrooms to introduce herself to them and explained aim of study, get their verbal approval for data collection. The interviewing questionnaire sheets were completed by the researcher from each student in their class at the school. The time needed by students to complete the questionnaire was ranged between 15-20 minutes. The researcher visited each school twice per week to collect data.

2.7 Ethical considerations:

Prior study conduction, ethical approval was obtained from the Scientific Research Ethical Committee of Faculty of Nursing, Helwan University and the researcher clarified the aim of the study to children included in the study. Children's verbal approval was a prerequisite to be recruited in the study. They were assured also that all the gathered data were used for the research purpose only and the study is harmless. Also they were allowed to withdraw from the study at any time without giving the reason. Confidentiality of the gathered data and results were secured.

2.8 Statistical Design:

Data collected from the studied sample was revised, coded and entered using PC. Computerized data entry and statistical analysis were fulfilled using Statistical Package for the Social Sciences (SPSS) version

20.0. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and standard deviations for quantitative variables. Chi-square test (χ^2) was used for comparisons between qualitative variables. Statistical significant was considered at p- value <0.05.

III. Results

Regarding characteristics of the studied children, **table 1** reveals that, 77.5% of the studied children were in the age group from 11 < 12 years with $\bar{X} \pm SD$ 11.90 \pm 1.34 years and 51.1% of them were males. Moreover, 65.7% of them were in the fifth stage and 68.6% of them were having enough family income.

Concerning general technology use of children **table 2** clarifies that, 94.3% of the studied children were having a computer at home and 55.7% of them were having a computer in the bedroom. Also, 31.4% of them were browsing the internet from hour to less than 3 hours per day, 32.5% of them were using computer games three times or more per week and 43.9% of them were using computer games less than 2 hours per day and 92.9% of them were having a cell phone.

Concerning nocturnal technology use of the studied children, **table 3** illustrates that 31.4% of the studied children reported that used the internet every night for social or communications after 10 PM, 30.4% of them used the internet every night for fun after 10 PM and 27.5% of them used the internet every night for education after 10 PM. 26.2% of them reported that their night time of sending and receiving SMS and calls were from 10:12 PM, 61.1% of them reported that sometimes slept during watching TV and 28.2% of them reported that played computer games more than three times per week after 10 PM.

Regarding total technology use (general and nocturnal use) **Figure 1** reveals that 27.5% of the studied children were highly total technology users while 35.0% of them were moderately total technology users. Regarding the effect of technology use on children's daily living activities **table 4** clears that 66.4% of the studied children were having a moderate effect of technology use on their daily living activities.

Table 5 clarifies that there was a highly statistical significant difference between the studied children total pattern of technology use and their effect on daily living activities, where children highly technology users suffered from physical, social and psychological effect with a highly statistically significant difference ($\chi^2 = 39.03, 21.06$ and 53.46 at $p < 0.001$) respectively. In addition to children who were high technology users were suffered from scholastic effect with a statistically significant difference ($\chi^2 = 17.13$ at $p = 0.002$).

IV. Discussion

School age children spend more time mainly using the internet and computer. A part of that time serves a useful purpose like preparing homework, obtaining information and searching. Additionally children spend most of the time playing games, chatting, texting and downloading films, games, music and programs. Excessive and uncontrolled use may cause many physical, psychological, social and academic problems.^[6] So, the current study aimed to assess technology use and daily living activities of school age children.

Regarding the characteristics of the studied children, the findings of the current study (**table 1**) revealed that, more than three-quarters of the studied children were in the age group of 11 > 12 years; ($\bar{X} \pm 11.90 \pm 1.34$ years). These findings were similar to some extent to those of the study by **Aghjayan**^[14] in Chicago, entitled "Electronic device screen time may affect the mental health of school age youth" who revealed that the use of media or electronic devices increased in children aged 6 to 12 years old. From the researchers' point of view, these findings may have been due to school age children independence, their free time and social activities are less controlled by their parents.

The findings of the current study showed that, more than half of them were males. These findings were also congruent with **Zhao et al.**^[15] in Shanghai, entitled "Excessive screen time and psychosocial well-being: the mediating role of body mass index, sleep duration and parent-child interaction" who found that, more than half of children were males. However, these findings were contradicted with the findings of **Hysing et al.**^[16] in Bergen, Norway, entitled " Sleep and use of electronic devices in adolescents; results from large population-based study" who clarified that more than half of children who used electronic devices were females. From the researchers' point of view, these findings may be due to male children are more concerned about playing computer games by using the different applications of the internet compared with females.

Regarding family income the current study revealed that, more than two-thirds of the school age children had enough family income were highly technology use. These findings were emphasized by **Alhantoushi and Alabdullateef**^[17] in Riyadh "Internet addiction among secondary school students" who indicated that children with a high family income had a high percentage of internet addiction. From the researchers' point of view, these findings may have been due to children from families with a high household income received more electronic devices and resources to support their needs.

Regarding the general technology use of children, the findings of the present study (**table 2**) clarified that, the majority of studied children were having a computer at home and more than half of them were having a computer in the bedroom. These findings came in line with **Salceanu**^[18] in Constanta, Romania, entitled "The

influence of computer games on children's development; exploratory study on the attitudes of parents" who indicated that 68.47% of children have one computer in the household. Also, the present findings were in an agreement with **Morsy and Shalaby** ^[19] in Port Said, Egypt, entitled "The use of technology by university adolescent students and its relation to attention, sleep and academic achievement" who found that 84.5% of adolescents reported having computers at home and 50.1% in their bedrooms. From the researchers' point of view, these findings may have been due to the affordability and accessibility of these devices.

According to **Sasmaz et al.** ^[20] in Mersin, Turkey, entitled "Prevalence and risk factors of internet addiction in high school students" who showed that 79% of the students had a computer at home. These findings were emphasized by **Dinleyici et al.** ^[21] in Eskisehir, Turkey, entitled "Media use by children, parents' view on children's media usage" who conducted a study in Turkey, reported that 28.0% of the participants had a computer in their bedroom. The findings of the present study showed that, almost one-third of them were browsing the internet from an hour to less than 3 hours per day. These findings came in line with **Master et al.** ^[22] Ajman, UAE, entitled "Impact of electronic gadgets on psychosocial behavior of middle school children in UAE" who stated that 40.5% of the students spent 2 or more hours surfing the internet, while just 37.9% spent less than 2 hours.

The current study showed that almost one-third of them were using computer games three times or more per week and more than one-third of them using computer games less than 2 hours per day. These findings were in an agreement with the study carried by **Moawad and Ebrahim** ^[23] in Mansoura, Egypt, entitled "The relationship between use of technology and parent adolescent's social relationship" who illustrated that more than half of adolescents spent from 10 to 12 hours per week in playing video games. According to **Wakil et al.** ^[24] in Kurdistan, Iraq, entitled "Impact of computer games on students GPA" who found that more than three quarters (80 %) of students spent from 1- 3 hours per day in playing electronic games and 41.3% of students spent 1-3 hours of internet daily usage after school.

The present study clarified that the majority of the studied children were having a cell phone; these findings were similar to some extent to those of study of **Parola et al.** ^[25] in Paris, entitled "The use of social media modifies teenagers' sleep-related behavior" who reported that 85.2 % of studied children had cell phones. These findings were emphasized by **Gupta et al.** ^[26] in Punjab, India, entitled "Effect of mobile phones on medical students" who found that about 76.4% of students having smartphones.

As regarding nocturnal technology use of the studied children, the present study (**table, 3**) illustrated that almost one-third of the studied children reported that, the internet is used every night for social or communications after 10 PM. Almost one-third of them used the internet every night for fun after 10 PM and more than one-quarter of them used the internet every night for education after 10 PM. These findings were supported by **Amawi et al.** ^[27] entitled "Use of electronic entertainment and communication devices among a Saudi pediatric population" who stated that 24.7% of children used electronic entertainment and communication devices for more than 4 hours per day.

The present findings were consistent with **Moawad and Ebrahim** ^[23] who found that 79.6% of the studied children used computers for Face book and other sites of social media. The present findings were incongruent with **Quarshies** ^[28] in Greater Accra, Ghana, entitled "The impact of computer technology on the development of children" who indicated that 30.9%, 28.7%, 49.2%, 50.1% and 40% of children never use the computer for games, homework, chatting online, sending e-mails and current affairs respectively. From the researchers' point of view, these differences may be due to differences in culture, sample size, sampling method and age group.

The present study illustrated that more than, one-quarter of the studied children reported that their night time of sending and receiving SMS and calls were from 10:12 PM, more than half of them reported that sometimes slept during watching TV and more than one-quarter of them reported that played computer games more three times per week after 10 PM. These findings were in agreement with a similar study **Morsy and Shalaby** ^[19] who found that 87.8% of studied children made phone calls after 10 pm and 61.3% of them reported slept while watching television.

Concerning total technology use (general and nocturnal) use, the current study (**figure 1**) found that more than one-quarter of the studied children were a high total technology use while more than one-third of them were moderate total technology users. These finding came in line with **Khalil et al.** ^[29] in Jeddah, Saudi Arabia, entitled "Prevalence of internet addiction among nursing students and the association with their academic performance and mental health" who done a study in Saudi Arabia, found that 38.4% and 2.1% of the participants were categorized as moderate to severe internet addiction respectively.

In according to **Nafee et al.** ^[30] in Mansoura, Egypt, entitled "Effect of excessive internet use in Saudi and Egyptian teenagers' health: comparative study" who illustrated those levels of internet addiction where near to half of the Saudi and Egyptian students had mild and moderate internet addiction (47.7%, 45.3%, and 44.2%, 46.3% respectively). While severe internet addiction was 0.9% in Saudi one compared to 0.3% in Egyptian students. The present findings were supported by **Sethuraman et al.** ^[31] in Nicobar Island, India, entitled

"Smartphone addiction among children" who described that 85.40% of studied children were high smartphone users and 14.60% were low smartphone user.

Regarding the effect of technology use on children's daily living activities (**table 4**) clears that, 66.4% of the studied children were having a moderate effect of technology use on their daily living activities. The present findings were contradicted with **Winther** ^[32] who revealed that children with no use and excessive used having a small negative impact on psychological wellbeing, while moderate used having a small positive impact.

(**Table 5**) clarifies that, there was a highly statistical significant difference between the studied children total pattern of technology use and their effect on daily living activities, where children were highly technology users were suffered from physical, social and psychological effect with a highly statistically significant difference ($\chi^2= 39.03, 21.06$ and 53.46 at $p = < 0.001$) respectively. In addition to children who highly technology users suffered from scholastic effect with a statistically significant difference ($\chi^2= 17.13$ at $p = 0.002$). The present findings were supported by **Melton et al.** ^[33] entitled "Health-related behaviors and technology usage among college students" who found that there were statistically significant differences between children's technology usage and body mass index, sleep and nutrition at $p < 0.05$.

The current findings were greatly consistent with **El-Houfey and El-Serogy** ^[34] in Assuit city, Egypt, entitled "The effect of television watching habits on the behaviors of primary school children" who revealed that studied children television viewing time, had a negative correlation with activities, social relationships and school achievement, the total level of competence and anxiety and depression. The present findings came in line with **Sampasa and Lewis** ^[35] in Ottawa, Canada, entitled "Frequent use of social networking sites is associated with poor psychological functioning among children and adolescents" who found that there was a significant positive association between movies, serials, video games, screen time and psychosocial health problems among students.

The current findings were supported by **Gupta et al.** ^[26] who stated that there was a highly significant correlation was found between nighttime use of mobile phone and decline in study habits and grades, decrease in concentration, increased frequency of missed classes and being late for classes. The present findings were inconsistent with **khalil et al.** [29] who indicated that there was no association between internet addiction and students' academic performance.

V. Conclusion

In light of the results of the current study and answers to the research questions, it could be concluded that; the great majority of studied children had a computer at home and more than half of them had it in their bedroom. The great majority of them had cell phones. More than one-third of them were moderately total technology users while more than one-fifth of the studied children were highly total technology users while. School-age children with moderate to high use of total technology were had a moderate effect on their daily living activities.

VI. Recommendations

In light of the current study findings the following recommendations are suggested: Pediatric nurses should provide health education for both the school age children and parents about the advantages and disadvantages of technology use. Organize the use of technology by school age children according to their daily living activities. Raising awareness of the school age children about healthy concepts of technology use and daily living activities.

Table (1): Number and percentage distribution of the studied children according to their characteristics (n=280).

Items	(No)	(%)
Age in years:		
10	30	10.7
11<12	217	77.5
>12	33	11.8
$\bar{X} \pm SD$	11.90 ± 1.34	
Gender:		
Male	143	51.1
Female	137	48.9
Educational stage:		

Fifth	184	65.7
Sixth	96	34.3
Family income:		
Not enough	88	31.4
Enough	192	68.6

Table (2): Number and percentage distribution of the studied children according to their pattern of general technology use (n=280).

General technology use	No.	%
Having computer at home:		
No	16	5.7
Yes	264	94.3
Having computer at bedroom:		
No	124	44.3
Yes	156	55.7
Number of hours of browsing internet per day:		
Never	83	29.6
Less than an hour	68	24.3
1 < 3	88	31.4
3 < 6	31	11.1
6 < 9	10	3.6
Frequency of playing computer games per week:		
Never	42	15.0
Once	19	6.8
Twice	53	18.9
Three or more	91	32.5
Every day	75	26.8
Number of hours playing computer games per day:		
Never	43	15.4
< 1	45	16.1
1 < 2	123	43.9
2 < 3	47	16.8
3 and more	22	7.9
Having cell phone:		
No	20	7.1
Yes	260	92.9

Table (3): Number and percentage distribution of the studied children according to their pattern of nocturnal technology use (n=280).

Nocturnal technology use	No.	%
Number of using internet for social or communications after 10 PM:		
Never	131	46.8
1:2times per month	3	1.1
Once per week	21	7.5
More than3 times per week	37	13.2
Every night	88	31.4
Number of using internet for fun after10PM:		
Never	123	43.9
1:2times per month	8	2.9
Once per week	20	7.1
More than 3times per week	44	15.7
Every night	85	30.4
No. of using internet for education after10PM:		
Never	126	45.0
1:2times per month	8	2.9
Once per week	23	8.2
More than 3 times per week	46	16.4
Every night	77	27.5
Time of sending and receiving SMS and phone calls:		
Never	73	26.0
before10 pm	53	18.9
10:12pm	73	26.2
12:3am	16	5.7
3:6am	2	0.7
At any time	63	22.5
Number of sleeping during watching TV:		
Always	92	32.9
Sometimes	171	61.1
Never	17	6.1
Number of playing computer games after10PM:		
Never	108	38.6
2:3times month	36	12.9
More than 3 times week	79	28.2
Every night	57	20.4

Figure (1): Percentage distribution of the studied children according to their total pattern of technology use.

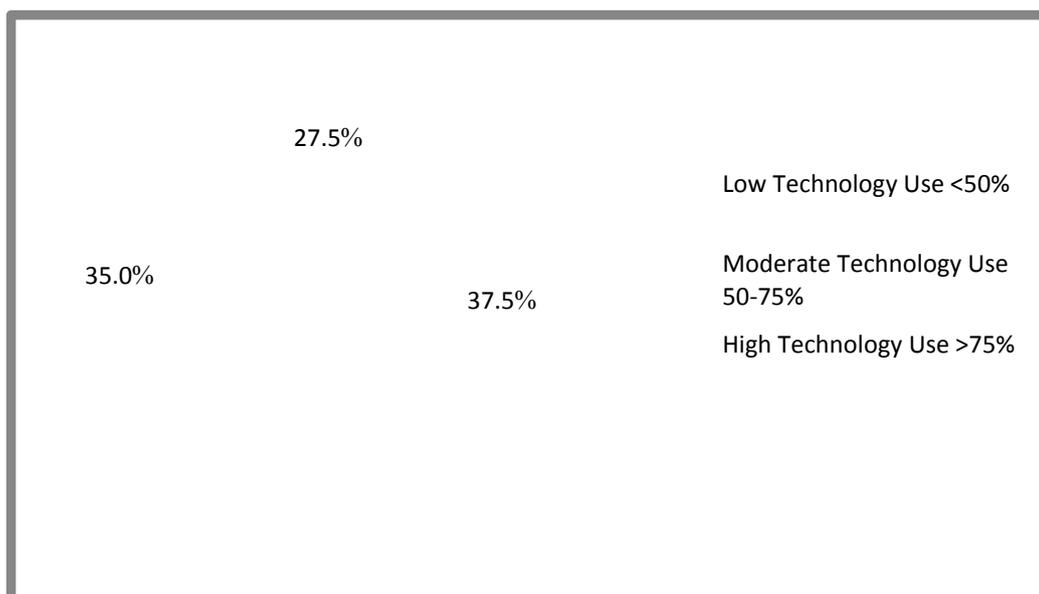


Table (4): Number and percentage distribution of the studied children according to the effect of technology use on children's daily living activities (n=280).

Effect of technology use on children's daily living activities	No.	%
Low	10	3.6
Moderate	186	66.4
High	84	30.0
Total	280	100.0

Table (5): Relation between total pattern of technology use and their effect on daily living activities (physical, social, psychological and scholastic) of the studied children (n=280).

Effect on children's daily living activities	Total technology use effect						X ²	p-value
	Low (n=105)		Moderate (n=98)		High (n=77)			
	No.	%	No.	%	No.	%		
Physical effect								
Low	5	4.8	1	1.0	6	7.8	39.03	<0.001**
Moderate	37	35.2	73	74.5	29	37.7		
High	63	60.0	24	24.5	42	54.5		
Social effect								
Low	22	21.0	20	20.4	9	11.7	21.06	<0.001**
Moderate	63	60.0	71	72.4	42	54.5		
High	20	19.0	7	7.1	26	33.8		
Psychology effect								
Low	39	37.1	36	36.7	12	15.6	53.46	<0.001**

Moderate	47	44.8	59	60.2	29	37.7		
High	19	18.1	3	3.1	36	46.8		
Scholastic effect								
Low	1	1.0	3	3.1	0	0.0	17.13	0.002*
Moderate	16	15.2	19	19.4	1	1.3		
High	88	83.8	76	77.6	76	98.7		

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