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The Role of Physiotherapy in the treatment of Neck Muscle Spasm in Pediatric result from overuse of Smart Phone

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Abstract: ***This study investigated the role of physiotherapy in treating neck muscle spasm in children aged 6–12 years caused by overuse of smartphones. Using a quantitative design, data were collected through a two-part questionnaire. The first section gathered demographic information, while the second comprised 24 items exploring the role of physiotherapy in managing neck muscle spasms. Findings revealed a high prevalence of neck pain among children in Bethlehem and a significant relationship between smartphone overuse and neck pain, accompanied by psychological effects such as irritability, stress, anxiety, depressive symptoms, sleep deprivation, family conflict, and cyberbullying victimization. Physiotherapists play a crucial role in addressing neck muscle spasms in this context. No significant differences in parental perceptions of physiotherapy's role were attributed to age, education, or child's gender, but differences were noted based on the relation to the child, favoring mothers. Based on the results, the researchers recommended educating parents on healthier smartphone usage methods and durations for children and encouraging physiotherapists to conduct awareness programs on physiotherapy and its therapeutic modalities.***

Keywords: Physiotherapy; Neck Muscle Spasm; Smartphone Overuse; Pediatric Health; Parental Perceptions.

1. Introduction

The widespread use of smartphones has significantly increased in recent years, impacting individuals' physical and mental health in numerous ways. Among children and adolescents, who constitute over 50% of the population in certain communities, the potential effects of smartphone overuse are particularly concerning. This study focuses on examining the role of physiotherapy in treating neck muscle spasms in children aged 6–12, resulting from excessive smartphone use, to better understand and address these impacts [1]. Smartphones and other electronic devices have become indispensable across all age groups and communities. Their physical and psychological effects are still being explored, with studies showing dramatic increases in smartphone use over the past decade—from 33% in 2011 to 93% in 2024. Poor neck posture, such as forward head posture, commonly observed during smartphone usage, is associated with neck pain. Research indicates correlations between smartphone use and musculoskeletal pain, including a Finnish study reporting weekly neck pain in 26% of individuals aged 14–18 and an English study showing 27% of schoolchildren aged 12–14 experienced neck pain at least once a month. Additionally, a Shanghai study involving 3,600 high school students revealed significant increases in neck and back pain linked to prolonged digital device use [2].

Neck pain is a prevalent health issue that can originate from various structures, including intervertebral discs, muscles, and ligaments, and is often categorized as musculoskeletal neck pain when no systemic illness is detected [3]–[7]. Smartphone overuse exacerbates this condition, as continuous forward neck posture applies mechanical stress on the neck and shoulder muscles, leading to pain and discomfort. In addition to physical issues, smartphone overuse has psychological repercussions, such as sleep disturbances, anxiety, and social challenges. Addressing this issue is vital, as its effects on children's health, behavior, and overall well-being have raised societal concerns [8].

Despite the evident link between smartphone overuse and physical and psychological problems in children, many parents inadvertently contribute to this issue. For instance, mothers may use smartphones as a distraction for their children, while fathers may overlook the associated risks due to work commitments [9][10]. This lack of awareness regarding the negative effects of prolonged smartphone use on children's social, health, and behavioral development underscores the need for interventions. Previous studies highlight these detrimental effects, but there is a gap in understanding how physiotherapy can specifically address neck muscle spasms caused by smartphone overuse in children.

The primary objective of this study is to evaluate the role of physiotherapy in managing neck muscle spasms in children aged 6–12 resulting from excessive smartphone use. Additional goals include raising parental awareness about the physical and psychological effects of smartphone overuse, educating parents on proper smartphone usage habits for children, and encouraging healthier practices that support children's physical and social well-being. By addressing these aspects, the research aims to contribute to the effective prevention and treatment of neck-related problems in pediatric populations.

2. Materials and Method

This research adopted a quantitative approach, employing a descriptive-analytic study design. The study was based on a structured questionnaire to collect and analyze data, aiming to understand the role of physiotherapy in managing neck muscle spasms in children aged 6–12 years due to excessive smartphone use.

The study was conducted in Bethlehem city, targeting parents of children aged 6–12 years. A convenience sample of 50 parents was selected randomly from the study population. This sample was chosen to represent the broader population and provide insights into the research questions.

A questionnaire was developed as the primary data collection tool. It consisted of two sections: the first gathered demographic information about the participants, and the second addressed specific research questions. Before participation, the study's purpose was explained to the sample, and participants were informed about their right to withdraw at any stage. Data collection involved direct engagement with families at rehabilitation centers such as the Arab Society Rehabilitation Hospital, Nour Rehabilitation, Caritas Hospital, and Life Gate Rehabilitation, as well as outreach through social media platforms targeting families in Bethlehem. Completed questionnaires were analyzed using SPSS software to extract statistical insights.

Descriptive statistics were used to summarize the study sample, including frequencies, percentages, and significance values to address the research questions and test hypotheses. Ethical considerations were strictly adhered to, with prior approval obtained from the university to conduct the research. Participant privacy and confidentiality were maintained, and no personal information was published.

3. Results and Discussion

The study revealed that all children (100%) aged 6–12 in Bethlehem use smartphones, with 72% exceeding three hours of daily usage (Table 1). A significant majority (94%) reported experiencing neck pain associated with smartphone use, with 74% describing it as moderate and 12% as severe (Table 2). These findings align with prior research highlighting the strong correlation between prolonged smartphone use and musculoskeletal issues, such as Alzaid et al. (2018) and Alonazi (2017).

Table 1. Duration of Smartphone Daily Usage

Duration	Frequency	Percentage
1–2 hours	3	6%
2–3 hours	11	22%
>3 hours	36	72%

Table 2. Pain Degree Reported by Children

Pain Degree	Frequency	Percentage
No pain	7	14%
Moderate pain	37	74%
Worst pain	6	12%

The data indicated that 52% of children reported neck pain only, while 48% experienced pain in both the neck and shoulders (Table 3). Additionally, 48% of parents sought physiotherapy for their children, reinforcing the role of physical therapy in addressing musculoskeletal symptoms from poor posture during prolonged smartphone use, as supported by Park et al. (2013).

Table 3. Pain Complaint Area

Complaint Area	Frequency	Percentage
Neck only	26	52%
Neck and shoulder	24	48%

Parents reported significant psychological impacts of smartphone use on children, including stress (46%), irritability (22%), and symptoms of depression (14%) (Table 4). Furthermore, 50% experienced sleep deprivation, and 40% encountered family conflicts. These findings underscore the emotional toll of excessive screen time, as emphasized by Domoff et al. (2019).

Table 4. Psychological Effects of Smartphone Use

Effect	Frequency	Percentage
Irritability	11	22%
Stress	23	46%
Anxiety	9	18%
Depression symptoms	7	14%

A majority (92%) of parents acknowledged the role of physiotherapy in treating neck muscle spasms caused by smartphone overuse (Table 5). Additionally, 82% actively limited their children's smartphone use due to neck pain. Despite this, only 42% of children engaged in physical activities, highlighting the need for increased preventive measures.

Table 5. Parents' Belief in Physiotherapy's Role

Belief in Physiotherapy's Role	Frequency	Percentage
Yes	46	92%
No	4	8%

The study identified widespread knowledge of physiotherapy among parents, with 72% aware of various treatment modalities like heat therapy, massage, and ultrasound. Moreover, 36% recognized its ability to reduce pain and stiffness, while 26% noted its role in improving neck mobility (Table 6).

Table 6. Goals of Physiotherapy for Neck Pain

Goal	Frequency	Percentage
Reduce pain and stiffness	18	36%
Improve head and neck range of motion	13	26%
Develop dynamic strengthening of musculature	11	22%
Prevent pain from recurring	8	16%

One Way Anova Test was conducted in Table 7 to test if there are no significant differences in the role of physiotherapy in the treatment of neck muscle spasm in pediatric that result from overuse of smartphone from the perspective of parents in Bethlehem attributed to parent's age.

Table 7:One way Anova test resulted to parent's age:

ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.197	3	.066	2.298	.090
Within Groups	1.318	46	.029		
Total	1.515	49			

The table shows that the value of sig. was (0.090) and this is more than the statistical significance (0.05). This

means that there are no significant differences in the role of physiotherapy in the treatment of neck muscle spasm in pediatric that result from overuse of smartphone from the perspective of parents in Bethlehem attributed to parent's age. So, we accept the hypothesis.

One Way Anova Test was conducted in table 8 to test if there are no significant differences in the role of physiotherapy in the treatment of neck muscle spasm in pediatric that result from overuse of smartphone from the perspective of parents in Bethlehem attributed to parent's education.

Table8: One-way Anova test results related to parent's education.

ANOVA					
Total					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.014	2	.007	.225	.799
Within Groups	1.501	47	.032		
Total	1.515	49			

The table shows that the value of sig. was (0.79) and this is more than the statistical significance (0.05). This means that there are no significant differences in the role of physiotherapy in the treatment of neck muscle spasm in pediatric that result from overuse of smartphone from the perspective of parents in Bethlehem attributed to education, so we accept the hypothesis.

T-test was conducted in table 9 if there are no significant differences in the role of physiotherapy in the treatment of neck muscle spasm in pediatric that result from overuse of smartphone from the perspective of parents in Bethlehem attributed to relation to the child.

Table 9 :T-test results related to relation to the child:

Group Statistics					
	Relation	N	Mean	Std. Deviation	Std. Error Mean
Total	Father	16	1.7568	.17008	.04252
	Mother	34	1.9547	.17206	.02951

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	Df	Sig. (2-tailed)
Total	Equal variances assumed	.000	.092	-1.883-	48	.046
	Equal variances not assumed			-1.891-	29.787	.068

The table 9 shows that the value of sig. was (0.04) and this is less than the statistical significance (0.05). This means that there are significant differences in the role of physiotherapy in the treatment of neck muscle spasm in pediatric that result from overuse of smartphone from the perspective of parents in Bethlehem attributed to relation to the child, So we reject the hypothesis. As shown in the table above, the differences were for the benefit of mothers who gained the higher mean. This means that mothers are more aware about the role of physiotherapy in this case.

T- Test was conducted and the following table 10 if there are no significant differences in the role of physiotherapy in the treatment of neck muscle spasm in pediatric that result from overuse of smartphone from the perspective of parents in Bethlehem attributed to child's gender.

Table10: T-test results related to child's gender.

Group Statistics						
	Childs_gender		N	Mean	Std. Deviation	Std. Error Mean
Total	dimension 1	Male	22	1.9261	.17248	.03677
		Female	28	1.9211	.18156	.03431

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	T	df	Sig. (2-tailed)
Total	Equal variances assumed	.092	.763	.099	48	.922
	Equal variances not assumed			.100	46.229	.921

The table shows that the value of sig. was (0.92) and this is more than the statistical significance (0.05). This means that there are no significant differences in the role of physiotherapy in the treatment of neck muscle spasm in pediatric that result from overuse of smartphone from the perspective of parents in Bethlehem attributed to child's gender, so we accept the hypothesis.

4. Conclusion

Neck pain is prevalent among children aged (6-12) years old in Bethlehem and there is a relationship between overuse of smartphones and neck pain. The psychological effects on the children using smartphones include: Irritability, stress, anxiety, depression symptoms, sleep deprivation, family conflict, and Cyber bullying victimization. A physical therapist has an important role in the treatment of neck muscle spasm in pediatric that result from overuse of smartphone.

The limited time of the research and the small sample lead to the inability to generalize our results. So, there is a need for other researched to be conducted on the same subject on bigger and more comprehensive samples

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