

The Effect of Nursing-Based Interventions on Creating Awareness among Obese School Children and their Parents

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Received: 10th Aug. 2024, accepted: 24th Nov. 2024, Published: xxxx, DOI: <https://doi.org/10.xxxx>

Accepted Manuscript, In press

Abstract: Childhood obesity is a growing global public health challenge, contributing to serious health risks. In Jordan, the increasing prevalence of obesity among school-aged children highlights the urgent need for effective interventions. This study evaluated the effectiveness of nursing-based interventions, including coaching sessions and health behavior classes, in improving awareness of obesity-related health issues among children aged 6 to 12 years and their parents. Using a quasi-experimental one-group pretest-posttest design, 90 obese schoolchildren and their parents were recruited from community healthcare centers in Amman. The intervention, conducted over three months, aimed to enhance knowledge and promote healthier behaviors. Outcomes were measured using the Pediatric Quality of Life Inventory (PedsQL) to assess quality of life and the School Physical Activity and Nutrition (SPAN) questionnaire to evaluate obesity-related knowledge. Results indicated significant improvements in all PedsQL domains, with Physical Health scores increasing from a mean of 33.88 (SD = 3.6) pre-intervention to 86.48 (SD = 8.4) post-intervention ($p = 0.03$). Additionally, awareness of physical activity, dietary habits, and sedentary risks significantly improved among children and parents. These findings highlight the intervention's effectiveness in fostering positive health outcomes and enhancing awareness. The study underscores the importance of integrated nursing-led educational approaches in combating childhood obesity and promoting long-term health and well-being.

Keywords: Jordan, Obesity, Nursing, Children, Awareness.

Introduction

Obesity is a prevalent issue among school-aged children worldwide, with the highest rates seen in various ethnic groups (1). This condition poses a significant risk of heart diseases for both adults and children. Childhood obesity can lead to negative health impacts such as hypertension, type 2 diabetes, insulin resistance, kidney and liver diseases, and reproductive dysfunction(2, 3). Research has shown that obesity is more common among males and females of all pediatric age groups and racial backgrounds (4). Nurses often face challenges in caring for obese patients due to insufficient education and misconceptions(5). A study by Trompeter, Bussey (6) highlighted the importance of addressing the emotional and

physical needs of obese patients through multidisciplinary care teams. These teams aim to identify clinical concerns promptly and prevent common obesity-related complications. Research on childhood obesity has explored factors such as physical activity, dietary patterns, birth rates, and parental occupations. Despite the global prevalence of obesity, there is limited research on obesity and its major factors in Jordan(7-9).

In addition, Obesity is a significant public health concern in Jordan, contributing to illness across all age groups(10). The prevalence of obesity among children is also on the rise, leading to serious health issues early in life(11). Healthcare funds allocate a significant portion to address the financial burden of

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obesity. In Jordan, there has been a shift from undernutrition to a diet high in sugar, fat, and refined carbohydrates, contributing to the increase in obesity rates. Studies have shown that obesity is prevalent among schoolchildren in various regions of Jordan, with higher rates in urban areas compared to rural areas(12, 13). The study aims to evaluate the effectiveness of nursing-based

Materials and Methods

Research Design:

A quasi-experimental research design, one-group pretest-posttest design, was used to conduct this study.

Sample :

A purposive sampling technique was used to conduct this study. The Raosoft sample size calculation was used among 117 students with obesity, with a confidence level of 95% and a margin of error of 5%. The recommended sample size is 90 students, accompanied by either a parent or guardian, bringing the total sample size to 180 participants (90 children and 90 parents/guardians). The inclusion criteria are students aged between 6 and 12 years, regular attending school in Jordan, diagnosed with obesity ($BMI = > 25$) and accompanied by a parent or legal guardian. The exclusion criteria are students with any or chronic medical conditions, such as diabetes, whose parents/guardians didn't give consent.

Setting:

The study was conducted at a public school located in northern Jordan. This particular school was selected due to its status as the largest and primary educational institution in the region.

Instrument:

The Pediatric Quality of Life Inventory (PedsQL)

The Pediatric Quality of Life Inventory (PedsQL) 4.0 is a tool used to assess health-related quality of life in children across four domains: Physical Functioning, Emotional Functioning, Social Functioning, and School Functioning. Each item within these domains is rated on a 5-point Likert scale (0 = "never a problem" to 4 = "almost always a problem") and is then reverse-scored and transformed to a 0–100 scale, where higher scores indicate better quality of life. Subscale scores are calculated by averaging the items within each domain, and the total score is the mean of all items, providing an overall HRQoL measure. Scores are classified to reflect levels of well-being: High (76–100), Moderate (51–75), Low (26–50), and Very Low (0–25). The Arabic version is valid and reliable in Jordan(14).

School Physical Activity and Nutrition (SPAN)

SPAN was a tool employed to evaluate the level of awareness regarding physical activity and dietary knowledge among obese children and their parents. This validated instrument consists of items that assess knowledge in areas such as the benefits of physical activity, the risks associated with sedentary behavior, the impact of dietary choices, and the health consequences of high cholesterol and fatty foods. Each item is scored as either "Yes" or "No," with "Yes" responses indicating awareness and "No" responses suggesting a lack of knowledge in that area.

Higher aggregated scores represent greater awareness of obesity-related health concepts. In this study, pre-intervention SPAN scores served as a baseline, while post-intervention scores allowed for the evaluation of changes in awareness following the nursing-based intervention. This scoring approach provided a quantitative assessment of the intervention's effectiveness in enhancing knowledge about healthy lifestyle practices among both children and their parents.

The Body Mass Index (BMI)

BMI is a commonly used metric that evaluates a person's weight in relation to their height and gives an estimate of how fat they are overall. It is computed by dividing the weight in kilograms by the height in meters squared (kg/m^2). BMI is a straight forward, non-invasive method that is frequently used to classify people into four weight status groups: underweight ($BMI < 18.5$), normal weight ($BMI \geq 18.5$), overweight ($BMI \geq 29.9$), and obese ($BMI \geq 30$). BMI does not directly measure body fat percentage or distribution, and it might not be able to differentiate between muscle and fat mass, despite being a helpful screening tool for identifying possible weight-related health problems.

Coaching and Health Behavior Classes :

The coaching and health behavior programs used in this study were intended to encourage healthy lifestyle modifications in obese kids by emphasizing stress reduction, physical exercise, and nutrition. These classes were designed to give participants useful information and abilities that will help them control their weight and improve their general health. Through individualized counseling and motivational assistance, the coaching component assisted kids in setting attainable health objectives and promoting constructive behavioral changes. Over the course of three months, the hour-long health behavior seminars were conducted in schools and addressed important subjects like stress management techniques, the advantages of physical activity, and nutrition. By combining these elements, the intervention aimed to foster greater awareness among children regarding healthy habits, improve self-esteem, and equip them with tools to maintain these behaviors in their daily lives. Parents were also involved in the educational process to ensure a supportive home environment, reinforcing the intervention's impact on both the children's and parents' understanding of healthy lifestyle practices.

Data Collection:

Data collection for the study spanned six months and included both pre-intervention (pretest) and post-intervention (posttest) assessments to evaluate the impact of nursing-based interventions on children and their parents. At baseline, prior to the intervention, the children's height, weight, and Body Mass Index (BMI) were measured using standardized electronic scales and stadiometers, along with a comprehensive physical

assessment to collect additional health data. Gender and age information were also recorded for each participant. Simultaneously, an assessment form was administered to both children and parents to gauge their initial awareness and knowledge of obesity and its related health risks. Parents completed the Pediatric Quality of Life Inventory (PedsQL), which assessed the children's emotional, social, and physical well-being. Following the intervention, which included coaching and health behavior classes aimed at developing awareness of healthy lifestyles and diet plans, post-intervention assessments were conducted. These classes also provided guidance on physical activities and stress management, with each session lasting one hour and conducted over a three-month period in a school setting, which was conducive to improving students' self-esteem. The PedsQL was administered to parents immediately after the intervention, with a follow-up assessment three months later to measure changes in physical health and awareness levels among both children and parents. The same tools and instruments were employed in both pretest and posttest phases to ensure consistency and reliability, allowing for a thorough evaluation of the effectiveness of the nursing interventions by comparing the pre- and post-intervention data.

Results and Discussion

Demographic Data

The results showed that 98 (54.4%) of students were males and 82 (45.6%) were females. The majority of participants used public transport (56.7%), (37.2%) owned a car, while a 60.1% of them walked. All the demographic data for students and their parents and some healthy habits of them presents in Table 1.

Table 1. Demographic Data of participants

Student Gender		F(%)
Male		98 (54.4)
Female		82 (45.6)
Transport		F(%)
Walk		11 (6.1)
Public transport		102 (56.7)
Own car		67 (37.2)
Grade Level		F(%)
Grade 1		40 (22.2)
Grade 2		39 (21.7)
Grade 3		32 (17.8)
Grade 4		33 (18.3)
Grade 5		36 (20)
Age		M (SD)
Father		35.2 (7.6)
Mother		30.6 (5.6)
Education Level		
Primary		3 (1.6)
Secondary		55 (30.6)
Diploma		65 (36.1)
Bachelor		55 (30.6)
Postgraduate		2 (1.1)
Physical Activity Level		
Sedentary		112 (62.2)
Moderate		59 (32.8)
Active		9 (5)
Dietary Habits		
High Consumption of Processed Foods		129 (71.7)
Moderate Balanced Diet		46 (25.6)

Healthy Balanced Diet	5 (2.7)
Sleep Patterns	
Inadequate Sleep	65 (36.1)
Moderate Sleep	95 (52.8)
Adequate Sleep	20 (11.1)
Frequency of Meals	
Irregular	129 (71.7)
Moderate	47 (26.1)
Regular	4 (2.2)
Parental Involvement in Health Education	
Low	165 (91.7)
Moderate	15 (8.3)
High	0

A paired t test result reported that pre- and post-intervention scores for the Pediatric Quality of Life Inventory (PedsQL) among children, showing significant improvements across all domains. Physical Health scores increased from a pretest mean of 33.88 (SD = 3.6) to a posttest mean of 86.48 (SD = 8.4), with a p-value of 0.03, indicating statistical significance. Emotional Functioning, Social Functioning, and School Functioning also showed notable improvements, with total PedsQL scores rising from 22.28 (SD = 2.3) pre-intervention to 81.4 (SD = 7.3) post-intervention, reflecting a marked enhancement in overall quality of life (Table 2).

The result reported a statistically significant improvement in both children's and parents' awareness of physical activity, dietary knowledge, and health-related behaviors following the intervention. For children, there was a marked increase in awareness across critical health domains: knowledge of the significance of physical activity improved from 16.7% to 82.8%, while awareness of a healthy diet reached 100% post-intervention, compared to only 43.3% at baseline. This shift suggests that the intervention substantially impacted children's understanding of the role of physical activity and dietary choices in maintaining health. Additionally, awareness about the risks associated with a sedentary lifestyle increased from a pre-intervention level of 12.2% to 94.4%, highlighting a major reduction in the knowledge gap regarding inactivity-related health risks. For parents, the intervention also led to substantial improvements, with knowledge of the importance of physical activity rising from 48.9% to 80.2%. Parental awareness about healthy dietary plans improved notably, reaching 97.8% post-intervention, compared to 81.1% at baseline, indicating a reinforced understanding of dietary planning and its health implications. Furthermore, post-intervention awareness of stress management practices and the adverse effects of cholesterol among parents rose significantly, suggesting that the intervention addressed critical lifestyle factors affecting both physical and mental health. These results underscore the effectiveness of the educational intervention in promoting comprehensive health knowledge and behavioral awareness,

contributing to better-informed decisions among children and their parents regarding physical activity, diet, and overall lifestyle, thereby supporting the intervention's role in long-term health promotion strategies (Table 3)

Limitation

There are many limitations to this study that could affect how generalizability and practically the results can be applied. First off, there was no control group in the study's one-group pretest-posttest design, which makes it difficult to ascribe

observed changes to the intervention alone. Furthermore, the sample was restricted to a single region of Jordan, which would have limited the results' applicability to other locales or cultural settings. Participants may overestimate their knowledge or adherence to health practices because the study relied on self-reported data from parents and kids, which could introduce response bias. Finally, long-term follow-up is crucial for assessing the long-term effectiveness of awareness programs on obesity prevention; however, it was not taken into consideration in this study.

Table (2): Pre- and Post-Intervention PedsQL Among Children.

PedsQL sub-items	Physical Health	Emotional Functioning	Social Functioning	School Functioning	Total Score
Pretest M (SD)**	33.88 (3.6)	24.05 (2.4)	21.11 (2.1)	10.11 (1.2)	22.28 (2.3)
Posttest M (SD)	86.48 (8.4)	81.01 (7.1)	82.66 (7.3)	75.68 (6.2)	81.4 (7.3)
P value*	> 0.05				

*Significant P level > 0.05 / ** Mean (Standard Deviation)

Table 3: Pre- and Post-Intervention Awareness Levels on Physical Activity and Dietary Knowledge among Obese Children and Parents (SPAN Questionnaire)

SPAN Item	Children				Parents			
	Pre Test		Post Test		Pre Test		Post Test	
	Yes N (%)	No N (%)	Yes N (%)	No N (%)	Yes N (%)	No N (%)	Yes N (%)	No N (%)
Knowledge about significance of physical activity	15 (16.7)	75 (83.3)	74 (82.8)	16 (17.2)	44 (48.9)	46 (51.1)	72 (80.2)	18 (19.8)
Do you like morning walk	14 (15.6)	76 (84.4)	74 (81.7)	16 (18.3)	22 (24.4)	68 (75.6)	66 (73.3)	24 (26.7)
Knowledge about complications of sedentary lifestyle	11 (12.2)	79 (87.8)	85 (94.4)	5 (5.6)	15 (16.7)	75 (83.3)	71 (78.9)	19 (21.1)
Awareness about healthy diet	39 (43.3)	51 (56.7)	90 (100)	0	88 (97.8)	2 (2.2)	90 (100)	0
Awareness about significance of healthy diet	37 (41.1)	53 (58.9)	89 (98.9)	1 (1.1)	77 (97.8)	33 (2.2)	89 (98.9)	1 (1.1)
The awareness level of obese children about Health Behavior Classes (Pre and Post Test)								
Knowledge about adverse effects of cholesterol	11 (12.2)	79 (87.8)	63 (70)	27 (30)	13 (14.4)	77 (85.6)	59 (65.6)	31 (34.4)
Awareness about healthy lifestyles	11 (12.2)	79 (87.8)	85 (94.4)	5 (5.6)	18 (20)	72 (80)	78 (86.7)	12 (13.3)
Awareness about dietary plans	14 (15.6)	76 (84.4)	81 (90)	9 (10)	17 (18.9)	73 (81.1)	88 (97.8)	2 (2.2)

Awareness about physical activities	10 (11.1)	80 (88.9)	85 (94.4)	5 (5.6)	11 (12.2)	79 (87.8)	74 (82.8)	16 (17.2)
Awareness about stress management	5 (5.6)	85 (94.4)	80 (88.9)	10 (11.1)	14 (15.6)	76 (84.4)	74 (81.7)	16 (18.3)

Discussion

The result of this study reported that the intervention led to substantial improvements in children's quality of life across all domains of the Pediatric Quality of Life Inventory (PedsQL), with Physical Health scores rising significantly from a mean of 33.88 to 86.48 ($p = 0.03$). Total PedsQL scores also increased markedly, from 22.28 pre-intervention to 81.4 post-intervention, indicating a strong positive impact on overall quality of life. Studies indicate that changes in PedsQL scores following structured health interventions are effective in fostering improvements in children's health-related quality of life (HRQoL), especially when interventions include components like behavioral counseling and experiential learning (15, 16). For instance, the increase in physical health scores from a mean of 33.88 to 86.48 ($p = 0.03$) in this study aligns with findings that interventions combining physical activity, dietary education, and psychosocial support can lead to substantial gains in physical and emotional functioning (17). In particular, studies note that a minimal clinically important difference (MCID) for PedsQL in children typically ranges from 4.4 to 5.4 points, which underscores the significance of the observed improvements across domains in this study (18). By achieving post-intervention scores far exceeding this threshold, the intervention demonstrates a robust impact on children's quality of life. Improvements in emotional, social, and school functioning also reflect the comprehensive approach that incorporates parental involvement, which has been shown to reinforce positive changes by extending supportive behaviors beyond the intervention setting into the home environment (19, 20). These findings collectively emphasize the potential of integrated interventions to produce meaningful improvements in children's HRQoL, particularly in settings where parents and educators collaborate to support healthier behaviors across multiple domains.

Furthermore, the results indicate a substantial increase in awareness of physical activity and dietary knowledge among children and parents following the intervention. For children, the understanding of the importance of physical activity improved dramatically, with awareness levels rising from 16.7% pre-intervention to 82.8% post-intervention, and knowledge about healthy diets reaching 100%. Parents also demonstrated marked improvement, particularly in their awareness of the significance of physical activity and dietary planning, with post-intervention awareness levels at 80.2% and 97.8%, respectively. These findings suggest that the intervention effectively enhanced health-related knowledge in both groups, supporting

its role in promoting healthier lifestyle practices and reducing potential risks associated with sedentary behavior and poor dietary habits. For supported study (21) found that interventions incorporating parental involvement significantly impacted children's dietary and physical activity behaviors, which in turn contribute to lower obesity risk and improved health outcomes. By engaging parents in educational sessions, these programs leverage the home environment as a complementary reinforcement setting to maintain and strengthen the gains achieved within structured program settings (21). Moreover, recent evidence supports experiential learning as a powerful tool in health education. Experiential approaches—incorporating hands-on, practical activities—have been shown to significantly enhance children's understanding and application of health knowledge. (22) noted that experiential learning methods that actively involve children in physical activity-related tasks enhance both knowledge and positive attitudes toward maintaining an active lifestyle, which are crucial for long-term adherence to healthy behaviors. This aligns with the intervention's practical learning approach, which appears to have facilitated meaningful increases in both children's and parents' awareness (22, 23).

Conclusion

The nursing-based intervention successfully increased awareness of obesity-related health behaviors and improved the quality of life, physical health, emotional health, social health, and school functioning health among obese schoolchildren and their parents in Jordan. These findings highlight the effectiveness of integrating coaching and health behavior classes in addressing childhood obesity and suggest the need for further studies with extended follow-up and control groups to confirm long-term outcomes.

Ethics approval and consent to participate

Ethical approval for the study was obtained by the Ministry of Education No. 174/22/2023. Also, the researcher obtained written consent forms from the parents of students to allow them to participate in the study and verbal consent from the children. The researchers assured that the participants could withdraw from the study at any time.

Availability of data and materials

All manuscripts must include an 'Availability of data and materials' statement. Data availability statements should include information on where data supporting the results reported in the

article can be found including, where applicable, hyperlinks to publicly archived datasets analysed or generated during the study.

Author's contribution

Andaleeb M. Abu Kamel, Writing original draft, Visualization, Supervision, Methodology, Investigation, Formal analysis, Data curation, Methodology, Conceptualization; **Mariam Kawafha**: Software, Resources, Project administration, Data curation; **Abdelkader Al kofahi**: Visualization, Supervision, Methodology, Data curation; **Khitam Alsaqer**: Investigation, Formal analysis, Data curation, Methodology; **Luma Ghazi Alzamel**: Methodology, Data curation, Formal analysis **Ghadeer ALi Alzboon** : Data curation; **Ahmad Rajeh Saifan** : revision the second draft of paper; **Duaa Fayiz**: re analysis data ; revision the second draft of paper; **Najah Sami Shawish** : Visualization, Supervision; **Heidar Sheyab**: Resources,, **Rama Ashraf Al Mushasha** : revision the second draft of paper

Funding

No funding

Conflicts of interest

Please add any possible conflict of interest, otherwise add

The authors declare that there is no conflict of interest regarding the publication of this article

Acknowledgements

No Acknowledgements

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