

Impact of Health Education on Kindergarten Teachers: An Intervention Study

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Abstract: The purpose of the study was to explore the extent of kindergarten teachers knowledge and evaluate the effectiveness of an intervention education program delivered to a group One hundred and sixty female Kindergarten Teachers in 15 schools in Elmaadi and Helwan educational Governorates from 2021-2022. Cairo-Egypt. *Stage I:* preliminary study and Intervention. The data was collected by an interview questionnaire including the socio-demographic characteristics, knowledge about Nutrition, communicable diseases and first aid. *Stage II:* To clarify the impact of the intervention program three months later Pre-test results showed that high percentage of kindergarten teachers had insufficient knowledge about nutrition, infectious diseases and first aid. A significant increase in overall knowledge and attitude was detected among them after attending health education sessions. A highly significance difference was found between pre-test and posttest results ($p < 0.001$). In conclusion: According to our results of the pre-test of our study showed that high percentage of kindergarten teachers had insufficient of knowledge about nutrition, infectious diseases and first aid. A significant increase in overall knowledge and attitude was detected among them after attending health education sessions ($p < 0.001$).

Key words: Kindergarten teachers • Educational intervention • Knowledge and attitude • Nutrition • Infectious diseases and first aid

INTRODUCTION

Schools can make a significant contribution to a student's health and well-being, the connection between health and education is well recognized worldwide [1, 2]. Kindergarten teachers are an essential joining link in all health education systems. They affect children's attitude to health, encourage them to take care of themselves and to live healthy. Children's health education importance was acknowledged and analyzed in various research articles [3].

The children not only gain knowledge about appropriate and balanced nutrition in preschool period, but also acquire good eating habits. Teachers should have a background of each child's nutritional needs and they could find any malnutrition problem when they arise [4].

Preschool education institution is a favorable context to take care of children's health, develop healthy lifestyle skills, gain various health care activities considering the child's development peculiarities. Kindergarten teachers should train their learners to receive their body needs, to

express the opinion about their health status. So, it is important to be knowledgeable in a modern methodological, interesting way to establish preschool education in respect to health literacy formation [5].

In the preschool period nutrition education in the early years of life is particularly important for an individual's health throughout life. Nutrition education should be continuous, directed and tailored to all family members [6].

Teachers play a fundamental role in giving health education to school children about infectious diseases [7]. We can prevent and control the spread of infectious diseases by giving appropriate knowledge and adequate training to teachers. Kindergarten's teacher has crucial role in children care, supervision and prevention of health hazards. A knowledgeable teacher would be able to identify a disease in any of his students in the preliminary period of infection [8].

School environment in which injuries may affect students and a major place where situations of urgency and emergency occur. Kindergartens are the best place to give care to those children in absence of mothers.

Children spend a massive portion of their day in kindergartens, so pediatric emergencies such as the accidental physical injuries are more likely to occur in them. The teachers have a significant chance to be present and take action during an emergency situation. They should be well-oriented about first aid procedures and professionally qualified to perform first aid procedure [9, 10].

MATERIAL AND METHODS

The present study is an intervention study with comparison or the long term impact of health education program pre-and post-intervention.

Subjects: One hundred and sixty female Kindergarten Teachers. The study was conducted in 15 schools in Elmaadi and Helwan educational Governorates from 2021-2022.

Methods: One hundred and sixty female Kindergarten Teachers were given an idea about the nature of the study as it would extend for three meetings. Stage I: Intervention and Stage II: Post intervention). The preliminary study extended for three weeks and included all Kindergarten Teachers who accepted to participate in the study. The data were collected by an interview questionnaire including the socio-demographic characteristics, Information obtained including: Personal and socio-economic data, age, qualification, experience and source of health information, training of first aid, The questionnaire included also Nutrition's Knowledge and information regarding the importance of breakfast, the danger of fast food, causes and prevention of obesity, the manifestation of malnutrition and canned food contains harmful preservatives. The questionnaire included also awareness about communicable diseases, the ways of spreading of the infectious diseases and their prevention and the relation between bad hygiene and transmission of infectious diseases, The questionnaire included also first aid's Knowledge about first aid of wound, epistaxis, fracture and burn.

This was followed by an open group discussion regarding any problem facing them and allowing them to discuss.

Stage II: To clarify the impact of the intervention program, it was evaluated three months later by asking the participants the same questions used in the pre-intervention questionnaire.

The statistical manipulation was done using SPSS package, Mc. Namar's test was used for evaluation or the health education regarding the pre and post intervention [11].

RESULTS

Socio demo graphic characteristics of the study sample were presented in Table 1, the mean age of the sample (31 ± 5) (25-36 years) and most of the studied group (41%) with age was between 30-35 years. it was noticed from the table, the majority of the studied group (50%) with experience more than 11 years. As regards the health knowledge the majority of the studied group (32%), had heard about the health knowledge from social media followed by (27%) during their academic education study.

Table (2) showed the impact of Educational session on Kindergarten teachers' about nutrition knowledge and effectiveness of an intervention education program. A significant increase in overall knowledge was detected among them after attending health education sessions. The kindergarten teachers' became much aware about the essential of breakfast meal for children (90%), the danger of fast food (88%), manifestation of malnutrition (94%), the causes and prevention of obesity (89%), canned food contains harmful preservatives (82%). A highly significance difference was found between pre-test and posttest results in relation to most items of kindergarten teachers knowledge about nutrition ($p < 0.01$)

Table (3) showed the impact of Educational session on Kindergarten teachers' about infectious diseases knowledge. The result of the pre-test of our study showed that high percentage of kindergarten teachers had insufficient of knowledge about infectious diseases and showed that the kindergarten teachers' became much aware about the knowledge of infectious diseases, awareness about communicable diseases (93%), mumps is a disease that gives immunity after it's infection (85%), influenza can be transmitted from patient's belongings (94%), awareness of the ways of spreading of the diseases and their prevention is important (94%) and the relation between poor hygiene and transmission of infectious diseases (89%). A highly significance difference was found between pre-test and posttest results in relation to most items of kindergarten teachers knowledge about infectious diseases ($p < 0.01$)

Table (4) showed the impact of Educational session on Kindergarten teachers' about first aid knowledge and effectiveness of an intervention education program. The result of the pre-test of our study showed that high

Table 1: Characteristics of Kindergarten Teachers

Character	Studied Group	
	No	160%
*Age	25-36	
*Mean age ± S.D	(31±5)	
*Age (years)		
25 -	43	27%
30 -	66	41%
35+	51	32%
*Qualification		
Diploma	70	44%
BSC	90	56%
*Experience (years)		
1-5 years	23	14%
6-10 years	57	36%
11+years	80	50%
Source of health information:		
Social media	51	32%
Academic education	43	27%
Television	35	22%
Friends	31	19%
*training of first aids		
Yes	40	25%
No	120	75%

Table 2: Impact of Educational Session on Kindergarten Teachers' Knowledge about Nutrition

Pre-test	Post-test				Total	P
	Yes		NO			
	N0	(%)	No	(%)		
Nutrition's Knowledge						
Breakfast is essential meal for children	41	(92)	4	(8)	45	
Do not Know	103	(90)	12	(10)	115	p<0.01
Know the danger of fast food	36	(98)	4	(11)	40	
Do not Know	106	(88)	14	(12)	120	p<0.01
Know a manifestation of malnutrition	39	(93)	3	(7)	42	
Do not Know	111	(94)	7	(6)	118	p<0.01
Know the causes and prevention of obesity	39	(93)	3	(7)	42	
Do not Know	93	(89)	12	(11)	105	p<0.01
Know canned food contains harmful preservatives	48	(88)	7	(12)	55	
Do not Know	99	(82)	22	(18)	121	p<0.01

Table 3: Impact of Educational Session on Kindergarten Teachers' Knowledge about Infectious Diseases

Pre-test	Post-test				Total	P
	Yes		NO			
	N0	(%)	No	(%)		
Infectious diseases' Knowledge						
Know awareness about communicable diseases	59	(91)	6	(9)	65	
Do not Know	88	(93)	7	(7)	95	p<0.01
Know mumps is a disease that gives immunity after it's infection	51	(85)	9	(15)	60	
Do not Know	85	(85)	15	(15)	100	p<0.01
Know influenza can be transmitted from patient's belongings	38	(91)	4	(9)	42	
Do not Know	111	(94)	7	(6)	118	p<0.01
Know awareness of the ways of spreading of the diseases and their prevention is important	39	(93)	3	(7)	42	
Do not Know	111	(94)	7	(6)	118	p<0.01
Know the relation between poor hygiene and transmission of infectious diseases	48	(88)	7	(12)	55	
Do not Know	93	(89)	12	(11)	105	p<0.01

Table 4: Impact of Educational Session on Kindergarten Teachers' Knowledge about First Aid

Pre-test	Post-test				Total	P
	Yes		NO			
	N0	(%)	No	(%)		
First aid's Knowledge						
Know alcohol is used to treat minor wounds	42	(84)	8	(16)	50	
Do not Know	98	(89)	12	(11)	110	p<0.01
Know first aid of wound	36	(98)	4	(11)	40	
Do not Know	106	(88)	14	(12)	120	p<0.01
Know first aid of epistaxis.	42	(84)	8	(16)	50	
Do not Know	98	(89)	12	(11)	110	p<0.01
Know first aid of fracture	59	(91)	6	(9)	65	
Do not Know	88	(93)	7	(7)	95	p<0.01
Know first aid of burn	41	(92)	4	(8)	45	
Do not Know	103	(90)	12	(10)	115	p<0.01

Table 5: Impact of Educational Session on Kindergarten Teachers' Attitude Towards Nutrition, Infectious Diseases and First Aid

Pre-test	Post-test				Total	P value
	Yes		NO			
	N0	(%)	No	(%)		
Kindergarten teachers' attitude towards, nutrition, infectious diseases and first aid						
Positive attitude	41	(98)	1	(2)	42	
Negative attitude	114	(97)	4	(3)	118	p<0.001

percentage of kindergarten teachers had insufficient of knowledge about first aid. A significant increase in overall knowledge was detected among them after attending health education sessions. The table showed that the kindergarten teachers' became much aware about the knowledge of first aid, alcohol is used to treat minor wound (89%), first aid of wound (88%), epistaxis (89%), fracture (93%) and burn (90%). A highly significance difference was found between pre-test and posttest results in relation to most items of kindergarten teachers knowledge about first aid (p<0.01)

Table (5) showed impact of educational session on kindergarten teachers' attitude towards nutrition, infectious diseases and first aid. As a result of the educational session on Kindergarten teachers' attitude towards nutrition, infectious diseases and first aid has positively increased to 97% (p<0.001).

DISCUSSION

Insufficient health knowledge is associated with poor health status and increased rates of morbidity and mortality. The time spent in kindergarten is an essential period for children to develop healthy behaviors and habits in the future. Therefore, preschool teachers, as important leaders, have a significant impact on the health knowledge and behaviors of preschool children. [12, 13].

The purpose of our study was to explore the extent of kindergarten teachers' knowledge and evaluate the effectiveness of an intervention education program delivered to a group of female kindergarten teachers. The result of the pre-test of our study showed that high percentage of kindergarten teachers had insufficient of knowledge about nutrition, infectious diseases and first aid. A significant increase in overall knowledge was detected among them after attending health education sessions. A highly significance difference was found between pre-test and posttest results in relation to most items of kindergarten teachers knowledge about nutrition, infectious diseases and first aid, This lack of kindergarten teachers knowledge may be attributed to deficiency basic information during their academic education.

As regards the knowledge about nutrition, our study revealed that high percentage of kindergarten teachers had insufficient of knowledge about nutrition and significant increase in overall knowledge was detected among them after attending health education sessions, (Table 2) this finding is similar to results reported by Salah Eldin. S., 2015 [14] that conducted cross sectional study, in Shebin El-kom City Menofia Egypt at Private and Governmental kindergarten, include 15 kindergarten teachers and 240 children aged 3-6 years. Three tools were used for teachers' knowledge related to healthy nutrition. It showed that highly statistical significant improvements

in teachers' knowledge and practice post educational nutritional guideline at ($p < 0.01$). It was concluded that nutritional guideline improve kindergarten teachers' knowledge and practices where positively effect on physical growth of the preschool child as it could prevent childhood malnutrition and promote healthy physical growth.

In addition, Several studies have shown that knowledge of nutrition has increased after nutrition education programs for preschoolers [15, 16].

Man Queenie., 2008 [17] found that preschool children's preferences could be increased when foods were used as rewards also found that familiarity with foods was the most important factor in food preferences of three-year-olds [18]. Preschool can be a critical factor in impacting children's food habits [19].

Our results agreed with the study of De Craemer M *et al.*, 2018 And Liu H *et al.*, 2018 who found that preschool teachers who participated in the survey had poor cognition of children's health knowledge. Adequate health knowledge, the preschool teachers is needed to be able to provide effective support for the development of healthy behavior for children. And it is essential to explore how to increase the health knowledge of preschool teachers. Knowledge is a critical actor in simulating behavioral change. [20, 21].

Also (Charlton., 2012) [7] who reported that the teachers play a fundamental role in giving health education to provide their students with skills for disease-free living and having healthy diet. School children Education about proper nutrition is very important. If their food lacks the needed number of calories, it could lead to malnutrition. On the other hand, excessive eating may lead to overweight and obesity. However, if preschool teachers lack sufficient nutrition background, they cannot provide support to effective prevention plans targeted at childhood obesity [22]. On other hand, the survey of (Hu., *et al.* 2020) found that most preschool teachers did not allow children to bring snacks into the kindergarten, which reflects the presence of some understanding of childhood obesity prevention [23].

Hu *et al.* 2009 reported that Kindergarten-based nutrition education improved preschoolers' lifestyle behaviors through a prospective cohort study to evaluate the impact of nutrition education in kindergartens and to promote healthy dietary habits in children. The results revealed the prevalence of children's unhealthy diet-related behaviors decreased significantly and good lifestyle behaviors increased in the group receiving nutrition education compared with the control group [24].

Furthermore, these results agree with the study of Perez 2001 and Howerton., 2007 who reported that nutrition has a major impact on the early development of morphology and function. Proper nutrition can promote children's physical development and learning abilities [15, 16]. Childhood is gradually being recognized as the critical period during which eating habits and behaviors are established. Kindergarten-based education is a well-known method for implementing nutrition intervention for preschoolers [21].

This is also consistent with the study of Hongyan Liu *et al.*, 2018, that aimed to assess the nutrition-related knowledge, attitudes and practices (KAP) of kindergarten teachers in Chongqing, China. Thus, a cross-sectional survey was conducted using a structured KAP model questionnaire administered to 222 kindergarten teachers, who were senior teachers from 80 kindergartens in 19 districts and 20 counties in Chongqing. Multiple regression analysis was used to analyze the influential factors. Among the participants, 54.2% were familiar with simple nutrition-related knowledge; only 9.9% of them were satisfied with their knowledge of childhood nutrition; and 97.7% of them had a positive attitude to learn nutrition-related knowledge. Only 38.7% of the participants had attended pediatric nutrition knowledge courses or training. Although there were low levels of nutrition knowledge and training, there was positive attitude towards gaining nutrition-related knowledge among kindergarten teachers in Chongqing, China. These findings indicate that necessary training measures need to be conducted to improve the nutrition-related knowledge level among kindergarten teachers in China [25].

Our results found that most Kindergarten teachers had insufficient of knowledge about causes and prevention of obesity and the manifestation of malnutrition this is supported by (Hongmei Hu., 2020) who reported that the awareness of preschool teachers regarding the major causes of obesity in children was only 23%, 37. This reflects that preschool teachers lack health information details regarding childhood obesity [23].

On the other hand, the current study results disagree with (ELMarsomy, 2019) [26] who conducted a study in Baghdad to assess health awareness of kindergarten (KG) teachers and concluded that the participant teachers were of high degree of health awareness due to their previous academic experience and general culture.

This is consistent with other studies that have found changes in knowledge following education [27]. The classroom-based health promotion intervention for

kindergarten and pre-kindergarten students in a rural region of the southeastern United States produced significant improvements in knowledge about nutrition and physical activity. These findings suggest the curriculum could be implemented with success in other kindergarten and pre-kindergarten classrooms in this region.

Previous studies demonstrated that a lack of nutrition knowledge among teachers and staff are common in the kindergartens. Nutrition-related knowledge among teaching staff in the US found that only 3.0% of teachers correctly answered at least four questions on nutrition knowledge and 18.0% correctly answered at least three (all five nutrition questions on the survey). Results of participants with low scores on were likely to lack nutrient elements-related knowledge in most of the nutrition knowledge domains [28].

The research of Hongmei., 2020 was carried out to explore the health knowledge mastery of preschool teachers in Chongqing. A cross-sectional questionnaire survey of preschool teachers in Chongqing was conducted by random sampling. A total of 399 preschool teachers were included in the study. Multiple linear regression analysis was done to explore the influencing factors on preschool teachers' mastery of preschool child health knowledge. This research found that the average score of preschool teacher's knowledge of preschool children was only 34.01 ± 0.78 and concluded that the preschool teachers in Chongqing had a poor grasp of knowledge regarding preschool children's health [25].

As regards knowledge about infectious diseases our study revealed that high percentage of kindergarten teachers had insufficient of knowledge about infectious diseases and significant increase in knowledge was detected among them after attending health education sessions, this is agreement with study of Mabood *et al.*, 2020 (8) whose objectives were to assess the knowledge and attitude of school teachers about nutrition and infectious diseases and to compare the knowledge among government and private school teachers. Data was collected by means of an interview-based questionnaire; this cross-sectional descriptive study carried out at different schools of district Abbottabad. The overall knowledge of schoolteachers was not good enough. The study concluded that the knowledge of government teachers was greater than those of private sector schools. The study concluded that the knowledge of most of teachers about nutrition and infectious diseases is not adequate despite high qualifications schoolteachers. They recommend that child health should be added to the school curriculum.

Grossman., 2012 reported that Schools are perfect places for the spread of infectious diseases due to the large number of young people in contact with each other, some of them may not have developed good personal habits or immunity to various diseases. Transmission of various bacterial, viral and parasitic infections are particularly common in early child care settings where spread can be through the nose, mouth and feces, droplets landing in the air, on surfaces and by direct contact [28].

Our study showed that high percentage of kindergarten teachers had insufficient of knowledge about the relation between bad hygiene and transmission of infectious diseases, this is agreement with study of Grossman., 2012 who reported that children in preschool education exhibit a two to three times greater risk of acquiring infections, which impacts both on individual health and on the community health.

Simple preventative and control measures are effective for reducing transmission of diseases at daycare centers. Some of the recommended measures include: appropriate hand washing after exposure; application of standard precautions; standardized routines for changing and disposal of used diapers, location and cleanliness of changing area, cleaning and disinfection of contaminated areas; use of disposable tissues for blowing noses; separate workers and area for handling foods; notification of infectious diseases; training of workers and guidance for parents [28].

Maria., 2007 reported that we can control the spread of many infectious diseases by giving proper knowledge and training to teachers. Knowledgeable teachers should be able to detect a disease in any of their students in the very early phase of infection. the teacher's role is important in saving other children from acquiring diseases [29].

A similar study shows that 66% of the teachers heard about infections, 68% knew about different modes of transmission of communicable diseases and most of them were knowledgeable about environmental factors influencing the transmission of infectious diseases [30].

A study of Guerriero, 2013 showed that the teachers' knowledge level improved surprisingly to 18% from previously 11% [31].

Ewelina Kurowicka., 2019. who conducted research with the purpose of showing the essence of health education in kindergarten concluded that an important task of parents and kindergarten teachers is to develop healthy eating habits and to support sports activities. During the daily school classes, teachers can provide health education in kindergarten. The study highlighted

the important role of the teacher as a health educator among preschool children [31].

The health education should teach children how to use hygienic procedures, washing hands before meals and after leaving the toilet. Schools can organize competitions to encourage children about healthy behaviors [33].

As regards knowledge about the first aid, our study revealed that high percentage of kindergarten teachers had insufficient of knowledge about first aids and showed significant increase in knowledge among them after attending health education sessions, this is agreement with study of Emmanuel Obeng-Gyasi., 2018 who concluded that Kindergartens teacher should be well trained on first aid and emergency control to save children lives [33].

Furthermore, our study results are in agreement with study of Walelign Anmut., 2017 who carried out a cross-sectional study in Jimma town from 2017. Upon a total of 152 participants, The results of this study showed that there was poor knowledge, negative attitude and poor practice of first aid of the teachers. Only 44% were knowledgeable and 34.8% have positive attitude towards first aid.

Injury is the leading cause of death in 1-14-year-old in several countries and one in five injuries happens at schools. Therefore, children, are essential target population that needs first aid interventions. It is important to create awareness about first aid, its importance and application [34].

Our results are in agreement with study of Damjan Slabea and Rok Finka., 2012 who conducted a study upon 487 randomly selected kindergarten teachers and assistants. The results showed that teachers and assistants are familiar with the responsibilities related to first aid. In the case of burns, bruises and fractures, they would act correctly, but in case of life threatening situations, as cardiopulmonary resuscitation, intoxication, unconsciousness and asphyxia, less than 20% would properly provide first aid [35].

Our study results were also supported by Ali Abdella., 2015 who reported that the kindergarten teachers have a crucial role in child care, supervision, prevention and control of health hazards [36].

CONCLUSION

The health education intervention upon kindergarten teachers revealed significant improvement of knowledge and practice of the studied group in the post and follow up intervention in comparison to pre intervention.

Additionally, the knowledge mean and SD for pre, post and follow intervention were 22.2 ± 5.0 , 35.7 ± 4.7 and 33.3 ± 5.3 respectively. Also, the total practice was improved in post and follow up intervention compared to pre intervention as cleared by mean and SD of 17.4 ± 6.6 , 16.1 ± 7.8 and 9.2 ± 5.1 respectively.

Teaching in kindergarten requires a high level of first aid knowledge both because teachers are often faced with emergency situations and because teachers or assistants are the first to respond in most situations in which an injured child needs help, those teachers should be well trained on first aid and emergency control to save children lives.

Recommendation: Further efforts are needed to improve the knowledge of school teachers through future research.

REFERENCES

1. International Union of Health Promotion Education 2009. Achieving health promoting schools: guidelines for promoting health in schools. IUHPE France.
2. St Leger, L., I. Young, C. Blanchard and M. Perry, 2009. Promoting health in schools from evidence to action. International Union for Health Promotion and Education.
3. Cottrell, R., J. Girvan and J. McKenzie, 2011. Principles and foundations of health promotion and education, 5th edition. California: Benjamin-Cummings.
4. New Jersey Kindergarten Implementation Guidelines, 2011. Available at: <http://www.nj.gov>
5. Jourdan, D., J. Pironom, C. Simar and M. Sormunen, 2018. Health education in schools: Factors influencing parents' views of the home-school relationship in France. International Journal of Health Promotion and Education, 56(1): 32-50.
6. Moestue, H., S.R. Huttly, L. Sarella and S. Galab, 2007. The bigger the better?: mothers' social networks and child nutrition in andhra pradesh. Public Health Nutr., 10(11): 1274-82.
7. Charlton, A., 2012. Health education and the teacher's role. Int. J. Heal. Educ., pp: 24.
8. Fazal Mabood, Muhammad Siqaf Anjum, Abdul Haseeb, Muhammad Shoaib, Aiman Usman Lodhi and Faiqa Ghani, 2020. Knowledge of School Teachers about Infectious Diseases and the Nutritional Status of Children in Schools of Abbottabad. Merit Research Journal of Medicine and Medical Sciences (ISSN: 2354-323X), 8(11): 679-689.

9. Oliveira, I.S., I.P. Souza, S.M. Marques and A.F. Cruz, 2014. Knowledge of educators on prevention of accidents in childhood. *J. Nurs. UFPE*.
10. Muneeswari, B., 2014. A study to assess the effectiveness of planned health teaching program using child-to-child approach on knowledge of selected first aid measures among school children in selected schools at Dharapuram in Tamil Nadu, India, Vol. 3, issue 1, *GLOBAL JOURNAL OF MEDICINE AND PUBLIC HEALTH*
11. Armitage, P. and Berry, 1985. Comparison of Two proportions in statistical methods in medical research. 7th edition. Redwood Burn Limited. Trowbridge Wiltshire. Blackwell Scientific Publications, pp: 120-124.
12. Slabe, D., R. Fink, E. Dolenc and Kvas, 2016. Knowledge of health principles among professionals in Slovenian kindergartens. *Slovenian J Public Health*, 55(3): 185-194. doi:10.1515/sjph-2016-0024
13. Ganfure, G., G. Ameya and A. Tamirat, 2018. First aid knowledge, attitude, practice and associated factors among kindergarten teachers of Lideta sub-city Addis Ababa, Ethiopia. *PLoS One.*; 13(3): e0194263. doi:10.1371/journal.pone.0194263.
14. Salah Eldin, S., 2015. Effect of Nutritional Guideline for Kindergarten Teachers on Healthy Physical Growth of Preschool Children. *IOSR Journal of Research & Method in Education (IOSR-JRME)* e-ISSN: 2320-7388, p-ISSN: 2320-737X Volume 5, Issue 4 Ver. I
15. Perez-Rodrigo, C. and J. Aranceta, 2001. School-based nutrition education: lessons learned and new perspectives. *Public Health Nutr.*, 4: 131-139.
16. Howerton, M.W., B.S. Bell, K.W. Dodd, D. Berrigan, R. Stolzenberg-Solomon and L. Nebeling, 2007. School-based nutrition programs produced a moderate increase in fruit and vegetable consumption: meta and pooling analyses from 7 studies. *J. Nutr. Educ. Behav.*, 39: 186-196.
17. Man Queenie, P., 2008. A case study on the implementation of the project approach in two kindergartens in Hong Kong. Unpublished master thesis, University of Hong Kong.
18. Darnton-Hill, I, E. Kennedy, B. Cogill and S.M. Hossain, 2006. Solutions to nutrition-related health problems of preschool children: education and nutritional policies for children. *J. Pediatr Gastroenterol Nutr.* 43(3): S54-S65.
19. Ghoneim, E.H., M.H. Hassan and E.K. Amine, 2004. An intervention programme for improving the nutritional status of children aged 2-5 years in Alexandria. *East Mediterr Health J.*, 10: 828-843.
20. De Craemer, M., M. Verloigne and A. Ghekiere, 2018. Changes in children's television and computer time according to parental education, parental income and ethnicity: a 6-year longitudinal EYHS study. *PLoS One.*; 13(9): e0203592. doi:10.1371/journal.pone.0203592
21. Liu, H., X. Xu and D. Liu, 2018. Nutrition-related knowledge, attitudes and practices (KAP) among kindergarten teachers in Chongqing, China: a cross-sectional survey. *Int. J. Environ. Res. Public Health*, 15(4): 615. doi:10.3390/ijerph15040615
22. Birch, L.L. and K.K. Davison, 2001. Family environmental factors influencing the developing behavioral controls of food intake and childhood overweight. *Pediatr Clin North Am.*, 48: 893-907.
23. Hongmei Hu, Tingting Wu, Luying Fan Keying Zuo, Ling Chen, Jiaqiong Zhang and Xin Zhao, 2020. Knowledge of Child Health and Affecting Factors Among Preschool Teachers: A Cross-Sectional Study in Chongqing, China. *Risk Management and Healthcare Policy*, 2020: 13 2515-2524.
24. Chuanlai Hu, Dongqing Ye, Yingchun Li, Yongling Huang, Li Li, Yongqing Gao and Sufang Wang, 2009. Evaluation of a kindergarten-based nutrition education intervention for pre-school children in China. *Public Health Nutrition*, 13(2): 253-260.
25. Hongyan Liu, Xianglong Xu, Dengyuan Liu, Yunshuang Rao, Cesar Reis, Manoj Sharma, Jun Yuan, Yao Chen and Yong Zhao, 2018. Nutrition-Related Knowledge, Attitudes and Practices (KAP) among Kindergarten Teachers in Chongqing, China: A Cross-Sectional Survey *Int. J. Environ. Res. Public Health*, 15(4): 615.
26. Marsomy yousif karim Lila, 2019. Health Awareness in Kindergarten Teachers *journal of the college of basic education*, Volume 2, Issue 2 / Pages 380-400
27. Holli H. Seitz Julie C. Parker Heather L. Hanna Ginger C. Hooge, 2021. Evaluation of a Health Education Intervention for Rural Preschool and Kindergarten Children in the Southeastern United States: A Cluster Randomized Trial. *Journal of human sciences & Extension.*, 9(1).
28. Sharma, S., K.S. Dortch, C. Byrd-Williams, J.B. Truxillio, G.A. Rahman, P. Bonsu and D. Hoelscher, 2013. Nutrition-related knowledge, attitudes and dietary behaviors among head start teachers in Texas: A cross-sectional study. *J. Acad. Nutr. Diet.*, 113: 558-562.
29. Grossman, L.B., 2012. *Infection Control in the Child Care Center and Preschool*; Demos Medical Publishing: New York, NY, USA.

30. Maria M.M. Nesti and Moisés Goldbaum, 2007. Infectious diseases and daycare and preschool education *Jornal de Pediatria*, 83(4).
31. Guerriero, S., 2013. Teachers' Pedagogical Knowledge and the Teaching Profession: Background Report and Project Objectives.
32. Ewelina Kurowicka Kurowicka Ewelina, 2019. Health education and health promotion among preschool children. *Journal of Education, Health and Sport*, 9(7): 497-506. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.3407784>
33. Emmanuel Obeng-Gyasi, Melissa A. Weinstein, Jessica R. Hauser and Cecilia S. Obeng, 2018. Teachers' Strategies in Combating Diseases in Preschools' Environments, *Children*, 5: 117; doi:10.3390/children5090117.www.mdpi.com/journal/children
34. Walelign Anmut, Molalegn Mesele and Tiwabwork Tekalig, 2017. Knowledge, Attitude and Practice Towards First Aid Among Kindergarten Teachers of Jimma Town, South West, Ethiopia, *Journal of Emergency Medicine and Primary Care* Volume 2019, Issue 01 Research Article: RD-EMP-10008
35. Damjan Slabea and Rok Finka, 2012. Kindergarten teachers' and their assistants' knowledge of first aid in Slovenian kindergartens. *Health Education Journal*, 72(4): 398-407.
36. Nabila Hassan Ali Abdella, Nagwa Rizk Mohammed Abu-Elenen, Rehab Hani Elkazaz and Maha Moussa Mohamed Moussa, 2015. Intervention program for the kindergarten teachers about pediatrics first aids, *American Journal of Research Communication*, 3(5): 178-194.