Research Article

Evaluation of structural educational program related to environmental context on kindergarten teachers' knowledge

Mohammed Hassan Aloda[1] and Sahar Adham Ali[2,*]

[1]*Pediatric Nursing Department, College of Nursing, University of Babylon, Iraq*
[2]*Adult Nursing Department, College of Nursing, University of Babylon, Iraq*

Sahar Adham Ali (nur.sahar.adham@uobabylon.edu.iq)

Abstract

Background: Early childhood is a pivotal stage in human life, during which the basic foundations for physical, mental, social, and emotional development are formed. Knowledge of the kindergarten's environmental context is a crucial factor in promoting learning and growth. This context includes several elements, such as ensuring physical safety, providing adequate spaces for movement and activity, appropriate furnishings and educational tools, the availability of stimulating toys and educational aids, and adequate ventilation and lighting to ensure a healthy and comfortable environment. **Objectives:** This study directed to evaluate the environmental context educational program on kindergarten teach-ers' knowledge. **Method:** A quasi-experimental design was employed among 50 kindergarten teachers in nine kindergartens in in holy city of Karbala. The study instrument consists of demographic and employment information, and the environmental context questionnaire consisting of 26 multiple choices questions. **Results:** The majority of kindergarten teachers were between 35 and 44 years old (mean = 36.82, standard deviation = 7.5), had a bachelor's degree or higher, and at least five years of experience. Pre-test results indicated that teachers' knowledge of and environmental context was fair. The educational program demonstrated statistically significant effectiveness in improving knowledge. Teachers' knowledge related to environmental context was strongly associated with the teachers education of qualification, age, and years of experience, extended to the type of kindergarten, while child responsibility showed no statistically significant relationship. **Conclusion:** Kindergarten teachers' basic knowledge of environmental context was insufficient, but the designed educational program effectively enhanced this knowledge. Educational level, professional experience, were critical factors in determining knowledge, highlighting the importance of structured professional environment context. **Recommendations:** Creating a healthy environmental context acts as a vital element to maintain the health status of children who attend kindergarten regularly. Teachers play an important role as decision-makers and evaluators who control such an environment. For this reason, educational sessions to enhance health content and support children's growth and development are necessary.

Keywords: environmental context, kindergarten teachers, educational program, teacher knowledge, early childhood development

1. Introduction

Cognitive development is greatly influenced by the surrounding environment, including socioeconomic status, family relationships, and cultural background. Teachers can develop culturally responsive teaching strategies, which are crucial in diverse classrooms, supported by educational programs that incorporate environmental awareness [1]. Through a comprehensive understanding of environmental influences, teachers can adapt their pedagogical approaches and create a supportive learning environment that respects and supports each child's individual developmental path [2]. Florence Nightingale's environmental theory was initially developed in the context of nursing, it provides insightful information for early childhood education. She emphasized how physical environments, such as light, cleanliness, ventilation, and noise, influence healing and well-being. By ensuring safe, clean, well-lit, and quiet classrooms, these ideas can be adapted for use in educational settings to promote cognitive, emotional, and psychomotor development. Educators who recognize the impact of the environment on learning can design the best possible learning environments that support student engagement and well-being [3, 4]. Environmental context teaching programs have been crucial in enhancing kindergarten teachers' understanding. These programs emphasize the importance of the teaching and

learning environment, which consists of many aspects such as physical spaces and their characteristics, as well as socio-cultural elements that can be integrated to enhance children's development. Teachers' instructional strategies and children's engagement significantly improve when they receive training on how to create and manage supportive learn-ing environments [5]. Professional development programs that integrate developmental theories and environmental context have been shown to improve teachers' knowledge. Teachers who receive this comprehensive training gain a broad understanding of child development and the variables that influence learning. According to research, teachers who receive comprehensive training have greater motivation, self-confidence, and flexibility in diverse educational settings [6]. A holistic approach to teaching is ensured by integrating developmental stages and environmental context into early childhood education programs. This comprehensive knowledge enables teachers to promote the best possible cognitive development in their students, ultimately improving their academic and social outcomes [7]. Thus, a focus on culturally and developmentally relevant education has emerged as a common practice in early childhood education.

2 Methodology

2.1 Design of the study

One group quasi-experimental design method carried out through pre and posttest to achieve the related objectives.

2.2 Setting of the study

The study was carried out at the Kindergartens in the center of the holy Karbala city:

Table 1: Distribution of the Setting Centers

Kindergarten name	*Type*	*Establishment Date*
Al-Qutoof Al-Daniya Kindergarten	Private	2022
Al-Khwarizmi Kindergarten	Private	2018
Al-Misbah Al-Sehri Kindergarten	Private	2016
Al-Sindbad Kindergarten	Governmental	2014
Montessori Kindergarten	Private	2024
Al-Areej Kindergarten	Governmental	2012
Al-Imtiaz Kindergarten	Private	2017
Al-Mubdi' Al-Sagheer Kindergarten	Private	2021
Ard Al-Sukkar Kindergarten	Private	2020

2.3 Tool of the study

To evaluate the" effectiveness of environmental context educational program for early childhood on the knowledge of kindergarten teachers, study questionnaire based on the review of the relevant literature and previous study were prepared. The study questionnaire consists of two parts:

Part one: Demographic and employment characteristics of the kindergartens teachers who participate in the present study consist of (age, educational, years of experience in kindergarten, responsibility on child at home). *Part two: The environmental context questionnaire* was consist from 26 items with multiple choices questions and the rating system which adopted distributed between correct and incorrect answers, which the scoring value of responses were depend upon two likert scale two for correct answer and one for incorrect. The total scoring range located between (26 to 52), with higher scores indicating good knowledge.

2.4 Sample of the study

In order to represent the research sample, Non–probability purposive sample from use to select 50 teachers at kindergarten teacher in holly Karbala city.

2.5 Validity

The questionnaires assessed by who have over ten years of experience in the specialty field. Content validity was statistical calculator, the results was 0.97 which is acceptable.

2.6 Ethical Consideration

Ethical issues and considerations to ensure participants' privacy, and autonomy. Participation was voluntary from the teachers, and the participants informed that their data would be confidential used only for study purpose.

2.7 Data Collection

To achieve the objectives of this study data were collect from fifty teachers distributed on nine kindergarten located on holly Karbala city. Self-report method selected to complete the prepared questionnaire. The data collection collected started on 12th June 2025 by carried out pre-test the results indicated that all the participants shows unsatisfied level of knowledge related to prepare environmental context. The presentation of educational sessions started from 22th June 2025 to 30th June 2025 through small groups, after completing the session the first post-test carried out, the second post- test obtained from the 50 teachers. Data collection completes in 23th July 2025 which take about 40 days.

3 Results and Discussion

Table 2 presents the distribution of the participants according to their socio-demographic and employment characteristics, including age group and level of qualification. Figure 1 shows the percentage distribution of years of experience among kindergarten teachers. The figure indicates that most of the participants had less than five years of teaching experience. Figure 2 presents the percentage of participants who had responsibilities for maintaining care of their children at home. Figure 3 shows the percentage distribution of the type of kindergarten in which the teachers were working. Table 3 determines the effectiveness of the prepared educational program regarding early childhood environmental context on teachers' knowledge across the pretest, first posttest, and second posttest. Table 4 presents the level of kindergarten teachers' knowledge regarding the early childhood environmental context across the three tests. Table 5 shows the relationship between kindergarten teachers' knowledge regarding the early childhood environmental context and their demographic and employment variables.

Data	*Subgroup*	*f.*	*%*
Age group	Young adults (18–24 years)	4	8.0
	Adults (25–34 years)	15	30.0
	Middle-aged adults (35–44 years)	23	46.0
	Early middle-aged adults (45–54 years)	8	16.0
	Total	50	100.0
	Min–Max	18 y–54 y	
	Mean ± SD	36.82 ± 8.76	

Level of qualification	Secondary school	9	18.0
	Diploma degree	15	30.0
	Bachelor's degree or above	26	52.0
	Total	50	100.0

f = frequency, % = percentage, M = mean score, SD = standard deviation.

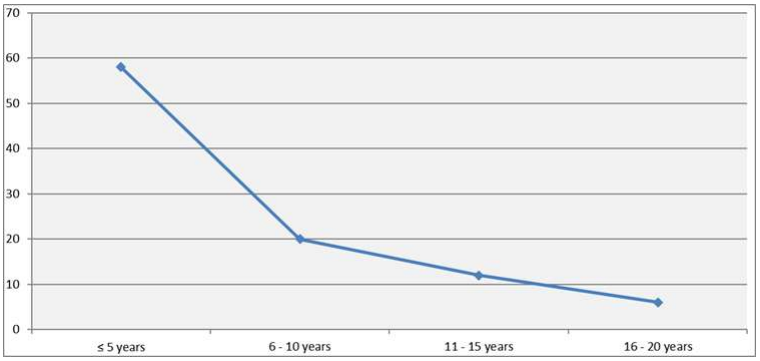

Figure 1: Percentage distribution of years of experience among kindergarten teachers, showing that most participants had less than five years of experience

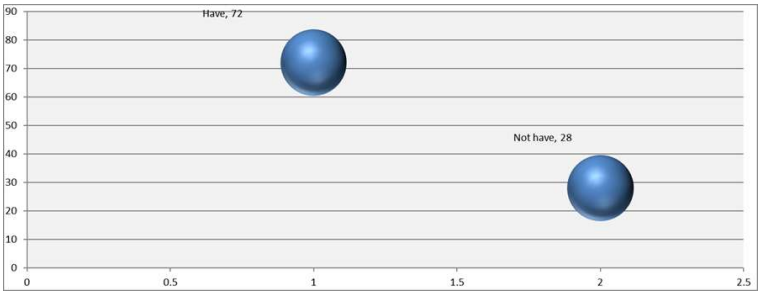

Figure 2: Percentage of participants who had responsibilities for maintaining care of their children at home

Figure 3: Percentage distribution of the type of kindergarten as the working area

Table 3: Effectiveness of the prepared educational program regarding early childhood environmental context on teachers' knowledge

Domain	Items N	Pretest			Posttest 1			Posttest 2			Friedman Test			
		Mean	SD	Ass.	Mean	SD	Ass.	Mean	SD	Ass.	C.S	W	df	Sig.
Space and	1.	1.50	0.505	F	1.80	0.404	G	1.78	0.418	G				
	2.	1.32	0.471	P	1.88	0.328	G	1.84	0.370	G				
	3.	1.38	0.490	F	1.86	0.351	G	1.82	0.388	G				

Furnishings	4.	1.48	0.505	F	1.96	0.198	G	1.94	0.240	G				
	5.	1.48	0.505	F	1.72	0.454	G	1.70	0.463	G				
	Total	1.43	0.301	F	1.84	0.195	G	1.82	0.205	G	80.9	0.810	2	0.000
Personal Care Routines	6.	1.44	0.501	F	1.78	0.418	G	1.76	0.431	G				
	7.	1.58	0.499	P	1.92	0.274	G	1.92	0.274	G				
	8.	1.42	0.499	P	1.92	0.274	G	1.88	0.328	G				
	9.	1.38	0.490	F	1.84	0.370	G	1.80	0.404	G				
	10.	1.40	0.495	F	1.90	0.303	G	1.86	0.351	G				
	Total	1.44	0.326	F	1.87	0.209	G	1.84	0.215	G	69.8	0.698	2	0.000
Language and Reasoning	11.	1.64	0.485	F	1.80	0.404	G	1.76	0.431	G				
	12.	1.58	0.499	F	1.76	0.431	G	1.74	0.443	G				
	13.	1.34	0.479	F	1.88	0.328	G	1.86	0.351	G				
	Total	1.52	0.376	F	1.81	0.262	G	1.79	0.292	G	31.0	0.310	2	0.000
Activities	14.	1.34	0.479	F	1.88	0.328	G	1.86	0.351	G				
	15.	1.56	0.501	F	1.90	0.303	G	1.88	0.328	G				
	16.	1.46	0.503	F	1.92	0.274	G	1.90	0.303	G				
	17.	1.62	0.490	F	1.90	0.303	G	1.88	0.328	G				
	Total	1.49	0.337	F	1.90	0.226	G	1.88	0.233	G	70.8	0.708	2	0.000
Interaction	18.	1.44	0.501	F	1.92	0.274	G	1.90	0.303	G				
	19.	1.52	0.505	F	1.80	0.404	G	1.78	0.418	G				
	20.	1.54	0.503	F	1.82	0.388	G	1.80	0.404	G				
	21.	1.58	0.499	F	1.98	0.141	G	1.94	0.240	G				
	Total	1.52	0.327	F	1.88	0.204	G	1.85	0.221	G	56.8	0.568	2	0.000
Program Structure	22.	1.58	0.499	F	1.86	0.351	G	1.82	0.388	G				
	23.	1.60	0.495	F	1.96	0.198	G	1.94	0.240	G				
	24.	1.38	0.490	F	1.82	0.388	G	1.80	0.404	G				
	Total	1.52	0.357	F	1.88	0.210	G	1.85	0.235	G	49.8	0.498	2	0.000
Parents and Staff	25.	1.62	0.490	F	1.90	0.303	G	1.86	0.351	G				
	26.	1.66	0.479	F	1.90	0.303	G	1.88	0.328	G				
	Total	1.64	0.429	F	1.90	0.247	G	1.87	0.264	G	20.7	0.207	2	0.000
Overall Knowledge		1.49	0.135	F	1.87	0.157	G	1.84	0.160	G	94.0	0.941	2	0.000

M = mean score, SD = standard deviation, Assessment = Poor (1–1.33), Fair (1.34–1.66), and Good (1.67–2).
C.S = Chi-square, df = degrees of freedom, W = Kendall's W, P = probability value, NS = non-significant at $P \geq 0.05$.

Level	*Pretest*				*Posttest 1*				*Posttest 2*			
	f.	%	Mean	SD	f.	%	Mean	SD	f.	%	Mean	SD
Poor	8	16.0			0	0			0	0		
Fair	42	84.0			6	12.0			7	14.0		
Good	0	0			44	88.0			43	86.0		
Total	50	100.0	38.84	3.501	50	100.0	48.58	4.081	50	100.0	47.90	4.166

Data	Subgroup	Knowledge		
		Mean Rank	Analysis	P value
Age group	18–24 years	8.38	0.545	0.000
	25–34 years	16.60		
	35–44 years	32.91		
	45–54 years	29.44		
Level of qualification	Secondary school	9.11	15.370	0.000
	Diploma degree	31.67		
	Bachelor's degree or above	27.62		
Years of experience	≤ 5 years	18.31	0.736	0.000
	6–10 years	29.90		
	11–15 years	41.50		
	16–20 years	41.50		
	≥ 21 years	35.75		

Having children at home under care responsibility	Yes	26.29	−0.632	0.528
	No	23.46		
	1–2	30.38		
	3 or more	26.88		
Type of kindergarten	Governmental	34.54	−4.153	0.000
	Private	17.80		

P = probability value, NS = non-significant at P ≥ 0.05*.*

The results in Table 2 show the distribution of age among kindergarten teachers. The majority of the participants were between 35 and 44 years of age, with a mean age of 36.82 years and a standard deviation of 7.5 years. Regarding educational qualification, most participants had a bachelor's degree or above. According to Figure 1, most kindergarten teachers had less than five years of teaching experience. Figure 2 shows that kindergarten teachers had responsibilities for maintaining care of their children at home, while Figure 3 presents the distribution of teachers according to the type of kindergarten in which they worked. The current findings are consistent with a study conducted by [8], which sought to examine the quality of work life of kindergarten teachers in China. That study revealed that the majority of kindergarten teachers had less than five years of experience and held a bachelor's degree or higher. The results are also consistent with a study conducted by [9], which examined the factors predicting career development among Chinese kindergarten teachers. According to that study, most of the teachers had worked for between one and five years. The study also found that the average age of the participants was 31.6 years. As shown in Table 4, the level of kindergarten teachers' knowledge in the pretest regarding the early childhood environmental context was fair, and most participants had fair knowledge. According to the current study, the majority of kindergarten teachers had adequate knowledge of early childhood environmental education. [10] sought to understand Greek kindergarten teachers' perspectives on environmental education and found that, although teachers acknowledged its importance, their understand-ing and implementation of it were deficient. Given that both studies demonstrate modest levels of teacher expertise, this finding is in line with the current results. In another study, [11] investigated how early childhood teachers' practices are influenced by personal and environmental factors and found that teachers' knowledge was influenced by external factors, ranging from acceptable to moderate. This supports the idea that environmental influences may also contribute to knowledge equity, which is consistent with the current study. In a further study, [12] examined the teaching of online environmental education to pre-service teachers using a realist, efficacy-based perspective and found that teachers' implementation and understanding were often equitable, supporting the findings of the current study. The results in Table 3 show that there was statistically significant effectiveness of the prepared educational program regarding the early childhood environmental context on kindergarten teachers' knowledge. The overall knowledge mean score increased from 1.49 in the pretest to 1.87 in the first posttest and remained high at 1.84 in the second posttest. This indicates that the prepared educational program had a clear positive effect on improving teachers' knowledge. A study evaluating a professional development program for kindergarten teachers and studying their pro-fessional development using a mixed methodology sought to analyze improvements in kindergarten teachers' professional development, competencies, and knowledge through the evaluation of a professional development program titled "Improving the Quality of Preschool Environment" for kindergarten teachers in Greece. Pos-itive outcomes were observed: participants reported acquiring new skills and information and using them in their teaching. This is consistent with the results of the current study, which indicate significant effectiveness of the educational program [13]. A recent study examined the effects of a six-week sustainability-focused education program combining inquiry-based and experiential learning on pre-service teachers' ecological footprint, willingness to work, and environmental attitudes. All measured factors, including attitudes, willingness to work, and reduced ecological footprint, showed significant improvements after the intervention [14]. This finding supports the present study, as Table 3 demonstrates clear improvement in kindergarten teachers' knowledge after the educational program. The results in Table 5 show that there were statistically significant differences in kindergarten teachers' knowledge regarding the early childhood environmental context according to their level of education, type of kindergarten, age, and years of experience. Moreover, Table 5 shows that there was a statistically significant positive correlation between kinder-garten teachers' knowledge regarding the

early childhood environmental context and their age and years of experience. However, Table 5 also shows that there was no statistically significant relationship between kindergarten teachers' knowledge regarding the early childhood environmental context and their responsibility for children at home. In a study, [15] investigated the relationship between kindergarten classroom climates and teachers' characteristics, such as educational background. Consistent with the current study's finding that there are significant differences in teachers' knowledge according to educational attainment, the results showed that teachers with higher educational levels tend to create more encouraging and stimulating learning environments in the classroom. In another study, [16] investigated the relationship between kindergarten skills and household food insecurity. Consistent with the current study's findings on the role of educational level, that study highlighted the importance of teacher training in addressing environmental factors that influence child development. In a 2015 study, [17] investigated how teachers' ages influence their understanding of developmental theory. According to the findings, older teachers may have different conceptual environments, which could influence how they perceive environmental situations in early childhood. In a further study, [18] examined the relationship between children's knowledge outcomes and pre-service teachers' professional development. That study supported the current study's conclusion that experience and knowledge of the environmental context are positively related, showing that teachers with more years of experience often demonstrate a stronger awareness of educational environments.

4 Conclusion

This study provides valuable information about kindergarten teachers' understanding of early childhood environmental context. Results showed that most of them had at least a bachelor's degree, were in their mid-thirties, and had limited teaching experience. Despite these limitations, their general background knowledge was average across contextual environments, indicating gaps in basic knowledge. The importance of structured, evidence-based training interventions was confirmed by the implementation of the developed educational program, which achieved notable success in increasing teachers' knowledge. Furthermore, teachers' knowledge of the environment context was also influenced by kindergarten type, age, education level, and years of experience. Overall, the study emphasizes the importance of professional preparation and ongoing training in improving early childhood teachers' knowledge base, which directly impacts their ability to support children's holistic growth and development.

5 Recommendations

Creating a healthy environmental context acts as a vital element to maintain the health status of children who attend kindergarten regularly. Teachers play an important role as decision-makers and evaluators who control such an environment. For this reason, educational sessions to enhance health content and support children's growth and development are necessary.

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