

# Effects of School-Based Interventions Implemented by Nurses for Children Aged 3-6 Years: A Systematic Review of Experimental Evidence

Gökçe ALGÜL<sup>1</sup>, Ebru KILIÇARSLAN<sup>2</sup>

<sup>1</sup> Gazi University Health Research and Application Center, Gazi Hospital Quality Management, Ankara, Türkiye

<sup>2</sup> Gazi University Faculty of Health Sciences, Department of Nursing, Department of Child Health and Diseases Nursing, Ankara, Türkiye

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## Abstract

### Objective

The 3-6 age period, which includes the pre-school, is when the child acquires essential habits, develops skills, and socializes. This systematic review was planned to examine the available evidence on the effectiveness of school-based interventions implemented by nurses and administered to preschool children.

### Material and Method

The systematic review used a search to identify studies published between 2015 and 2024 from PubMed, Medline, Cochrane Library, ProQuest, Science Direct, and Web of Science databases.

### Results

When the findings were examined, fifteen studies, including six randomized controlled trials and nine quasi-experimental studies, met the inclusion criteria. In the studies conducted, it was determined that the duration of the interventions applied only to children was between 2 and 16 sessions, the intervention periods of the studies that included parents along with

children were between 8 and 30 sessions, and only 4 studies used theory or models. It was determined that the programs applied by nurses to children between the ages of 3-6 in the school environment provided children with knowledge and skills and had positive effects on the development of their physical, social, and emotional health.

### Conclusion

Nurses are responsible for increasing children's knowledge and skills in schools and promoting healthy lifestyles. Nurses must collaborate with parents to ensure that children's health education at home and school complement each other. The results of the studies included in the systematic review should be cautiously interpreted due to the limited number of studies and small sample size. To obtain the best evidence on the effectiveness of interventions, randomised controlled trials aiming to improve social and emotional competencies are needed to evaluate comprehensive, high-quality, and long-term effects.

**Keywords:** Child, nursing, pre-school, school-based intervention

**Correspondence:** G.A. / gokcealgul@gazi.edu.tr

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**ORCID IDs of the Authors:** G.A: 0000-0003-0945-2145; E.K: 0000-0002-3358-7616

## Introduction

Children constitute a large proportion of the world's population (1). Protection, development, and maintenance of children's health, who constitute a significant portion of the world population, are among the primary objectives. Children's cognitive, social, emotional, and physical development progresses rapidly, especially in the first six years. Children whose development is supported with awareness in this period contribute to forming healthy generations. In addition, children supported in the desired quality show more development in their future lives. It is known that preschool education creates positive opportunities for children in terms of learning and development. In addition, preschool education institutions have an essential place in protecting and improving the health of young children (2,3). A review of the literature reveals that school-based programs support the cognitive, social, emotional, and physical development of preschool children and increase their well-being (4-7). It was determined that the studies were conducted by professionals such as teachers, psychiatrists, psychologists, social workers, and nurses (8).

The nursing profession encompasses care to protect and promote the health and well-being of individuals of all ages, parents, groups, and communities in all settings and to heal in case of illness (9). Nurses have a vital position to fulfil their roles as researchers, educators, and advocates as part of health promotion activities in schools, hospitals, and all areas where health services are provided. In schools, nurses can carry out interventions to support child development by addressing health holistically (10). In this period, nurses need to implement health-promoting nursing interventions to prepare the child for life in the best way (11). When the literature was examined, no study was found that analyzed experimental and quasi-experimental studies evaluating the effect of school-based interventions implemented by nurse researchers for preschool children. Our systematic review results are thought to shed light on creating nurse-led programs to meet the health needs of preschool children in schools.

The purpose of this systematic review was to evaluate the available data regarding the efficacy of nurse-led school-based treatments for preschoolers. As a result, responses to the following queries were requested:

1. What are the characteristics of the interventions nurses apply to preschool children in the school environment?

2. Which outcomes were measured in the interventions applied by nurses to preschool children in the school environment?

## Material and Method

### Study Design

The methodology for this study was a systematic review. The PROSPERO database has the study protocol registered (CRD42023467297). The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines were adhered to in this systematic study (12).

### Eligibility Criteria for the Study

At the beginning of this study, we established the protocol according to the PICOS (Population, Intervention, Comparison, Outcomes and Study Design) approach. The PICOS approach formed the basis of the inclusion criteria in this study.

#### Inclusion Criteria

-Population: Studies in which the sample comprises healthy children aged 3-6 years or parents with children.

-Intervention: Activities carried out by nurses in the school environment with face-to-face education methods to children or children and their parents through different communication methods.

-Comparison: Studies with or without a control group

-Outcome: Social, emotional, and physical outcomes for children.

-Study type: Quasi-experimental studies and randomized controlled trials (RCTs)

#### Exclusion Criteria

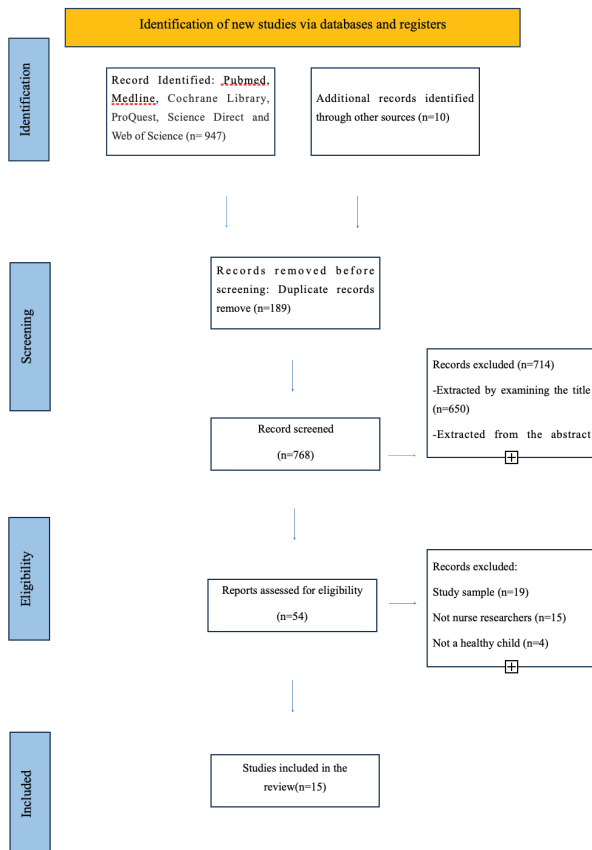
Interventions for children with physical, mental, social, or psychological diagnoses.

Descriptive, cross-sectional, case-control, cohort studies, discontinuous time series, qualitative studies, feasibility studies, cost-effectiveness studies, study protocols, conference proceedings, or abstracts.

### Search Methods

Two researchers independently analyzed research articles published in six databases between January 01, 2015, and July 31, 2024: PubMed, Medline, Cochrane Library, ProQuest, Science Direct, and

Web of Science. Additional records were identified through manual searching. The literature search used a systematic search strategy based on research questions in line with medical subject headings terms and synonymous combinations with topics across all items using Boolean ('AND' and 'OR') operators for each database. The reviews were analyzed from the identified databases using the following search strategy.



**Figure 1:** The Flow diagram of the studies included in the review aligns with the PRISMA

(Child OR children OR kindergarten OR preschool OR pre-school OR nursery) AND (nursing OR 'school nurse' OR 'pediatric nursing') AND ('school based' OR 'school-based' OR 'school healthy') AND (intervention OR program OR programme OR training) AND ('randomis(z)ed Controlled Trial' OR 'controlled clinical trial' OR 'quasi-experimental'). Databases were searched using the English language.

EndNote X9, a reference management program, was used to save the studies obtained from scanning databases to eliminate duplications. The flow chart created in line with the PRISMA 2020 writing guide in the search strategy is given in Fig. 1

### Study Selection and Data Extraction

All search results were imported into Endnote X9, a reference management software for data management. Titles and abstracts were assessed against the inclusion criteria, and two researchers discussed potential ambiguities. All data retrieved and classified as relevant or useful were obtained in full text and thoroughly assessed by two researchers to determine relevance. Inconsistencies were resolved through discussion and consensus between the two researchers.

### Quality Assessment

The listed studies' methodological quality was evaluated separately by two researchers. The methodological quality of the studies was evaluated using the critical assessment instruments developed by the Joanna Briggs Institute (JBI) (13,14). JBI quality evaluation instruments were used to examine the studies' selection, performance, detection, and reduction of biases. The 13-item JBI is used in randomized controlled research. There are four possible responses to a question: "Yes," "No," "Unclear" (if the inquiry does not provide facts about a certain topic), and "Not applicable (NA)" (if the question is not answered). There are four possible scores for each question: one for "Yes," zero for "No," zero for "Unclear," and zero for "Not applicable." The overall result might range from 0 to 13 (13). JBI for quasi-experimental studies consists of 9 questions. Each question is scored as 'Yes' (1 point), 'No' (0 point), 'Unclear' (0 point), or 'Not applicable' (0 point). The total score ranged from 0 to 9 points (14). The high scores obtained from both tools indicate that the research is of methodological quality (13,14). Research with a substantial bias score of less than or equal to 50% of the items under examination were deemed to have low methodological quality. Nahcivan and Seckinli adapted the JBI critical evaluation instruments for experimental and quasi-experimental designs' Turkish validity and reliability for use in quality assessment (15).

## Results

### Characteristics of Studies

A total of 15 studies, including six RCTs (16-21) and nine quasi-experimental studies were included in the study (22-30). The studies were published between 2015 and 2024 and were conducted in the following countries: Turkey, Malawi, China, Egypt, Brazil, Hong Kong, and Spain. The general characteristics of the included studies are summarised in Table 1.

### Risk of Bias within Studies

Table 2 and Table 3 list the studies that were evaluated using the JBI Critical Appraisal Checklist for RCTs and quasi-experimental designs.

**Table 1** Main characteristics of the studies included in the systematic review (n = 15)

Author/ Year/ Country	Study Design	Sample Characteristics	Intervention	Control Group Intervention	Intervention Duration	Instruments	Primary Outcome	Theory/ Model
Bıyıkoglu Alkan et al., 2023/ Turkey	Randomized Controlled Trial T0: Before the start of the intervention T1: After intervention	(N= 65) (IG: 32; CG:33) Children Age: 5-6	Personel Hygiene Program	Standart School Curriculum	5 Sessions	Health Education Scale for Preschool Children (T0 T1) Control List for Children's Oral and Dental Health. (T0 T1)	After the intervention, a significant increase was observed in the scale scores of the intervention group for hand washing and oral dental health compared to the control group.	Bandura's Social Cognitive Theory
Altundağ and Körükçü, 2023/ Turkey	Quasi-Experimental Design T0: Before the start of the intervention T1: After intervention	(N=72) (IG: 36; CG: 36) Children Age: 5-6	Risk Reduction Education to Prevent Home Accidents	Standard School Curriculum	5 Sessions	A Determination of Home Environment Risks Form (T0 T1)	While the difference between the education health score averages of the entry and control groups was not found to be significant ( $p > .05$ ), the difference between the groups after the education was found to be significantly significant ( $p < .05$ ).	Theory or Model not used.
Mbakaya et al., 2023/ Malawi	Quasi-Experimental Design T0: Before the start of the intervention T1: After intervention T2: 3 months after completion of the intervention	(N=53) Children Age: 3-6	Hand Hygiene Program	-	16 Sessions	Handwashing Knowledge Scale (T0 T1 T2) Observational Checklist (T0 T1 T2)	A statistically significant difference was determined between hand hygiene knowledge scores and 5-step hand washing technique scores ( $p < .05$ ).	Theory or Model not used.
Çıtak Tunç and Yavaş, 2022/ Turkey	Quasi-Experimental Design T0: Before the start of the intervention T1: After intervention T2: 4 weeks after completion of the intervention	(N=72) (IG: 40; CG: 32) Children Age: 3-6	Body Safety Training Program	Only Body Safety Training	7 Sessions	What If Situations Test (WIST). (T0 T1) (T2 only to the intervention group)	At the end of the program, it was determined that there was no statistically significant difference between the two groups ( $p > .05$ ).	Theory or Model not used.
Kemer and İşler Dalgıç, 2022/ Turkey	Randomized Controlled Trial T0: Before the start of the intervention T1: After intervention	(N=87) (IG: 44; CG:43) Children Age: 5-6	Sexual Abuse Prevention Training Program	Standard School Curriculum	8 Sessions	Body Recognition and Body Safety Information Form (T0 T1)	It was determined that there was a statistically significant increase in the ability of children in the intervention group to recognize private parts of the body ( $p < .05$ ).  It was determined that the levels of noticing appropriate/inappropriate touching increased in the pre-test and post-test of the intervention and control groups, but there was no statistically significant difference between the two groups ( $p > .05$ ).  It was determined that the rate of knowing body protection skills was higher in the intervention group ( $p < .05$ ).	Theory or Model not used.
Zhang et al., 2021/ China	Randomized Controlled Trial T0: Before the start of the intervention T1: 2 months after the start of the intervention T2: 4 months after completion of the intervention T3: 6 months after completion of the intervention	N= 582 Children and Parent (IG: 289; CG: 293) Children Age: 3-4	Hand Hygiene Education Program (for children)  Health Education Program (provided seminar, group interview, and WeChat via for parent)	Standard Hand Hygiene Curriculum	8 Sessions (for children)  Eight weeks (for parents)	Hand Hygiene Behaviors of Children and Parents (T0 T1 T2 T3-for children) (T0 T1-for parents) Knowledge Level Questionnaire on Prevention of Communicable Diseases (T0 T1- for parents)  School Attendance Form(T0 T3) Doctor's Diagnosis Laboratory Test Results	It was determined that families in the intervention group had better knowledge about hand hygiene and infection than families in the control group.  It was determined that the number of absences due to infection was lower in children in the intervention group than in children in the control group.	Theory or Model not used.

**Table 1**  
continued

Main characteristics of the studies included in the systematic review (n = 15)

Author/ Year/ Country	Study Design	Sample Characteristics	Intervention	Control Group Intervention	Intervention Duration	Instruments	Primary Outcome	Theory/ Model
Akkaya and Sezici, 2021/ Turkey	Randomized Controlled Trial T0: Before the start of the intervention T1: After intervention	N: 100 (IG: 50; CG: 50) Children Age: 4-6	Toothbrushing Program	Standard School Curriculum	15 Sessions	Toothbrushing Protocol (T0 T1) Plaque Index Evaluation Form (T0 T1)	Statistically significant improvements in tooth brushing and plaque control were found in children in the intervention group compared to children in the control group (p< .05).	Theory or Model not used.
Aboelmagd et al., 2019/ Egypt	Quasi-Experimental Design T0: Before the start of the intervention T1: After intervention	N: 100 (IG1:50 IG2:50) Children Age: 3-6	Education Program on Sexual Harassment Prevention	Both groups received the same training.	4 Sessions	Questionnaire on children's information on sexual harassment	It was determined that the education provided in schools located in two regions with different sociocultural levels was effective in increasing the knowledge and practices of preschool children regarding sexual harassment (p< .05).	Theory or Model not used.
Costa et al., 2019/ Brazil	Quasi-Experimental Design T0: Before the start of the intervention T1: After intervention	N: 39 Children age: 3-4	Nasal Hygiene Behavior Development Program	-	2 Sessions	With the observation of healthy behavior (T0 T1)	It was determined that there was a statistically significant difference in healthy nasal hygiene behaviors after the program (p< .05).	Theory or Model not used.
Suen and Cheung, 2019/ Hong Kong	Quasi-Experimental Design T0: Before the start of the intervention T1: After the intervention	N: 39 (IG:15; CG: 24) Children Age: 5-6	Hand Hygiene Program	Standard School Curriculum	4 Sessions	Hand Hygiene Knowledge Questionnaire for Children (T0) Use of Hand Scanner for Assessing the Coverage of Hand Sanitizer (T1)	After the application, it was determined that the intervention group had a higher level of knowledge about hand hygiene than the control group (p<.05).  Significant improvements were observed in hand hygiene performance in the left palm and back of the hand, and in the right palm in the intervention group (p<.05).	Theory or Model not used.
Bermejo Martins et al., 2019/ Spain	Randomized Controlled Trial  T0 = Before the start of the intervention T1 = After the intervention T2 = seven months after completion of the intervention	N: 37 (IG: 19; CG: 18) Children Age: 5-6	Social and Emotional Development Program (CRECES)	Standard School Curriculum	8 Sessions	Test Peabody-I Children (T0) Test Perceval V.2.0/ Child (T0 T1 T2) PKBS-I Scale/ Caregiver (T0 T1 T2) Chp-Ce/Pe Questionnaire Child/ Caregiver (T0 T1 T2) Semi-Structured Interview/ Caregiver (T1) Semi-Structured Interview/Caregiver And Children (T1)	It was determined that there were positive effects on the emotional perception and resilience levels of children in the intervention group (p<.05).	Model of Social and Emotional Competence Development
Ayyıldız and Cimete, 2019/ Turkey	Quasi-Experimental Design T0: Before the start of the intervention T1: After intervention T2: 3 months after completion of the intervention	N: 67 Children and Parent (IG: 36; CG: 31) Children Age: 5-6	Social Skills Development Program (for children)  A booklet containing positive and negative communication examples, violent behaviors, influencing factors, and preventive approaches was given (for Parents)	Standard School Curriculum	30 Sessions	Parental Attitude Scale (T0) Social Skills Assessment Scale (SSAS) (T0 T1 T2) Chart to Monitor Verbal and Behavioral Violence in Children (for six months) Parent Interview Form (T1)	It was determined that the increase in social skills scores and the decrease in violent behaviors of the children in the intervention group were higher than the control group children (p<.05).  Parents in the intervention group stated that they started to empathize with their children and use the "I" language after the program.	Gardner's Multiple Intelligence Theory

**Table 1**  
**continued**

Main characteristics of the studies included in the systematic review (n=15)

Author/ Year/ Country	Study Design	Sample Characteristics	Intervention	Control Group Intervention	Intervention Duration	Instruments	Primary Outcome	Theory/ Model
Akcan and Ergun, 2019/ Turkey	Quasi-Experimental Design T0: Fifth week of the education T1: 19th week of the education T2: End of the education year ( 38th week of the education period)	N: 90 (Children and Parent) (IG:45; CG:45) Children Age: 5-6	Aggressive Behavior Prevention Program (for children) (ABPP)  A training program consisting of 8 face-to-face sessions to prevent aggressive behavior (for parents)	Standard School Curriculum	12 Sessions	Aggressiveness of the Eyberg Child Behavior Inventory (T0 T1 T2) Preschool Social Behavior Scale-Teacher Form (T0 T1 T2) Victimisation Scale (T0 T1 T2)	It was determined that the program reduced the aggressive behavior of children in the intervention group.  There was no significant difference between the two groups in terms of peer bullying (p>.05).	Bandura's Social Cognitive Theory
Sezici et al, 2017/ Turkey	Randomized Controlled Trial T0: Before the start of the intervention T1: After intervention T2: 3 months after completion of intervention	N: 79 (IG: 39; CG: 40) Children Age: 4-5	Play Therapy	Standard School Curriculum	16 sessions	Social Competence and Behavior Evaluation Scale (T1 T2 T3)	It has been determined that play therapy helps preschool children develop their social, emotional and behavioral skills.  It has also been determined that it provides benefits such as reducing children's fear and anxiety levels, improving their communication and coping skills, and increasing their self-confidence.	Bandura's Social Cognitive Theory
Sigaud et al, 2016/ Brazil	Quasi-Experimental Design T0: Before the start of the intervention T1: After intervention	N: 44 Children Age: 3-6	Tooth Brushing Program	-	Three sessions	Behavior Assessment Questionnaire (T1 T2)	A significant increase in the adoption of appropriate behaviors regarding tooth brushing was detected (p<0.01).	Theory or Model not used.

**Interventional Methods**

When the school-based studies included in this systematic review and conducted by nurse researchers for children aged 3-6 years were examined; Personal Hygiene Program to help children introduce personal hygiene habits (18), Hand Hygiene Program to improve hand hygiene (28,30), Nasal Hygiene Behavior Development Program to improve nasal hygiene behavior (26), Tooth Brushing Program to gain appropriate tooth brushing habits (16,29), Home Accident Prevention Risk Reduction Training to reduce the risk of home accidents (22), Sexual Abuse Prevention Training Program to increase body awareness and safety (19), Body Safety Training Program (27), Sexual Harassment Prevention Training Program (23), Social and Emotional Development Program (CRECES) (17) and Play Therapy (20) were applied to improve social and emotional competence. In the studies, it was determined that the duration of the intervention was between 2 sessions and 16 sessions.

When the studies included in the Systematic Review and conducted by nurse researchers and involving parents were examined, the Hand Hygiene Program

(21) to increase hand hygiene, Aggressive Behavior Prevention Program, and Social Skills Program (24,25) were applied to prevent violent behaviours. In the studies, it was determined that the duration of the intervention was between 8 and 30 sessions.

**Didactic Resources Used in Educational Interventions**

It is effective to implement educational interventions with preschoolers to help them acquire proper conduct. The techniques and playthings used in these interventions ought to be suitable for the age group of the child. (29). When the studies in the systematic review were examined, it was found that modelling, using posters, stickers, game activities (21,28), animation video, models, toy with fluorescent features (18,30), puppets, stories, crepe paper with gelatin, picture card games (26), presentation with pictures, toy, educational music video (16), model, toy, toothbrushes, music video, picture cards (29), hide and seek game, model house (22), creative drama (19,27), videos, pictures (23), game activities (17,20), stories, cartoons, pictures, puppets, flower seeds, flower pots, emotion cards, and poetry (24,25).

**Table 2** Table 2 Results of JBI critical appraisal tools for randomized controlled trials

JBI Critical Appraisal Checklist for Randomized Controlled Trial		Questions													Score
		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Bıyıkoglu Alkan et al., 2023	Unclear	No	Yes	No	No	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	8
2	Kemer and İşler Dalgıç, 2022	Yes	Yes	Yes	No	No	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	10
3	Zhang et al., 2021	Yes	Yes	Yes	No	No	Unclear	Yes	Yes	Yes	Yes	No	Yes	Yes	9
4	Akkaya and Sezici, 2021	Unclear	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	9
5	Bermejo Martins et al., 2019	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	9
6	Sezici et al., 2017	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	10

Question: 1- Was proper randomization used for the assignment of participants to treatment groups? 2- Was allocation to treatment groups concealed? 3- Were treatment groups similar at the baseline? 4- Were participants blind to treatment assignment? 5- Were those delivering treatment blind to treatment assignment? 6- Were outcomes assessors blind to treatment assignment? 7- Were treatment groups treated identically other than the intervention of interest? 8- Was follow-up complete, and if not, were differences between groups in terms of their follow-up adequately described and analyzed? 9- Were participants analyzed in the groups to which they were randomized? 10- Were outcomes measured in the same way for treatment groups? 11- Were outcomes measured reliably? 12- Was appropriate statistical analysis used? 13- Was the trial design appropriate, and were any deviations from the standard randomized controlled trials design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?

**Theories-Model Used in the Intervention**

It was determined that the Social and Emotional Competence Development Model, Gardner's Multiple Intelligence Theory, and Bandura's Social Cognitive Theory were used in the studies (17,18,20,24,25).

**Discussion**

This systematic review provides a comprehensive analysis of school-based studies involving nurses as researchers and, to the best of our knowledge, is the first study to analyze experimental studies (Randomized Controlled Trials (RCTs) and quasi-experimental studies) on this topic.

When the compiled studies were examined, many activities of nurses, which can be defined as protecting and improving the health of preschool children and preventing diseases, were emphasized. Despite the various health education programs included in the studies, many of them focus on physical health (16,18,21,26,28,29,30) or it has been determined that

programs are implemented for situations that may affect physical, emotional and social health together (19,22-25, 27). It was determined that only two of the studies conducted by nurse researchers in the preschool period, when development accelerated, were conducted to support social and emotional development such as communication and coping skills, emotional perception and resilience (17,20).

**Interventions to Support Physical Health**

Although effective hand washing is the cheapest, simplest, and easiest practice to control infections in the community, hand washing rates are pretty low. Hand hygiene training is fundamental in preventing epidemics that may affect the school population (31). Three studies in the review investigated the impact of a hand hygiene program (21,28,30). As a result of the studies, it was determined that the level of knowledge about hand hygiene increased after the intervention, significant improvements were observed in hand hygiene performance, and absenteeism due to infection decreased in the children in the intervention

**Table 3** Results of JBI critical appraisal tools for quasi-experimental designs

JBI Critical Appraisal Checklist for Quasi -Experimental Studies		Questions									Score
		1	2	3	4	5	6	7	8	9	
1	Mbakaya et al., 2023	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	8
2	Ayyıldız and Cimete, 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
3	Akcan and Ergun, 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
4	Costa et al.,2019	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	7
5	Suen and Cheung, 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
6	Sigaud et al., 2016	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	8
7	Aboelmagd et al., 2019	Yes	Yes	Unclear	No	Yes	Yes	Yes	No	Yes	6
8	Çıtak Tunç and Yavaş, 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9
9	Altundağ and Körükçü, 2023	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	9

Question:1- Is it clear in the study the 'cause' and the 'effect' (i.e., there is no confusion about which variable comes first)? 2- Were the participants included in any comparisons similar? 3- Were the participants in any comparisons receiving similar treatment/care other than the exposure or intervention of interest? 4- Was there a control group? 5- Were there multiple measurements of the outcome, pre- and post-intervention/exposure? 6- Was follow-up complete, and if not, were differences between groups in terms of their follow-up adequately described and analyzed? 7- Were the outcomes of participants included in any comparisons measured in the same way? 8- Were outcomes measured reliably? 9- Was appropriate statistical analysis used?

group. Therefore, interventions carried out by nurses can increase the hand hygiene compliance of preschool children and parents, prevent the spread of diseases and infections, and play a significant role in reducing absenteeism from school due to infections.

Schools, essential in shaping children's healthy habits, pose a risk factor for respiratory tract infections. The findings of a cohort study of 1827 children from 1797 parents showed a rapid increase in respiratory tract infections two months after starting kindergarten (32). As a result of the Nasal Hygiene Behavior Program implemented for health promotion and prevention of respiratory diseases, it was determined that the children participating in the study were effective in healthy nasal hygiene behaviours (26).

Oral and dental health is an integral part of general health. Regular and effective tooth brushing protects oral and dental health and prevents dental caries. Dental caries in children can affect their nutrition, growth, and general development (33). In the tooth brushing behaviours reported by parents for the preschool population, it was determined that only

7.8% of children performed all procedures related to tooth brushing correctly (34). Since children spend a significant portion of their day at school, acquiring social skills and health habits, including oral health habits, is mainly applicable, which can lead to the acquisition of lifelong positive behaviours (35). In this context, it can be said that nurses are in an appropriate position to protect and improve preschool children's oral and dental health, especially in terms of providing information and support to children and parents (36). In the study conducted by Akkaya and Sezici, 2021; Sigaud et al., 2017, in which the effect of the tooth brushing program was examined, it was determined that significant improvements were observed in the adoption of appropriate behaviours related to tooth brushing as a result of both studies (16, 29).

In a study included in the compilation, a personal hygiene program was implemented to ensure hand and oral hygiene, and as a result of the program, a significant increase was observed in the scale scores of the intervention group for hand washing and oral dental health compared to the control group (18).



### **Interventions to Support Social and Emotional Health**

Social-emotional competence is considered the cornerstone of academic performance and a protective element for the healthy development of children (37). It is recommended that children and adolescents be educated at an early age to acquire life skills that will increase their well-being. In this respect, schools are of great importance in preparing students for life. Nurses have vital responsibilities in promoting healthy lifestyles in schools, but there are limited studies supporting social and emotional development (38-40).

Considering the importance of early childhood experiences for later development, preschools are environments where children can develop and acquire essential skills to increase their academic, social, emotional, and behavioural competencies before starting primary school (41). When the studies conducted in the preschool period and included in the review are examined, the study conducted by Bermejo-Martins et al., 2019, which examined the effects of the CRECES, which has components such as emotional awareness, emotional regulation, emotional independence, social skills and life skills, were examined, positive effects were found on emotional perception and resilience in children in the intervention group (17). Similarly, Play Therapy was found to help preschool children improve their emotional and behavioural skills (20).

### **Interventions to Support Physical, Social and Emotional Health**

Violence, which can have behavioural, emotional and social consequences, is a leading global public health problem. Interventions in early childhood are important in the primary prevention of violence. Positive behaviours or practices in this age group will prevent problems from occurring in later years (42). When the results of studies conducted to prevent violent behaviour were examined, it was determined that the practices reduced the violent behaviour of preschool children (24,25).

Accidents and injuries are common for people of all ages. However, children have a higher risk of injury because they are curious and desire to explore (43). A retrospective study examining the data of 1333 children admitted to the emergency department due to home accidents determined that 24.8% of children were between the ages of 3-6 (44). Preventing child injuries requires safety education, which includes imparting safety guidelines and best practices (43). A systematic review by Abbassinia et al. found that active interventions, such as education, are more effective in

preventing home accidents in children under 5 (45). In the study examining the effects of Home Accident Prevention Risk Reduction Training implemented by nurse researchers on children, after the training in the intervention group, the mean scores of children for recognizing the circumstances that pose a risk of accident in the home environment were determined to increase significantly (22).

Child sexual abuse is a health issue that can have severe short- and long-term effects on children's physical, psychological, and social development. Any negativity experienced in early childhood, when children should create positive feelings about themselves, others, and the world, traumatically affects the child's development as a healthy individual (41,47). Therefore, children receive education on this issue as early as possible. The preschool period, which is the period when gender differences are learned and the child is curious about exploring his/her body and covers the age range of 3-6 years, is the appropriate age period for the child's body recognition and body safety education (27,47). Conducting interventional studies on this issue and planning preventive actions is essential. A systematic review study determined that most of the interventions were implemented by teachers in educational settings, focused on preschool and primary school children, and focused on improving children's understanding of their own bodies and appropriate and inappropriate touch (47). It is emphasized that child and school health nurses are in an ideal position to inform children and parents to prevent sexual abuse (48). The programs included in the systematic review and conducted by nurses using creative drama, videos, and pictures were found to be effective in helping children in the intervention group to know the private parts of the body and body protection skills (19,23,27).

### **Limitations**

This systematic review has some limitations. The inclusion of articles that were only available in English was the systematic review's most significant constraint. If articles published in other languages are included, the number of articles reviewed will increase. The reviewed studies varied in terms of intervention types and follow-up periods. The study is limited to synthesizing the research findings in the systematic review.

### **Implications for Practice**

Schools are suitable environments for the development and maintenance of children's health. School health services; are an important service in protecting and developing health to protect the physical, social and

mental health of children and adolescents, and in providing the foundation of future generations and a healthy society. Studies have shown that nurses have significant effects on protecting and developing the health of school children.

It is thought that this systematic review will guide the interventions planned to be applied to preschool children in the school environment regarding intervention topics, intervention duration, follow-up period, results obtained, and theories used. Studies need to evaluate the effectiveness, applicability, acceptability, and possible difficulties in implementing health education programs for preschool children and parents with children to gain positive health behaviours that will last throughout life.

It was determined that nurse researchers used the Emotional Competence Development Model, Gardner's Multiple Intelligence Theory, and Bandura's Social Cognitive Theory in school-based interventions applied to preschool children (17,18,20,24,25). Planning research based on theories and models provides a systematic approach to evaluating the effectiveness of the intervention (49). Therefore, it is thought that researchers will be guided by the theory- or model-based planning of studies carried out by nurses.

## Conclusion

As a result of the systematic review of the studies included in the research, it was determined that school-based programs implemented by nurses and focusing on health promotion for preschool children were effective in improving the physical, social and emotional health of children. Our findings underline that nurses are more focused on improving children's physical health and that more studies are needed to improve children's social and emotional competencies such as emotional awareness, emotion regulation, empathy, coping, and communication skills. These results should be interpreted with caution due to the limited number of studies and small sample size. Comprehensive, high-quality RCTs assessing long-term effects are needed to obtain the best evidence on the effectiveness of interventions.

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## Conflict of Interest Statement

The author declares that there is no conflict of interest

that could be perceived as prejudicing the impartiality of the research reported.

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## Authors Contributions

GA: Conceptualisation, Methodology, Investigation, Writing – original draft, Writing – review & editing.

EK: Conceptualisation, Methodology, Writing-original draft, Writing – review & editing, Supervision.

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