

The Relationship between Physical Education and Cognitive Development of Preschool Children

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Abstract

Brain development is a complicated process, and environmental stimuli during this developmental stage may modify the brain's functional growth and determine the integrity of the brain throughout life (Gomes da Silva & Arida, 2015).

Although the relation between physical education and cognitive development is not very clear, some studies have shown that exercise and aerobics can improve the function of the brain, increase the size of critical brain structures and improve cognition in children and older adults. (Erickson et al., 2009, 2011; Chaddock et al., 2014). Such studies provide compelling evidence for the powerful effects of exercise on the brain.

The researcher visited thirteen (13) public and private preschools in Qatar and conducted a structured interview with twenty (20) randomly selected Physical Education teachers to investigate the relationship between physical activities and cognitive skills of preschool children. The study showed that the physical education classes are favored among children their positive respond to it encourages healthy children means not only physically but also mentally which ease understanding of the academic lessons.

Keywords: physical education, cognitive development, academic education, pre-school

1. Background

Physical education is an integral part of the holistic development of a child (Chaddock et al., 2014). Physical Education is not just about playing games and getting the child to move; PE teachers also have the great responsibility of developing the preschooler's skills in the three domains of learning and health-related fitness (psychomotor, cognitive, and affective).

Over the past two decades, Qatar has witnessed constantly ongoing educational reforms including excessive efforts establishing the curriculum standards and providing very high-quality school buildings and facilities. Moreover, the Ministry of Education and Higher Education has been hiring highly qualified P.E teachers following them up through the Department of Educational Supervision and the supervisors of the PE Department, with the aim of providing teachers with the necessary skills to develop their professional growth, as well as providing them with continuous training programs to develop their knowledge and teaching skills. These programs are often organized at Qatar University and at the the ministry's Professional Development Centre in Al Waab area.

The building and design of these schools follows the Qatari code and standard design model for schools, comprising various facilities including science, language and IT laboratories, as well as sports and art halls, multipurpose halls, gyms, libraries and classrooms in addition to outdoor spaces with shaded parking spaces, green areas, playgrounds and service buildings. The design also complies with safety requirements of the Global Fire and Security Systems and Qatari Civil Defense.

Physical education helps to improve the level of active and healthy life, encourages students to participate and enjoy sports activities, maintain an active and healthy style, apply practices that maintain health and well-being, and contribute to the mental, emotional and social development of students (Erickson et al., 2019). Accordingly, preschools will continue to emphasize the importance of engaging in Developmentally Appropriate Practice – a concept of matching practice with what we know about the development of young children (Essa, 2011). It is essential for teachers to be aware of the different types of play that develop the children's physical, social, and cognitive skills as they grow up.

According to Qatar National Vision 2030 (GSDP, 2008), it aims at transforming Qatar into an advanced country by 2030, capable of sustaining its own development and providing for a high standard of living for all of its people for generations to come. Qatar National Vision rests on four pillars: human development, social development, economic development and environmental development. In the human development, Qatar aims to build a modern world-class educational system that provides students with a first-rate education, comparable to that offered anywhere in the world. The system will provide citizens with excellent training and opportunities to develop to their full potential, preparing them for success in a changing world with increasingly complex technical requirements. The system will also encourage analytical and critical thinking, as well as creativity and innovation (GSDP, 2008).

This study was conducted in Qatar, a country known for hosting lots of regional and international sport events including the AIBA, World Boxing Championships, IPC, Athletics World Championships, Asian Youth Athletics Championships, ATP and WTA tennis tours, the International Volleyball Federation Beach World Tour (Qatar Olympic Committee, 2015). All of these events were seen as essential precursors to hosting the 2019 World Athletics Championships and the 2022 FIFA World Cup (Al-Thani, 2016). In addition to that, Qatar's National Sports Day was initiated in 2012 during which thousands of people from different ages participate in a variety of sports activities and events all through the country. Moreover, the School Olympics Program was established in the same year during which all school students in Qatar participate in various sport activities. All these efforts aimed at promoting health and fitness through encouraging a healthy lifestyle and physical activities.

This study aims at investigating the relationship between play activities and cognitive skills of preschoolers and how P>E teachers use play activities to promote the child's cognitive skills in public and private preschools in Qatar.

1.1 Physical Development versus Cognitive Development

Play is an essential part of the child's routine. Play activities considerably contribute to healthy child's holistic development. Play is a natural activity for young children and gives numerous opportunities for children to learn and develop physically, socially and mentally (Mico, 2009). Therefore, it is significant in child development and learning.

According to World Health Organisation (WHO), physical activity has significant health benefits for hearts, bodies and minds. In a 24-hour day, children 3-5 years of age should spend at least 180 minutes in a variety of types of physical activities at any intensity, of which at least 60 minutes is moderate- to vigorous-intensity physical activity, spread throughout the day; more is better (WHO, 2020).

The developmental theories of Piaget and Vygotsky offer frameworks for considering the effects of play activities on cognitive development. Piaget sees play as practice for strengthening of skills and existing schema (i.e., assimilation), (Piaget, 1978). Vygotsky, on the other hand, describes a more central role of play as a mechanism for building cognitive structures, such as symbolic representation (Vygotsky, 1986).

According to Piaget, children take part in four types of play that reveal their level of cognitive development: functional play (including body movement with or without objects), constructive play (using objects to make things in an organized way), symbolic play (role playing and pretending to be someone else), and games with rules (Johnson, Christie, & Wardle, 2005).

A growing body of research has shown that physical activity in early childhood promotes a wide range of cognitive skills, including attention, executive functions, memory, and learning (Erickson et al., 2019; Hillman et al., 2018; Zeng et al., 2017; Mavilidi et al., 2015; Khan & Hillman, 2014).

Various studies suggest that play supports children's cognitive development in different aspects such as perspective-taking, memory, language skills, and creativity (Isenberg & Quisenberry, 2002; Stegelin, Fite, & Wisneski, 2015).

Long (2022) states that all children should have access to 60 minutes of physical activity every day, with at least 30 minutes taking place in schools and the remaining 30 minutes taking place outside school.

Some studies showed that play can develop the child's planning skills, problem-solving skills, academic performance skills, and linguistic development (Isenberg & Quisenberry, 2002; Wood & Attfield, 2005).

Other studies pointed to the importance of play in the life of preschoolers. Marcon (1999) found that the children in more play-based preschools showed greater mastery of basic skills, and her later follow-up continued to show an effect. Diamond, Diamond, Barnette and Munro (2007) and Hyson, Copple, and Jones (2007) found that pre-school children who used play-based curriculum achieved higher scores on measures of executive function and

skills underpinning self-regulatory abilities than children using regular, instruction-based pre-schools.

Although the Qatari government gives a high premium to sports and well-being of school children, studies investigating physical education effects of physical education on preschoolers' cognitive development are non-existent. Taking into account the significance of holistic child development as stated in Qatar Vision (2030), and given the importance of physical activity during the development stage of preschool children, all of these motivated this researcher to conduct this research study, which would be important in terms of investigating the relationship between physical activity and the child's cognitive development in Qatari preschools.

1.2 Outdoor Vs Indoor activities and Physical activity Pyramid

Preschool children play in two settings: indoors and outdoors. Both settings are crucial to children's healthy development physically, mentally and socially.

Vygotsky (1978, p.102) states: *"In play, a child is always above his average age, above his daily behavior; in play, it is as though he were a head taller than himself. As in the focus of a magnifying glass, play contains all developmental tendencies in a condensed form; in play, it is as though the child were trying to jump above the level of his normal behavior"*

In a low-pressure environment with time for activities, children naturally create new and increasingly complex connections. Through play activities, learning comes alive and goes well beyond the minimum assigned curriculum covered during regular academic classes.

According to several studies, both indoor and outdoor plays have their advantages and disadvantages. Therefore, it is the role of educators to maximize on the benefits and minimize the disadvantages of each. Integrating both types of play into children's play routine is preferable as there are times when one option may not be possible for one reason or another.

Indoor play activities can be used to improve creativity through arts and crafts, playing puzzles, etc. These activities encourage preschoolers to be more thoughtful, imaginative and expressive than in outdoor activities. In addition, the indoor environment can be a great path for children to self-regulate, improve their language skills, pay attention to instructions and support their social and cognitive skills. Indoor play activities often have a low risk of injury and sickness. Moreover, it also allows for easy supervision by teachers and caregivers.

However, according to, et al. (2008) children playing outdoors seem more active than children playing indoors. Cleland also stated that the most important advantage of outdoor activities is the long lasting effect about outdoor play is the long-lasting effects on the child's holistic development.

According to Towell (2005), playing outside makes children use time effectively during their physical and mental development. This happens when play activities are designed and organized in harmony with the child's growth, needs and interests.

Several studies in the United States revealed that using outdoor classrooms and nature-based experiential schools achieve significant student improvements in most school subjects such as, languages, mathematics, arts and science (Cooper, 2015).

Burdette and Whitaker (2005) stated that outdoor play encourages a child to learn on multiple levels and therefore causing their brain to develop at a fast rate. This in turn supports their academic achievement at school and makes them more sociable.

In their study of the quality of outdoor play spaces of preschools in Turkey, Çelik et al. (2012) noticed that outdoor spaces were not used efficiently, and were not suitable for children to play in. The results also revealed that the physical provisions and preparations of these spaces were unobserved.

Other studies have shown that physical arrangements and green spaces in Turkish schools are not enough to meet the needs of children, adversely affecting education. They also showed that outdoor space arrangements for preschools were mistreated and not used in an effective way. (Çelik, 2012; Karatekin & Çetinkaya, 2013; Volkan Aksu & Demirel, 2011).

2. Methodology

The descriptive-correlation method was used by the researcher to investigate the relationship between play activities and cognitive development of the preschool children. The respondents were forty (40) female P.E preschool teachers during the School Year 2021- 2022, who were randomly chosen from fifteen (15) public preschools and five (5) private preschools from different districts in Qatar. The preschools' children ranged in ages from 4-5 years. The sample teacher respondents were thirty (30) public preschool teachers and ten (10) private

preschool teachers. Teachers were asked to rate their preschool children as they perceive the physical activities and cognitive skills children achieved.

For determining the relationship between play activities and cognitive skills, the teachers' responses were considered as the main source of data. The frequency of use of the cognitive activities, and the levels of realization of cognitive skills according to respondents' perception were data considered the interview instrument was divided into two sections. The first section includes the types of cognitive play activities and the second section includes the cognitive skills that promote the child's cognitive development. To measure the frequency of use and the level of achievement of cognitive skills Likert scale was used. To determine the clarity and appropriateness of the interview items, five preschool experts from the Ministry of Education made the content validation.

The interview questions were divided into two sections: Section I was labeled "the type of cognitive play activities by Preschoolers". It consisted of twelve (12) items related to Functional Play, Constructive Play, Dramatic Play and Games with Rules.

Section II was labeled "Cognitive Skills developed through Play activitie". This section consisted of (12) items including Problem-solving, Decision- making and Creativity. To decide the level of achievement of the cognitive skills, statistical analysis was conducted using the Statistical Package for the Social Sciences SPSS.

The researcher also implemented the observation method to compare the play environment in public and private preschools and to examine the impact of the interactive environment on the cognitive development of the children. The classes were observed for 15 hours over a five weeks period. Observation was conducted during the regular preschool schedule including indoor and outdoor activities.

3. Results and Discussion

The findings below give a description of the results on the relation between play activities and cognitive development of preschoolers as perceived by preschool teachers in the State of Qatar, Table 1 below shows that "Functional Play" is the most frequent type of play used by preschoolers.

Table 1. Frequency of use of the different types of play activities of preschool children

Play Type	Weighted Mean	Interpretation
Functional Play	3.30	Always
Constructive Play	3.10	Always
Dramatic Play	2.97	Often
Games with Rules	3.04	Always

As shown in Table 1, "Functional Play" is the most frequently used experience. Functional play is the earliest to appear "First Play" and continues throughout childhood and it aims at increasing curiosity and motivating children to learn more. When children are motivated in an interesting and challenging environment, they get more engaged to explore and enrich their language and imagination.

Results show that "Constructive Play" is the second most frequently used experience. Constructive play involves manipulation of materials to create things: sand, art materials (paint, large chinks, clay, paper), water, woodwork activities, sticks and stones, and a variety of different sized and different type of blocks (Wardle, 2000).

Through observation, it was noticed that teachers encourage and support children to participate in constructive play, and provide a plenty of time, multiple materials, diverse stories, fairy tales, many play experiences and safe environmentfor children. However, some teachers were happy monitoring children participating in constructive play without paying attention to the level of engagement in play. Teacher's interest, arrangements, support and encouragement will strengthen children's high quality of constructive play

According to teachers, all cognitive play activities were "always" or "often" used by children. However, the "dramatic play" and "games with rules" were the two lowest frequently used types of play. Dramatic play was only used "often".

Dramatic play supports creativity and self-expression. It also can help children learn real life skills and social intellectual skills needed throughout their lives. In addition, dramatic play builds a strong foundation for future success in school. In dramatic play, a child is required to recall past experiences, select relevant aspects and use gestures and words correctly. These are considered high-level intellectual tasks.

Studies have shown a connection between high levels of socio-dramatic play in preschool and cognitive, verbal

and social ability measures in the early grades (Smilansky & Shefatya, 1990).

Through observation, some obstacles were noticed that hindered the use of dramatic play activities. First, In large classes in Arabic preschools, role playing was not possible to be done effectively because not all of the students had the option to participate. In most dramatic play activities, only two or three individuals participated in a situation, so the rest of the students just had to sit and watch. Another obstacle was embarrassment. It was clear that some students were embarrassed and worried about what others will think of them and thus tentative about participating in a dramatic scenario.

Results also show that “Games with Rules” is the third most frequently used experience. Jean Piaget (1952) in his theory of the levels of cognitive play stated that the highest category of play was games with rules emerging in children between the ages of 7 and 12. However, Lev Vigotsky (1978) stated that through dramatic play and role play preschoolers actually were able to follow rules in play. Through observation, preschool children were able to participate in simple games with rules, such as hide and seek, matching games, changing block structures and board games with spinners.

Games with rules is more than a form of entertainment and fun for children. Since they include objectives, goals and competition, they provide preschoolers. with an interactive experience that supports a sense of achievement. The engagement between children makes them more motivated and active learners struggling to achieve their goals. These experiences are easy to help them in their daily situations as they become older.

Table 2. Cognitive play activities of the preschool children

Functional Play	Weighted Mean	Interpretation
1. Throwing the ball	3.64	Always
2. Catching the ball	2.90	Often
3. Playing with push- pull toys	3.38	Always
4. Playing with percussion toys and music instruments	3.28	Always
Average Weighted Mean	3.30	Always
Constructive Play	Weighted Mean	Interpretation
1. Constructing objects using building blocks	3.20	Always
2. Building objects using legos	3.10	Always
3. Modeling objects using clay	3.04	Always
4. Playing jigsaw puzzles	3.06	Always
Average Weighted Mean	3.10	Always
Dramatic Play	Weighted Mean	Interpretation
1. Portraying roles as being a teacher, doctor, nurse & policeman	2.80	Often
2. Playing home simulation games with friends	3.18	Always
3. Playing dolls/robots/ monsters, then making dialogues on them.	2.90	Often
4. Playing chasing games and ice and water games.	3.02	Always
Average Weighted Mean	2.97	Often
Games with Rules	Weighted Mean	Interpretation
1. Playing hide and seek	2.90	Often
2. Playing tug of war and wall ball	3.08	Often
3. Playing board games such as snake and ladders, count your chicken, etc.	3.06	Always
4. Rearranging and changing block structures.	3.12	Always
Average Weighted Mean	3.04	Always

Table 2 shows the cognitive play activities practiced by the preschool children, their weighted means and interpretations.

3.1 Functional Play

Results show that “throwing the ball” was the most commonly used functional play by preschoolers with a mean of 3.64. The second commonly used functional play was “Playing with push- pull toys” which got a mean of 3.38. The average mean of functional play was 3.30 which means that functional play is the most common type of

cognitive play used in preschools. Functional play is considered the most simple type of play in which small children engage and do an activity over and over purely for pleasure and entertaining themselves.

3.1 Constructive Play

As shown in table 2, “constructing objects using building blocks” was the most commonly used constructive play used by preschoolers with a mean of 3.20. The second commonly used constructive play was “building objects using legos” with a mean of 3.10. The average mean of constructive play was 3.10 which means that constructive play is common in these preschools.

Through observing sessions, it was clear that no matter what activity the child was doing during constructive play, they were learning about the features of different materials, experimenting with thought processes, engaging their curiosity and imagination and expanding their ideas and understanding of the world.

3.3 Dramatic Play

Table 2 shows that “playing home simulation games with friends” was the most commonly used dramatic play by preschoolers with a mean of 3.18. The average mean of Dramatic play was 2.97 which means that dramatic play is the least used type of cognitive play in terms of frequency of use.

Through observing sessions, it was clear that private preschools gives more opportunities to children to experience dramatic play than the Arabic preschools do.

Dramatic play requires acting out authentic situations and playing the roles of different characters and it is held to be regarded as an integral part of a child’s holistic development according to NAEYC (2020). Dramatic play teaches children self-regulation, conflict resolution and supports literacy.

Family roles such as father, mother, grandparent and baby brother were more commonly used in private preschools and the roles were combined into various play activities with themes related to real-life home activities

3.4 Games with Roles

Table 2 shows that “rearranging and changing block structures” was the most commonly used game with rules by preschoolers with a mean of 3.12. The average mean of “game with rules” was 3.04 which means that it is the second most used type of cognitive play in terms of frequency of use.

In addition to improving motor abilities and dexterity, these games are a vital tool for the development of children’s communication and speech. Through observing sessions, it was noticed that all preschools provided children games with rules including agreed-upon criteria for winning a game. In some cases, children were encouraged to negotiate the rules of the game in order to create the game they wish to play.

In public preschools, Qatari traditional games such as “Qais” an Taq Taq Taqeya” were commonly applied. These preschools were equally applied with contemporary games, depending on the educational activity and goal. Private schools, on the other hand, just applied the contemporary games. It was clear that traditional games allowed children to increase curiosity, competitive spirit, and developing strategies for success in competition

3.5 Cognitive Skills Developed through Play Experiences

Table 3 shows the level of children’s achievement of cognitive skills perceived by teachers.

Table 3. Cognitive skills developed through play experiences

Cognitive Skills	Weighted Mean	Interpretation
1. Problem-solving	3.16	Highly Achieved
2. Decision-making	2.88	Achieved
3. Creativity	2.76	Achieved

Table 3 shows that “problem solving” is the most “highly achieved” cognitive skill with a mean of 3.16 while decision-making and creativity were achieved with 2.88 and 2.76 means respectively.

Helping children to solve problems is a critical skill for school readiness. Parents and preschool teachers are a child’s first and most important teacher. Thus, modeling good problem solving skills is very vital. Children learn by watching teachers handle different situations and solve problems. If a teacher handles problems by shouting, throwing things, hitting, grabbing or using other intolerable strategies, a child will learn to do the same thing.

Table 3 shows that “decision-making” got a mean of 2.88 with an interpretation of “achieved”. This means that this cognitive skill is practiced quite often by preschoolers.

Decision-making is a cognitive skill that needs to be developed from early stages. Children start to try to make decisions for themselves very early; what toy to play with or who they are going to interact with. By training on decision making skills, children can start to make more mindful decisions. Activities that include decision making allow children to better assess the appropriate choices and give them a deeper understanding on the consequences of their actions, and make them more independent.

Through observing sessions, children were seen happy when they were given plenty of choices to make decisions for themselves and help their peers. Allowing a child to take a leadership role in classroom groups gives them the confidence to try and tackle challenging problems. However, the teacher, when offering children choices, must make sure not to guide them to the answers she wants. It is necessary to give them a genuine choice to make them more independent.

Table 3 shows that “creativity” got an average mean of 2.76 which is interpreted as “achieved” but not “highly achieved”. Creativity is the least achieved among the three cognitive skills assessed.

Creativity is defined as “the ability to see the new relationships, to produce unusual ideas and to deviate from traditional pattern of thinking.” (Eysenck, 1972) Creative play and activities help young children to develop physical, social, intellectual and emotional skills as well as helping to develop math skills, reading skills, imagination and self-expression.

Through observing sessions, children, in both public and private preschools, were encouraged to actively participate in creative play activities and were given the chance to express themselves and explore the activities in a safe appropriate environment. However, some children in public preschools were reluctant to participate in creative activities.

In Qatar, 46% of the school-aged children are overweight or obese. (Al-Thani et al., 2018). The absence of creative childhood play has several negative consequences. In addition to overweight and obesity figures, which seem to be rising each year, the lack of active play which includes creative play has tremendous impact on the child’s emotional and cognitive development. Children who are involved with plenty of self-directed creative play develop better abilities to regulate their own behaviors and emotions, compared to other children.

Table 4 shows that regarding “problem-solving”, play activities (1,2 and 3) were “highly achieved” by preschoolers. The most developed cognitive activity was “classifying objects,” with a mean of 3.38. Although “differentiating objects ascending to varying size” was the least achieved play activity in both types of preschools, it got a mean of 2.86 which means it is practiced quite often by preschoolers.

Table 4. Play Experiences that Develop Cognitive Skills as Perceived by Teachers

Problem-solving	Weighted Mean	Interpretation
1. Classifying objects`	3.38	Highly Achieved
2. Identifying concepts of time	3.25	Highly Achieved
3. Identifying different shapes of an objects	3.14	Highly Achieved
4. Differentiating objects ascending to varying size	2.86	Achieved
Average Weighted Mean	3.16	Highly Achieved
Decision-making and mental planning	Weighted Mean	Interpretation
1. Directing playmates on what to say as they play.	2.80	Achieved
2. Directing playmates on what to do as they play	2.85	Achieved
3. Planning the play situation	2.98	Achieved
4. Making strategies during actual play	2.88	Achieved
Average Weighted Mean	2.88	Achieved
Creativity	Weighted Mean	Interpretation
1. Describing clearly characters in dramatic play situations	3.20	Highly Achieved
2. Thinking uniquely of task while playing	2.64	Achieved
3. Explaining his/her actions art works	2.72	Achieved
4. Telling stories about the picture they draw	2.48	Achieved
Average Weighted Mean	2.76	Achieved

Regarding “decision-making and mental planning”, the play experience “Planning the play situation” got a mean of 2.98 with an interpretation of “achieved”. Although “directing playmates on what to say as they play” was the least achieved play activity in both types of preschools, it got a mean of 2.80 which means it is practiced quite often by preschoolers. The average weighted mean of “decision-making and mental planning” was 2.86.

Children observation revealed that private preschools gave more opportunities for children to choose the activities and decide whether to play alone or in a group. They also had more chances to choose the play activities and materials that interests them while playing with an interpretation of “achieved”.

Although “telling stories about the picture they draw” was the least achieved creative activity, it got a mean of 2.48 which means it is practiced quite often by preschoolers.

Through the observation sessions, most teachers showed interest and excitement while working with children. They inspired children to be curious and creative by demonstrating the tasks themselves. Some teachers were very enthusiastic to play with the possibilities and experiment alongside the children. They used children’s backgrounds, experiences, and interests as inspiration for ideas about creative activities in the classroom.

Providing a climate of inquiry was more obvious in private preschools than in public preschools. In private preschools, children were encouraged to pose questions and mostly were guided to find the answers by themselves. Most teachers in public and private preschools demonstrated high respect for children’s values and opinions. In most preschools, simple frames were used to display children’s pictures, artwork and other achievements. These frames were hanged throughout the classroom environment using ropes and ribbons.

Displaying children works was very inspiring for children to be creative and gave them a sense of pride in their work.

Table 5. Significance of relationship between cognitive play experiences and cognitive skills

Cognitive Play Type	Cognitive Skills	Pearson r	t- value	Significance of Relationship
Functional Play	Problem-solving	0.44	3.80	Significant
	Decision making	0.36	3.07	Significant
	Creativity	0.23	1.70	Not significant
Constructive Play	Problem-solving	0.32	2.41	Significant
	Decision making	-0.16	-1.36	Not significant
	Creativity	0.28	2.13	Significant
Dramatic Play	Problem-solving	0.31	2.20	Significant
	Decision making	-0.10	-0.58	Not significant
	Creativity	-0.30	2.25	significant
Games with Roles	Problem-solving	0.21	1.48	Not significant
	Decision making	0.52	4.06	Significant
	Creativity	0.48	3.56	Significant

Table 5 indicates that functional play develops the child’s cognitive skills significantly in terms of problem solving and decision making as the t-value is higher than the critical value which is 2.00. Creativity has the weakest relationship with the functional experience as the t-value was 1.70 which is lower than the critical t-value. This reveals that functional play has significant effect in developing child’s cognitive skills in regards to problem solving and decision making.

Regarding constructive play, results show moderate relationship between problem solving ($t = 2.41$), creativity ($t = 2.13$) and constructive play. This means that constructive play has significant effect in developing the cognitive skills of children in terms of problem solving and creativity. However, decision making has the weakest relationship with the destructive experience as the t-value was 1.70 which is lower than the critical t-value. This indicates that constructive play doesn’t appear to improve the cognitive skill of children in terms of decision making.

Table 5 also reveals that dramatic play has significant effect in developing child’s cognitive skills regarding problem solving and creativity as the t-value is higher than the critical value which is 2.00. However, decision making has the weakest relationship with the dramatic play experience as the t-value was -0.58 which is lower than the critical t-value. This result reveals that dramatic play has no significant effect in developing the child’s

cognitive skills in terms of decision making.

Findings also reveal strong relationship between decision making ($t = 4.6$), creativity ($t = 3.56$) and games with rules. This means that “games with rules” have significant effect in developing the cognitive skills of children in terms of decision making and creativity. However, problem-solving has the weakest relationship with “games with rules” experience as the t -value was 1.48 which is lower than the critical t -value. This indicates that constructive play doesn't appear to improve the cognitive skill of children in terms of problem solving.

4. Conclusions

Based on the results of the interview presented, it could be concluded that “functional play”, “constructive play” and “games with rules” were the most frequently used cognitive play activities in the Qatari preschools. On the other hand, dramatic play was the least used cognitive play activity.

Finding also reveals that problem solving is the highest achieved cognitive skill by preschoolers while decision making and creativity are moderately achieved by preschoolers in the sample preschools.

Regarding the relationship between the four types of play and cognitive skills, results indicate that functional play has significant effect in developing the cognitive skills in terms of problem solving and decision making skills, but doesn't have a significant effect on creativity. Regarding constructive play, results show that constructive play has significant effect in developing the child's cognitive skills in regards to problem solving and creativity but doesn't have a significant effect on decision making.

Results also show that dramatic play has effects in developing the cognitive skills significantly in terms of problem solving and creativity but doesn't have a significant effect on decision making skills. On the other hand, games and rules seem to have significant effects on decision making and creativity, but has no significant effect on problem solving skills.

The importance of physical education for the human brain is so evident, and necessary for the human life improvement. physical education is the children's favorite class and they adore their Physical Education teacher. Although public preschools encourage physical education and they assign P.E. teachers and assistants for each preschool and have two 40- minute periods a week, private schools seem to have some advantages compared to public preschools.

Based on the observation sessions, it is clear that private preschools are more active in outdoor play than public schools. Outdoor playgrounds should contain various collections of play materials and instruments that will enrich the child's play experiences. Although the playgrounds and outdoor play areas differed substantially from one preschool to another, the outdoor playgrounds in the private preschools are mostly well equipped with a variety of playing materials including sand and water equipment bicycles, tricycles, swimming pool, playground, racing equipment and football pitch. Some playgrounds have opportunities for large motor play on slides, poles, etc. public preschools, on the other hand, had poorly equipped outdoor environment and playground.

Teachers in public schools prefer to use indoor playgrounds and activities for many reasons. First, they think that Indoor play is usually safer, and it is easier to watch children. When outdoors, it is easier for children to get hurt than when they are in indoors. One of the most important challenges is the parents' negative reactions related to fears about children getting sick, dirty or injured.

The indoor environments in both public and private preschools were organized into learning centers and included areas such as: art, blocks, dramatic play, manipulatives, and library. The indoor environments varied greatly in size, materials available, and organization. The indoor environments had many more materials that were not available outdoors the playgrounds and outdoor play areas differed substantially from one preschool to another. I suggest that parent teachers encourage their children to engage in play activities that develop their cognitive skills.

It is suggested that parents and teachers should engage their children in a variety of meaningful play activities and provide them with appropriate toys and games to improve their cognitive skills. Preschool teachers should focus the four cognitive play types mentioned in this study. These skills must be provided at school and home to develop children' cognitive skills and attain better cognitive development. Play activities should be experiencing different types of play to stimulate learning in play.

Future research may be conducted to attain further detailed information on some other aspects of play practices and find out other cognitive skills that develop the cognitive development of preschool children.

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