

Movement and Play Behaviors of Egyptian Children After Covid-19 Pandemic Restrictions: Cross-Sectional Study

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ABSTRACT

Background: Children's everyday lives had undergone substantial alterations due to the COVID-19 epidemic. Children's insufficient physical exercise and excessive sedentary behavior are serious issues.

Objective: To investigate the effects of COVID-19 limits on children's play and movement habits in Egypt.

Methods: A cross-sectional sample of 400 Egyptian children aged 5-14 years. The Arabic version of the online outbreak survey was used to evaluate children's movement and play behavior before and during the COVID-19 epidemic. Data analysis included descriptive statistics and test-retest reliability.

Results: By comparing the collected data with WHO guidelines, it was found that 2.3% of screened children fulfilled the 24-hour combined movement behavior criteria; 57% met sleep recommendations; 36.9% met moderate-to-vigorous physical activity guidelines, and 12.3% met screen-time guidelines. During the epidemic, children in Egypt had decreased physical activity levels, more sluggish habits, and less sleep. The Arabic version of the survey showed excellent reliability.

Conclusion: The COVID-19 epidemic restrictions had a bad impact on Egyptian children's play and movement patterns. Future initiatives to safeguard and advance child health should be considered.

Keywords: Children, COVID-19 restrictions, Outbreak survey, Physical activity, Play, and movement behavior.

INTRODUCTION

The World Health Organization (WHO) professed COVID-19 as a worldwide pandemic in 2020. Corona virus produced severe respiratory distress in people and is spread by contact and respiratory droplets⁽¹⁾. Children's everyday lives have been influenced significantly as a consequence of the COVID-19 epidemic, with different recommendations and limitations in different nations⁽²⁾. Children who engage in insufficient physical activity (PA) and excessive sedentary behavior (SB) are at hazard of major health disorders including obesity and type II diabetes in later childhood and adulthood⁽³⁾.

Healthy movement practices improved children's physical and mental wellbeing⁽⁴⁾. Numerous nations as Canada⁽⁵⁾ and Australia⁽⁶⁾, and also the WHO⁽⁷⁾, support the benefits of movement patterns for healthy development and growth; they published 24-hour combined movement behavior instructions for children. The WHO recommended that children engage in 1 hour of daily moderate to vigorous physical activity (MVPA) 3 days/week, 1-2 hours of daily light physical activity (LPA), no more than 2 hours/day of average screen time, and 9 to 11 hours/night of average sleep⁽⁴⁾. Compared to their less active classmates, children who fulfilled activity recommendations had a higher immunological function, cardio-metabolic, musculoskeletal, cognitive, and emotional health^(4,5,7).

Egypt declared the first verified instance on February 14th and put COVID-19 limitations (such as physical distancing, limited community and social gatherings, shutting schools and parks, and the nullification of sports/activity classes). Children were unable to reach the required PA levels as a result⁽⁸⁾.

Children's everyday life had altered as a result of the COVID-19 epidemic in Egypt, but it was unclear to what degree these changes had affected their capacity to play and adhere to movement behavior standards. This study aimed to investigate how children's play and movement patterns changed during the COVID-19 epidemic throughout Egypt.

SUBJECTS AND METHODS

Study design and population:

A cross-sectional study was used. Parents of 475 Egyptian children of both sexes participated according to these inclusion criteria: normal healthy children aged from 5-14 years residing in Egypt. Children were excluded if they were diagnosed with COVID-19 or any type of disability.

Sample size calculation:

The sample size was calculated using the Krejcie and Morgan Table. For a population of greater than ≥ 100 million, it was estimated that a sample of 384 participants would achieve a confidence level (level of assurance) of 95% with an error margin of 5%⁽⁹⁾.

METHODS:

Ethical consent:

The Faculty of Physical Therapy at Cairo University's ethics committee gave its approval to the study's procedure (P.T.REC/003485). Every patient signed informed written consent for the acceptance of participation in the study. This work has been carried out following the Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Measure:

The translated reliable *Children & Youth Movement and Play Behavior Survey* ^(4, 5, 10) was used to evaluate children's movement and play behavior. It includes 4 areas: parental and child demographics; present movement and play behaviors; its changes; and parental support for their children's movement and plays patterns. The survey aimed to determine changes that happened in children's movement behaviors during the COVID-19 outbreak and how parents supported their children during that period to promote their PA. A 5-point Likert scale was used to grade the responses as 1 being "a lot less", 3 being "no difference" and 5 being "a lot more".

Survey Development:

Translation and cross-cultural adaptation guidelines⁽¹¹⁾ were followed, which included: 1) Forward translation by translating the Children & Youth Movement and Play Behavior's Survey from the original English language to Arabic Egyptian dialect by 2 independent Egyptian translators. 2) Reconciliation to merge both Arabic translations into one version. 3) The merged version was translated again back to English. 4) Review the backward translation. 5) Cognitive debriefing through pilot testing of the Arabic version of the survey on 10 parents to assess its comprehensibility. 6) Review debriefing results and finalization through the interpretation of the obtained results from pilot testing and checking for any misconceptions. 7) Proofreading for the final revision of the Arabic translation to check for any errors before writing a final report to document the translation process.

Data Collection:

Eligible participants completed a 20-30 min online Arabic-adapted version of the outbreak survey. They were considered to consent to participate in the survey by signing up for the online Google link. Participants supplied demographic data for themselves and their children. They also assessed their children's movement activities before and after the COVID-19 epidemic. Participants also stated how they supported their child's activity habits during the COVID-19 epidemic. Following data gathering, investigators further cleaned and verified the data following the standards of *Terwee et al.*⁽¹²⁾.

Statistical Analysis

Descriptive data analysis including mean, standard deviation, and percentiles were calculated to determine the score distributions. Correlation analysis was conducted to assess relationships between play and movement behaviors and demographic and parenting characteristics (Pearson and point biserial correlation coefficient). Test-retest reliability was measured by re-administering the same survey within 1-2 weeks on a sample of 100 parents. The level of statistical significance was chosen at $p=0.01$. The statistical analysis application SPSS version 25.00

(IBM Corporation, Illinois, USA) was used for all calculations.

RESULTS

Parent and Child Characteristics:

A total of 475 parents completed the survey. Respondents of children with COVID-19 ($n=57$) and disabled children ($n=23$), i.e., 5 common disabled children had COVID-19. The total number was excluded from the analyses ($n=75$). The final sample included 400 participants. Descriptive statistics for eligible parent characteristics; a total of 400 eligible parents filled the survey. Respondent parents' age was variable with a mean of 35.57 years, and a range of 21–57 years, they were primarily females (87.25%), married (95%), college or university graduates (72.25%), and working full-time (81%). Most of the families (89.25%) followed the quarantine restrictions.

As for the demographics of the children ($n=400$); for starters, ages ranged from 5-14 years with a mean of 8.08 ± 2.948 years, most children were primarily boys (59.75%), most children were the firstborn of their families (66.25%) and most of the families had 2-3 children (72%). Most families lived in an intermediate-level residence (Apartment/Townhouse) (83.5%), and (3.25%) reported having a dog. The current health behavior among Egyptian children shows that about one-third of them were meeting MVPA recommendations ($n=147$, 36.9%), about two-thirds of them were meeting LPA recommendations ($n=241$, 60.4%), only a minority of them were meeting screen time recommendations ($n=49$, 12.3%) and more than half of them were meeting sleep recommendations ($n=228$, 57%). Finally, only a few of them ($n=9$, 2.3%) followed the combined 24-h movement behavior recommendations, (PA, screen time, sleep).

Table 1 provides a summary of the children's play and movement patterns as of right now and how long they had been changed through time by age and gender. Older children (39.1%) met the MVPA recommendations more than younger children (35.8%). Younger children participated in less recreation screen-time (4.83h/day) compared with older children (6.27h/day). Only a small percent of them met the combined 24-h criteria (2.5% of younger children, 1.7% of older children). Girls in both age groups engaged in less MVPA compared with boys, younger children (30% girls, 39.9% boys), and older children (38.6% girls, 39.4% boys). Younger children met the screen time guidelines much higher than older children (15.4%, 4.3% respectively). On the other hand, older children met the sleep guidelines more than the younger children (61.7%, and 55.1% respectively). In the LPA the younger children engaged and met the guidelines more than older children (66%, 46.1% respectively).

Table (1): An overview of the current movement and play behaviors in children and percentage meeting guidelines by age and gender

		Young children (5-9years)			Older children (10-14years)		
		Total (n=285)	Girls (n=117)	Boys (n=168)	Total (n=115)	Girls (n=44)	Boys (n=71)
Current child health behavior, M(SD)	MVPA (≥1h/day, 3days/week)	2.08(1.887)	1.74(1.651)	2.32(2.006)	1.96(1.703)	1.82(1.702)	2.04(1.703)
	LPA (≥1h/day, 3days/week)	3.71(2.319)	3.74(2.433)	3.69(2.243)	2.72(2.122)	2.7(2.064)	2.73(2.171)
	Screen time (≤2 h /day)	4.83(2.098)	4.61(2.240)	4.98(1.986)	6.27(1.925)	6.20(2.174)	6.31(1.770)
	Sleep (9-11 h/day)	9.9(1.688)	9.85(1.728)	9.93(1.664)	9.86(1.726)	10.30(2.075)	9.59(1.420)
The proportion of children meeting guidelines (%)	MVPA (≥1h/day, 3days/week)	102(35.8%)	35(30%)	67(39.9%)	45(39.1%)	17(38.6%)	28(39.4%)
	LPA (≥1h/day, 3days/week)	188(66%)	77(65.8%)	111(66.1%)	53(46.1%)	22(50%)	31(43.7%)
	Screen time (≤2h/day)	44(15.4%)	26(22.2%)	18(10.7%)	5(4.3%)	4(9.1%)	1(1.4%)
	Sleep(9-11 h/day)	157(55.1%)	56(47.9%)	101(60.1%)	71(61.7%)	31(70.5%)	40(56.3%)
	24h combined	7(2.5%)	3(2.6%)	4(2.4%)	2(1.7%)	2(4.5%)	0%

MVPA=moderate to vigorous physical activity, LPA=light physical activity.

Parents reported changes in their children's play and movement behaviors, and a summary of those changes showed in **Figure 1** and **Table 2** respectively.

As for the Egyptian children, parents reported a decline in some PA related to home contrasted before the COVID-19 outbreak (PA or sport inside 2.94, household chores 2.81 and plays inside 2.89). Whereas they also reported an increase in other PA-related outdoors contrasted before to the COVID-19 outbreak (walks or bikes in neighborhood 3.22, PA or sports outside 3.44 and plays outside 3.35). It was noticed that younger children were reported to play more than older children, whereas older children were reported to be more active in the rest (walks or bikes in neighborhood 3.32, PA/sport outside 3.54, PA/sport inside 3.01 and household chores 2.83). It was also reported that girls were superior

in household chores and boys were superior in the rest of PA.

On the contrary, leisure screen time and social media use by Egyptian children were reported to be greater than it was before the COVID-19 outbreak (screen time 3.63 and social media use 3.68). Sleep time was reported to be slightly declined than before COVID-19 (sleep time 2.84). It was noticed that there were small variations by gender and age. Overall, parents reported more overall time spent outside than before COVID-19 (overall time spent outside 3.34), where this was highest in families with older girls (3.48). Parents also reported more family time in SB (3.67), where this was highest in families with older boys (3.89). On the contrary, parents reported a decline in family time spent in PA (2.28), where this was lowest in families with older girls aged (2.16).

Table (2): A brief analysis of the change in movement and play behaviors of children during the COVID-19 pandemic by age and gender (mean)

		Children			Young children (5-9 years)			Older children (10-14 years)		
		Total (n=400)	Girls (n=161)	Boys (n=239)	Total (n=285)	Girls (n=117)	Boys (n=168)	Total (n=115)	Girls (n=44)	Boys (n=71)
Physical activity	Walks or bikes in the neighborhood	3.22	3.05	3.33	3.17	2.95	3.33	3.32	3.32	3.32
	Physical activity/sport outside	3.44	3.18	3.62	3.40	3.17	3.56	3.54	3.20	3.75
	Physical activity/sport inside	2.94	2.94	2.94	2.91	2.92	2.90	3.01	2.98	3.03
	Household chores	2.81	2.90	2.74	2.79	2.89	2.73	2.83	2.93	2.77
	Plays outside	3.35	3.32	3.36	3.41	3.36	3.44	3.19	3.20	3.18
	Plays inside	2.89	2.86	2.91	2.9	2.91	2.97	2.76	2.73	2.77
Sedentary behavior	Watches TV or screens	3.63	3.68	3.60	3.70	3.70	3.70	3.46	3.61	3.37
	Uses social media	3.68	3.66	3.69	3.74	3.66	3.80	3.53	3.68	3.44
Sleep	Sleep time	2.84	2.86	2.83	2.87	2.91	2.84	2.77	2.73	2.80
	Sleep Quality	3.33	3.32	3.34	3.29	3.31	3.27	3.43	3.34	3.49
Overall	Overall healthy movement behaviors	3.00	2.99	3.00	2.96	2.97	2.96	3.08	3.05	3.10
	Overall time spent outside	3.34	3.36	3.32	3.35	3.32	3.38	3.30	3.48	3.18
	Family time in physical activity	2.28	2.30	2.26	2.31	2.36	2.28	2.20	2.16	2.23
	Family time in sedentary behaviors	3.67	3.59	3.72	3.62	3.58	3.64	3.78	3.61	3.89

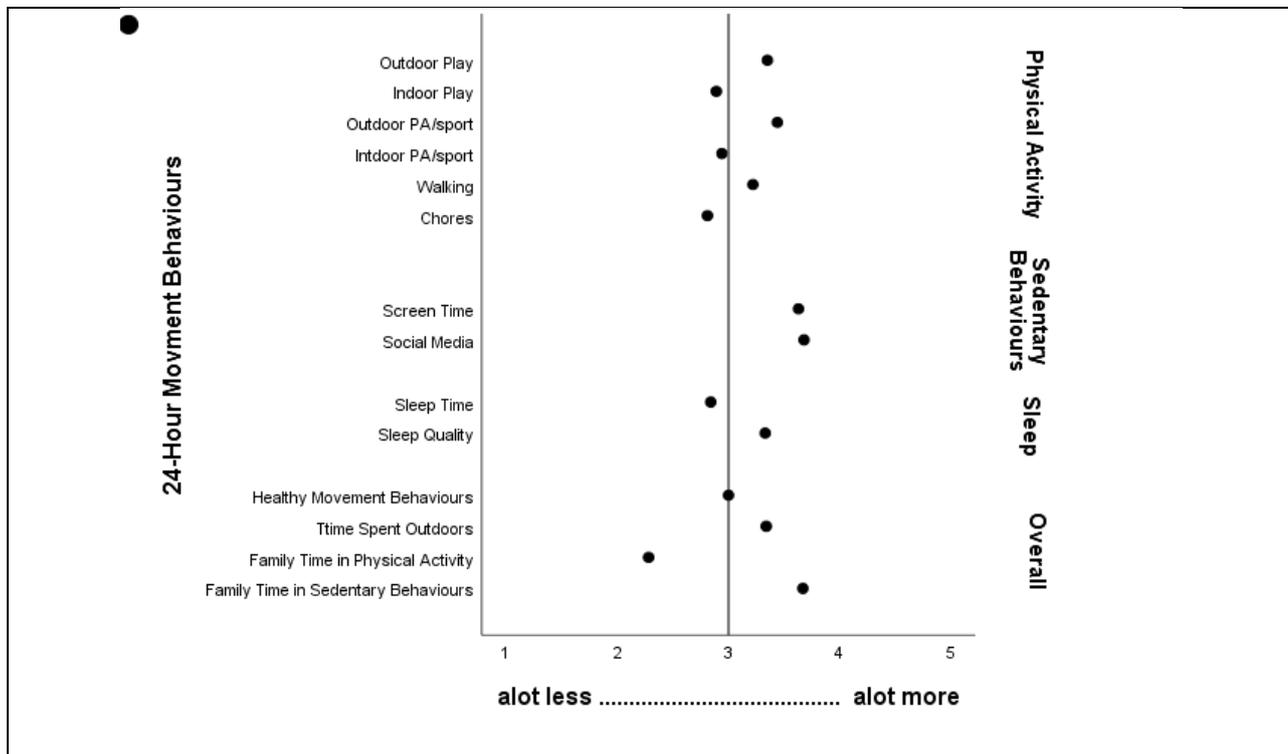


Figure (1): Forest plot represented changes in Egyptian children's 24-h combined movement behaviors.

Parental support/encouragement of child movement and play behaviors:

Several associations were performed between the perceived changes in the Egyptian children's movement and play behaviors with parental demographics, and social and environmental factors (Table 3). A younger parent was linked to the child spending more time riding or walking around the neighborhood (0.127). A male parent was associated with the child having more time for outside PA (0.117), more overall time outdoor (0.117), more family time in SB (0.111), more screen time (0.125), more social media time (0.152) and more sleep quality (0.123). Whereas a female parent was associated with the child having more time for inside play (0.118) and family PA (0.1). Having a high household income was associated with the child

having more social media time (0.105). Living at a high household level (house) was associated with the child having more family SB (0.105). Owing a dog was associated with the child having more family SB (0.1). Parents' encouragement was associated with the child having more outside PA (0.172), more walking/biking in the neighborhood (0.140), more outside play (0.265), more overall time outdoor (0.288), and more family PA (0.126). Parent's participation was associated with the child having more outside PA (0.149), more outside play (0.145), more overall time outside (0.185), and more family PA (0.180). Parent's support was associated with the child having more family PA (0.226). Parents' discouragement of screen time was associated with the child having more family PA (0.245).

Table (3): Demographic, social, and environmental determinants and reported changes in movement behaviors

	Physical activity						Overall			Sedentary behavior		Sleep	
	Outside Physical activity	Walking and biking	Outside play	Inside physical activity	Household chores	Inside play	Overall time outdoors	Family physical activity	Family Sedentary behavior	Screen time	Social media	Sleep time	Sleep Quality
Parent's age	.093	.127*	-.051	.080	-.055	.058	.026	-.003	.043	-.024	-.036	-.053	.087
Parent's gender	.117*	.060	.085	-.033	.019	-.118*	.117*	-.100*	.111*	.125*	.152**	.064	.123*
Parent's education	-.061	-.051	-.045	-.069	-.039	-.066	.050	.033	.001	-.014	.018	.078	-.020
Parent's work status	.063	-.035	.006	.008	.064	-.094	.063	.022	.044	.017	.047	-.071	.053
Household income	-.049	-.042	-.006	-.124*	.002	.043	-.032	-.050	.027	.091	.105*	-.103*	.006
Marital status	.018	-.011	.019	-.009	.040	.013	.002	.046	-.046	.021	.004	.030	-.053
Household type	-.088	-.097	-.012	-.001	.058	.075	.054	-.120*	.105*	-.012	.074	-.077	.015
Dog ownership	-.003	.070	-.017	.093	.042	-.046	-.035	-.043	.100*	-.009	.058	.016	-.067
Parent encourages physical activity	.172**	.140**	.265**	.094	.010	-.088	.288**	.126*	.110*	.128*	.055	.012	.041
Parent Participates In physical activity	.149**	.075	.145**	.074	.017	-.011	.185**	.180**	-.024	-.028	.028	.028	.001
Parent supports physical activity	.074	-.063	-.014	.051	-.111*	-.013	.012	.226**	-.020	-.120*	-.023	.052	-.079
Parent discourages screen time	-.039	-.063	-.081	-.025	-.101*	.084	-.002	.245**	-.071	-.127*	-.102*	.055	-.092
Parent encourages sleep	.037	.088	.050	.083	.000	.068	.078	.044	.098	.006	.030	-.022	.040

Correlation is significant at the 0.05 level (2-tailed) * / Correlation is significant at the 0.01 level (2-tailed) **
 Correlation values of 0.40 or above were considered satisfactory ($r \geq 0.81-1.0$ as excellent, $0.61-0.80$ very good, $0.41-0.60$ good, $0.21-0.40$ fair, and $0-0.20$ poor) Terwee et al. (12).

New creative techniques families are approaching for movement behaviors:

Some families attempted to improve the movement and play behaviors of their children as a deterrent against COVID-19 implications.

A third of parents (33.5%) said their child was engaging in a lot more indoor activities at home, while just 14.8% said their child was engaging in more outside activities at home. Among the respondents (134 responses), a variety of inside-home hobbies/activities were reported to be done more. They were grouped into either screen-based 32.75% (e.g., phone, tablet, television (TV), and video games) or active hobbies 67.25% (e.g., home sports, arts, crafts, puzzles, and games). They were sub-grouped into arts and crafts (36.6%), video games (17.2%), puzzles and games (16.4%), reading and online courses (15.7%), and home sports (14.2%). Among the respondents (59 responses), a variety of outside home hobbies/activities were reported to be done more. They were grouped into sports activities 67.8% (e.g., Swimming, Football, Karate, and Gymnastics) or walking/biking around neighborhood streets (32.2%). As a result of the COVID-19 pandemic, new family hobbies or activities were also recorded (76 responses). Among them were walking/physical exercise (34%), drawing and planting activities (25%), reading and religious activities (24%), and chess/card games (17%). Only a small percentage of families (16.5%) said they used internet tools or applications to encourage healthy activity habits (66 responses, e.g., YouTube, aerobic workout exercise applications, and fitness applications).

Families also reflected on their experience with COVID-19. It was reported that families experienced distress with a mean of 5.75 ± 2.892 COVID-19 outbreak. Some families also reported a decline in children's health status (63 responses, e.g., general debility/laziness 47.6%, weight gain 28.6%, increase anxiety/aggressive behaviors 19%, and eyesight problems related to increasing screen time 4.8%). During the COVID-19 epidemic, several families (21.3%, 85 replies) offered society suggestions on how to balance children's movement habits (PA, screen time, and sleep).

Survey Reliability:

Test-retest Reliability:

For the Arabic version of the survey, test re-test reliability for most question scores showed excellent reliability over 1–2-week period (current movement behaviors questions: $ICC \geq 0.84$, change in movement and play behaviors questions: $ICC \geq 0.80$, questions comparing the current status with before: $ICC \geq 0.74$).

DISCUSSION

The purpose of this study was to investigate how the movement and play behaviors of Egyptian children were affected by COVID-19 restrictions.

Evaluation of the sudden change in PA, play, SB, screen time, and sleep among school-aged children (ages 5 to 14) across Egypt during the COVID-19 crisis was used. In comparison to before COVID-19 restrictions, it was found that Egyptian children spent more time playing outside, were more sedentary, and were more engaged in leisurely screen-based activities.

Age and gender-related variations were obvious. In general, younger children had more time for play activities, engaged in more screen time and social media use, and slept more whereas older children were more physically active in walking or sports activity. This can be attributed to younger children being restricted to staying at home thus having more time for play, screen time, and sleep. Girls were more active than boys only in household chores. Girls in the same age group (10–14 years) used social media more frequently than boys, although girls in the same age group (5–9 years) used it less frequently. Boys slept more than girls did. This is explained by the feminine nature.

The largest reported change in behaviors of Egyptian children was in leisure screen-based activities, as they were watching about 5 to 6.5 h/day. The second noticeable change was related to PA, where children were performing less MVPA of about 2 days/week. As for the sleep behavior, children slept around 10 h/day which was mostly meeting WHO guidelines. The last change was related to the 24-h combined movement behavior where the children who met the WHO guidelines were only about 2.3%.

The increase in mean screen time and the reduction of mean MVPA have disrupted the 24-h combined movement behavior profile. All of these things corroborate the theories that COVID-associated constraints are adversely influencing children's related movement and play behaviors.

Using the survey; the Egyptian children had lower MVPA, higher sleep time, and lower screen time when compared to the Canadian children and youth⁽¹⁰⁾. This suggests a lower level of PA/physical fitness/sports activity among the Egyptian population and an elevated SB/screen time/social media use. Reduction of PA and prolonged SB were related to loss of muscular strength, loss of cardiorespiratory endurance, increased weight, psychosocial problems, and improper academic achievements⁽¹³⁾.

The prevalence of children who followed the 24 combined movement and health behavior guidelines was low in our sample (2.3% for children), this is in accordance with that of the Canadian population (4.8%)⁽¹⁰⁾. These indicate a decline in the Egyptian children who adhered to these recommendations during the COVID-19 pandemic.

In Egyptian children during the COVID-19 epidemic, our results were in accordance with multiple studies; **Mekkawy**⁽¹⁴⁾ found that throughout the lockdown 58.9% of the children reported weight gain,

64.6% had declined PA, 86.9% with higher consumption time on the computer/TV/mobile, and 54.7% reported sleeping difficulties. **Khairy et al.**⁽¹⁵⁾ reported that increased body mass index and body weight was associated with reduced PA level in school-aged children. **Nassar et al.**⁽¹⁶⁾ reported that $\geq 50\%$ gained weight and had reduced quality of life during COVID-19 lockdown especially those with reduced PA at home. **Hashem et al.**⁽¹⁷⁾ reported changes in children's eating behaviors where 31.8% showed higher appetite, 45.6% showed higher sweets/unhealthy food consumption, 37.6% reported higher frequent between-meals snacks and 53.1% reported higher snacks during late night. It was reported that 82% showed eating behavior alteration with boredom and 94.6% showed higher engagement in electronics/screen-time. **El Refay et al.**⁽¹⁸⁾ reported that 65.6% of the children had symptoms of sleep problems. Participants who most frequently experienced issues with starting and staying asleep were 33.4% while 15.7% had excessive somnolence. According to **Araby et al.**⁽¹⁹⁾, 96.4 % experienced changes in their sleeping habits, 77.8 % experienced changes in their eating habits, 70.5 % experienced changes in their mood and behavior, particularly anger, and 37.3 % experienced difficulties concentrating and focusing. **Abokresha et al.**⁽²⁰⁾ reported that 60% of children in Egypt had moderate to severe psychological affection during the COVID-19 pandemic.

Based on these findings, effective multiple strategies are needed to help in weight control/eating behaviors, improve outdoor/indoor PA, reduce SB/screen time and improve the quality of life/psychological status to protect Egyptian children from the negative effect of the COVID-19 pandemic. A child who is deprived of enjoying his usual life is more likely to experience physical and mental health issues⁽²¹⁾.

Several associations were performed between the perceived changes in the movement and play behaviors of Egyptian children with parental demographics, and social and environmental factors. Several factors helped promote PA and sleep whereas others helped reduce time spent in screen-based/SB. These factors have not been uniform for all Egyptian children. Multiple factors were associated with the promotion of PA in children; being a younger parent, being a male parent, parents' encouragement of PA, parents' participation, parents' support of PA, and parents' discouragement of screen time. Other factors were associated with increased SB in children; having a high household income, living in a high household level (house), owning a dog, poor parents' support of PA, and poor parents' discouragement of screen time.

Some Egyptian parents had created ways to adapt to COVID-19 restrictions. Respondents to this study identified several creative techniques to make the most of their free time in the open-ended questions.

Most families (67.2%) were reconnecting through active hobbies. Other families (32.8%) were reuniting by engaging in sedentary screen-based activities. Making time for family recreation and taking up new interests and hobbies might be beneficial tactics to lessen the mental health issues (such as sadness, anxiety, and aggressive behavior) that lockdown situations are aggravating^(19, 20). Families in Egypt should think about developing a more active lifestyle.

A multitude of activities e.g.: sport-related PA (inside/outside home) plus play-related activities (inside/outside home) plus walking or biking outdoors or doing household chores, is the ideal setup for healthy behavior to prevent the negative effects of COVID-19 quarantine-related restrictions and social distancing measures. Increased PA was associated with multiple health signs in cardiometabolic endurance, motor skill development, bone density preservation, and emotional and psychological health regulation for children and adolescents⁽²²⁾.

Interventions to reduce the number of time children spent on (TV/mobile/tablet/video games...etc) should incorporate physical exercise. Engagement in PA and reduction of screen-based activities will help control and minimize weight gain, promote healthy eating patterns and give the child proper time for restful sleep^(17, 18). There was a positive correlation between increased screen time and increased sleep disturbances and anxiety⁽¹⁸⁾. Increased screen time (on smartphones, laptops, and video gaming) was significantly correlated with increased appetite, unhealthy food consumption, increased sweets consumption, a disregard for eating fruits and vegetables, a reduction in protein serving intake, frequent between-meal snacking, and late-night snacking⁽¹⁷⁾.

Families also reported distress and anxiety during the COVID-19 pandemic. Some families also reported a decline in children's health status (laziness and debility, weight gain, increase in anxiety and aggressive behaviors, eyesight problems related to increasing screen time). This is in accordance with other studies conducted in Egypt that reported weight gain^(14, 15, 16) and anxiety and aggressive behaviors during the COVID-19 pandemic^(19, 20).

The Arabic version of the survey was adapted according to the international guidelines and its reliability was strong; that ensures no loss of data and the timing of data collection was ideal as it was used during the application of COVID-19 restrictions.

This study incorporates some limitations. The study was conducted through electronic Google form which might limit the variety in population cultural/socioeconomic levels. The Arabic version of the survey couldn't be validated because no specific gold standards in Arabic were available. It would be advantageous to conduct a future study on a larger sample size to be more representative and to identify rural versus urban community differences.

CONCLUSION

The COVID-19 pandemic restrictions harmed Egyptian children's play and movement patterns. Future initiatives to safeguard and advance child health should be considered.

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