The Prevalence of Toddlers at Risk for Developmental Delay during the Covid-19 Pandemic in the National Capital Region, Philippines: A Single Tertiary Hospital Study

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ABSTRACT

Background. With the COVID-19 lockdown restrictions, toddlers had significantly reduced environmental stimulus, leading to missed opportunities for learning and play, evidenced by declining developmental assessment scores.

Objectives. This was the first study in the Philippines to describe the prevalence of toddlers at risk for developmental delay during the COVID-19 pandemic. Using the Early Childhood Care and Development (ECCD) Checklist, factors correlated with increased risk of developmental delay were identified.

Methods. A descriptive cross sectional study was done among toddlers aged 12 to 36 months. The ECCD Checklist was administered to determine the children's risk of developmental delay. Chi-square and Multiple Logistic Regression were used to identify factors correlated with risk of developmental delay.

Results. 145 toddlers (μ=25.28±7.078 months) were included in the study, and among which, 25.5% (n=145) were noted to be at risk for delays in one or more developmental domains, with prevalence odds increased by two-fold among those with daily screen time of an hour or longer (p=0.033, OR=3.055). It was also found that 73.1% (n=145) of toddlers had daily screen time of an hour or longer, contrary to AAP recommendations.

Conclusion. During the COVID-19 pandemic, more toddlers were found to be at risk for developmental delay, with prevalence odds increased with longer screen time. Findings may guide educational sectors in formulating interventions to prevent developmental delays as the country moves through the new normal.

Keywords: *development, school, Filipino, toddlers, COVID-19 pandemic*

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INTRODUCTION

Development during the first three years of life is crucial as synapses are formed at a faster rate during these years, allowing the brain to be especially responsive to external input. This provides for a more efficient way for the child to achieve optimal development cognitively, physically and socially.[1] Also, development during early childhood has been established to be predictive of further development of more complex skills later in childhood.[2]

With the start of the COVID-19 pandemic, lockdowns and quarantine restrictions were put in place, limiting the available stimulus that would have ideally helped better facilitate cognitive, social and motor development during the toddler years. In line with this, studies found that cognitive assessment scores measured during the pandemic among children below five years of age were significantly lower, which in these studies suggest correlation with less face to face interactions and more time on social media as a consequence being in lockdown.[3,4] There were also studies noting lower scores in gross and fine motor skills among children with more screen time.5 In addition, other studies also described the negative impact of COVID-19 restrictions on social and emotional well-being, with children unable to experience social interaction with same-age peers, resulting to increased anxiety, clinginess, tantrums, and under-stimulation.[6]

In contrast, there were studies with contradicting findings which identified screen time to be positively correlated with better receptive as well as expressive language skills among toddlers.[7,5]

Rationale of the study

All these studies highlighted the situation of early childhood development in countries worldwide during the COVID-19 Pandemic. None of it investigated the status of development among toddlers in the Philippines, where one of the longest COVID-19 lockdowns in the world was in put in place. With this, our study aimed to describe the prevalence of the risk for developmental delay among toddlers aged 12 to 36 months during the COVID-19 pandemic, using the Early Childhood Care and Development (ECCD) Checklist. This thus provided a baseline data for early childhood development in the Philippines during the pandemic while also identifying factors correlated with increased risk for developmental delay.

The findings of the study was intended to serve as a guide for educational institutions as they formulate interventions that would help prevent developmental delays given the new setup adopted in lieu of the pandemic (i.e., online classes, hybrid school setup). All this to help children adapt better as the country moves through the new normal.

OPERATIONAL DEFINITIONS

Toddlers: Children aged 12 months and 0 days to 36 months and 365 days.

Participants: The child being evaluated for his or her cognitive, motor and social development during the COVID-19 Pandemic.

Respondents: Parents/ caregivers of the child being evaluated. He or she accomplished the ECCE Checklist, basing his or her answers on whether the participant is able to perform the items in the survey questionnaire.

Risk for developmental delay: A child who acquired a Scaled score of ≤6 on the Early Childhood Care and Development Checklist was considered at risk for developmental delays, and was advised to re-test after 3 to 6 months or seek consultation with a Developmental Pediatrician for further evaluation.

Average development: A child who acquired a Scaled score of ≥7 on the Early Childhood Care and Development Checklist was considered to average and advanced child development. In particular, a Scaled score of 7 to 13 was

considered to have average development, while a Scaled score between 14 to 19 was considered to have advanced development.

Cognitive development: Development of a child's ability to think, reason, use language, communicate, solve problems, and learn. This was measured using the items on Receptive Language, Expressive Language and Cognitive Development in the ECCD Checklist.

Motor development: Includes both gross motor development, including skills requiring coordination of large muscle groups; as well as fine motor development, including skills requiring coordination of smaller muscles of the body, such as the hands and face. This was measured using the items on Gross Motor and Fine Motor Development in the ECCD Checklist.

Social development: Development of children's relation to their social world and their ability to differentiate and express emotions and perceive emotional states of other individuals. This was measured using the items on Social Development in the ECCD Checklist.

Early Childhood Care and Development (ECCD) Checklist: A testing tool used to assess if a child is developing at par with age, or is at risk for developmental delays. It was designed by the National Nutrition Council of the Philippines to be administered in the community by teachers, child development workers, day care workers, parents and caregivers.

Duration of daily screen time: The amount of time the child spent watching any kind of video on the television or on other gadgets. Sample contents include, but are not limited to, the following: Educational materials that teach about letters, doodling, object identification, shapes, colors; and sing-along music videos. For the purposes of this study, this was divided into: <1 hour; ≥1 hour.

Duration of daily physical activities: The amount of time the child spent on activities that require movement of the extremities and facilitate energy expenditure. Sample activities include, but are not limited to, the following: Walking, running, climb stairs, climbing. For the purposes of this study, this was divided into: <1 hour; ≥1 hour.

Duration of daily informal study: The amount of time the child spent on informal study activities without gadget use.

Sample activities include, but are not limited to, the following: Being read to, doodling. For the purposes of this study, this was divided into: <1 hour; ≥1 hour.

METHODS

Type of Study, Time Period and Target Population

This research utilized a cross sectional study design to describe the prevalence of toddlers at risk for developmental delay, among Social Service and private patients of pediatric consultants from a Tertiary Hospital in Quezon City, during the period of March 2020 to March 2022 (within the timeframe of the COVID-19 pandemic). This study also determined the factors associated with the risk for developmental delay among this population. Children born preterm, and those diagnosed with congenital anomalies, syndromes and disorders affecting cognitive, motor and social development were excluded from the study.

Description of Study Procedure

The study utilized convenience sampling, with data conveniently collected from the available pool of respondents. The limitation of this, however, is that it is difficult to generalize the results of the study to the population as a whole because of the possibility of under- or over-representation of a certain group. As in this study for example, more private patients were able to answer the online questionnaire, as compared to the social service patients, since the private patients had more access to the internet. With this, the study might generate biased results which could have been addressed if the respondents were recruited using random sampling.

The respondents were gathered from the pool of Social Service patients, and from the private patients of pediatric consultants of a Tertiary Hospital in Quezon City. The social service patients were recruited in the form of a text blast sent by doctors assigned at the OPD. The message, which included a brief description of the purpose of the study, was sent to potential respondents (the primary caregivers of the study participants). Respondents who agreed to be part of the study were given a Google Form link to the Informed Consent Form and the Survey Questionnaire. On the other hand, the private patients were recruited through their respective attending pediatricians. A formal letter was sent to the attending pediatricians to request for their permissions to have their patients participate in the study. The letter included a description of the study, along with a request to send a text or email blast to their private patients to participate in the study. Respondents who agreed to be part of the study, were instructed to message the Study Doctor who then sent the Google Form link to the Informed Consent Form and thereafter, the Survey Form.

Informed consent was obtained from the respondents prior to inclusion in the research. An online copy of the Informed Consent Form was emailed to the respondents, which was then sent back to the Study Team with their signatures affixed prior to answering the survey questionnaire.

Caregivers of the participants were asked to complete the survey questionnaire via Google Form which included items that identified demographic data, followed by the Early Childhood Care and Development (ECCD) Checklist for children qged 12 to 36 months.

The Philippine (ECCD) Checklist is a testing tool designed to be administered by service providers (teachers, rural health midwives, child development and day care workers), and parents or caregivers, with the goal of determining whether a child is developing at par with age, or is at risk for developmental delays. This tool was not made with the intent to diagnose developmental delays and conditions, measure a child's intelligence quotient (IQ), nor gauge his academic achievement. It was designed to assess risks for developmental delays so that early interventions may be facilitated.[10] The items in the ECCD checklist are divided into seven groups based on the following domains: 1) gross motor, 2) fine motor, 3) self-help, 4) receptive language, 5) expressive language, 6) cognitive, and 7) social-emotional. These items were statistically validated among a sample size of 10,915 Filipino children from the NCR, and from Regions III, VI, VII, VIII and XII.[10]

The ECCD was available in both English and Filipino versions created and validated by the National Nutrition Council. The respondents took around 30 minutes to 1 hour to answer the whole questionnaire, and they were encouraged to contact the Study Doctor when they wished to clarify about the items in the questionnaire.

Prior to giving the respondent a copy of the tool through the questionnaire in the Google Form, it was stated in the instructions that there are no right or wrong answers, nor good or bad scores. It was also detailed that the tool will determine the risk for developmental delays but will not diagnose the participant of any developmental condition without consultation with a Developmental Pediatrician. This was stated to address possible Social Desirability Bias or bias noted when respondents give answers that are socially acceptable; and in a way, ensure more accurate responses from the respondents. To administer the questionnaire and note the responses in the Google Form, the respondent either: 1) Observed the participant; or 2) Directly elicited the behavior or response from the participant (some items directly states what the child needs to perform while others

have an accompanying instruction on how the item can be elicited from the child).[10]

Those with incomplete data were excluded from the study. Results from the ECCD were then tallied on Microsoft Excel for Mac version 16.61.1 (2019), and the respondents' raw scores were translated into scaled scores included in the ECCD Checklist which helped to compare the scores even though the children had differing ages (thus, differing anticipated milestones per age) during the time of testing.[10]

Description of Outcome Measures

The outcome was the presence of risk for developmental delays, which was measured using the ECCD Checklist. The study determined the correlation of this with the following variables: 1) Number of hours of daily physical activity; 2) Number of hours of daily screen time; and 3) Number of hours of daily informal study sessions. These independent variables were noted to be associated with increased risk of developmental delay in previous studies.

Sample Size Estimation

Sample size was calculated based on the test of hypothesis for the difference in the proportion of language developmental delay among children with less than 2 hours of screen time versus those with 2 hours and over.[5] Assuming that proportion of developmental delay among children with less than 2 hours of screen time is 45.7% and 22.6% among those with 2 hours or more5 with an αerror of 5%, power of 80%, and a one-tailed alternative hypothesis, initial sample size calculated is 51 per group or a total of 102 for 2 groups. Controlling for 4 more variables in the analysis with an additional 10% for each control variable, final sample size required is 143.

This sample size was deemed achievable given that the monthly deliveries in the Tertiary Hospital involved in the study has been consistent at 100 deliveries per month (including both private and social service deliveries) even during the start pandemic.

Data Analysis

Descriptive statistics was used to study the demographics of the data collected. Determination of factors associated with developmental delay was analyzed using Univariate and Multivariate statistics. Chi-square test and Logistic Regression were used in the Univariate Analysis. Multiple Logistic Regression was utilized in the Multivariate Analysis, and the Prevalence Odds Ratios with a 95% confidence interval were also calculated. Level of significance was set at $\alpha = 0.05$. Data was analyzed using SPSS.

Ethical Considerations

The study abided by the Principles of the Declaration of Helsinki (2013) and was conducted along the Guidelines of the International Conference on Harmonization-Good Clinical Practice (ICH-GCP). The Clinical Protocol and all relevant documents were reviewed and approved by the Institutional Ethics Review Committee. The data was gathered from the medical records and only the investigator was allowed to view the patient's files. Patient confidentiality was respected by ensuring anonymity of patient records. Each patient document was CODED and did not contain any identifying information in order to ensure confidentiality.

All study data were recorded and investigators were responsible for the integrity of the data i.e., accuracy, completeness, legibility, originality, timeliness and consistency. The manner of disseminating and communicating the study results guaranteed the protection of the confidentiality of patient's data. An Informed Consent was obtained prior to inclusion of the participant in the study.[11]

By participating in the study, benefits included screening of the participants' risk for developmental delays, whether it be in the cognitive, motor or social domain. In such cases that a risk for delay was identified, the Study Doctor informs the respondent regarding the participant's results so as to facilitate follow up consultation with a Developmental Pediatrician. Possible inconveniences of participating in the study included the lengthiness of the questionnaire.

The principal investigator was the main person responsible for storage of data. All study-related documents such as all versions of the protocol, ethical clearance, data collection forms, and hard copies of source documents, signed informed consent forms shall be kept and stored by the Principal Investigator in strict confidentiality for at least 5 years after which they will be shredded. Data in electronic form will be stored in the project leader's personal laptop, which is password protected and will only be accessible to members of the study team. Hard copies of all documents will be stored in a cabinet with lock and key, in a secure room, accessible only to members of the research team.

RESULTS

The study included 145 participants aged 12 to 36 months who are either part of the Social Service Program or are private patients of pediatric consultants from a Tertiary Hospital in Quezon City, during the period of March 2020 to March 2022 (within the timeframe of the COVID-19 pandemic). Eligible participants were classified as either 1) At risk for developmental delay; or 2) With average development, based on their scaled scores in the ECCD Checklist individually accomplished by their caregivers. Baseline demographic characteristics of the study participants were tallied and are presented in Tables 1-3.

Majority of the study participants were males (77, 51.7%), with a mean age of 25.28 months. In terms of their physical activities during the period of March 2020 to March 2022, most of the participants had ≥1 hour of daily physical activity at 93.1% (135, n=145) despite lockdown restrictions. However, in terms of screen time, most of the participants at 73.1% (106, n=145) had ≥1 hour of screen time daily, which entails watching any kind of video on the television or on other gadgets; and in terms of informal study sessions, most of the participants at 61.4% (89, n=145) had <1 hour of informal study sessions daily which entails spending time on informal study activities without gadget use (Table 1).

Table 1. Demographic Data of the Sample

Age (mo) Mean 25.28, Range 12-36

Profile, n=145	n (%)
Sex	
Male	75 (51.7)
Female	70 (48.3)
No. of Hrs of Daily Physical Activity	
<1 hour	10 (6.9)
≥1 hour	135 (93.1)
No. of Hrs of Daily Screen Time	
<1 hour	39 (26.9)
≥1 hour	106 (73.1)
No. of Hrs of Daily Informal Study Sessions	
<1 hour	56 (38.6)
≥1hour	89 (61.4)

Tally of participants identified to be at risk for developmental delay in one or more domains is presented in Table 2. A total of 37 out of 145 participants or 25.5% were identified to be at risk for delays in one or more domains of development (either motor, cognitive, social or a combination).

6.9% or 10 of the 145 participants were identified to be at risk for Social Developmental Delay alone. Participants identified to be at risk for either Gross Motor Developmental Delay (16, 11%), Fine Motor Developmental Delay (5, 3.4%) or both, based on their scaled scores in the ECCD Checklist, were included in the tally of those at risk for Motor Developmental Delay. With this, 12.4% or 18 of the 145 participants were identified to be at risk for Motor Developmental Delay alone. Participants identified to be at risk for either Receptive Language Developmental Delay (9, 6.2%), Expressive Language Developmental Delay (22, 15.2%), Cognitive Developmental Delay (7, 4.8%) or a combination, based on their scaled scores in the ECCD Checklist, were included in the tally of those at risk for 7 Cognitive Developmental Delay. With this, 16.6% or 24 of the 145 participants were identified to be at risk for Cognitive Developmental Delay alone (Table 2).

Table 2. Demographic Data of the Sample in Terms of Risk of Developmental Delay

	n (%)
Risk for Motor Developmental Delay	**18 (12.4)**
Gross Motor Developmental Delay	16 (11)
Fine Motor Developmental Delay	5 (3.4)
Risk for Cognitive Developmental Delay	**24 (16.6)**
Receptive Language Developmental Delay	9 (6.2)
Expressive Language Developmental Delay	22 (15.2)
Cognitive Developmental Delay	7 (4.8)
Risk for Social Developmental Delay	**10 (6.9)**
Risk for Developmental Delay in One or More Domains	**37 (25.5)**

Univariate and Multivariate analysis were both applied to determine whether there is an association between the risk of developmental delay in each domain (motor, cognitive, social, or the presence of any or all) and the 1) Composition of the household,; 2) Hours spent daily for physical activity; 3) Daily screen time; and 4) Hours spent daily for informal study sessions. Chi-square test and Logistic Regression were used in the Univariate Analysis. Multiple Logistic Regression was utilized in the Multivariate Analysis, and the Prevalence Odds Ratios with a 95% confidence interval were also calculated. Level of significance was set at $\alpha = 0.05$.

Presented in Table 3.1 is the Univariate analyses for Risk of Developmental Delay. Participants who were identified to be at risk for developmental delays in one or more of the domains were included in the analysis of this section. Risk for Developmental Delay was found to be highest among those with more than or equal to 1 hour of daily physical activity (35, 94.6%, p=0.678) and more than or equal to 1 hour of daily screen time (32, 86.5%, p=0.033). But in terms of hours of informal study sessions, developmental delay was highest in those with less than 1 hour of informal study sessions daily (165, 43.2%, p=0.503).

We also note that there is a significant difference between the risk of developmental delay in participants whose daily screen time is more than or equal to 1 hour compared to those with daily screen time of less than an hour (p=0.033). This congruent with the findings in the Multivariate analysis (Table 3.2), where a significant difference was also noted in the risk of developmental delay among those who had daily screen time of more than or equal to 1 hour (p=0.034) compared to

those who had screen time of less than 1 hour. These results suggest that odds that participants who had daily screen time of more than or equal to 1 hour have developmental delay are two times more likely compared to those who had screen time of less than 1 hour (OR=3.055, 95% CI=1.088 to 8.580).

In the Multivariate Analysis (Table 3.2), there were no associations found between risk of developmental delay, and hours of daily physical activity (p=0.433), and hours of daily informal study sessions (p=0.327).

Table 3.1. Univariate Analysis of Risk of Developmental Delay

	Developmental delay, n=37 n (%)
No of Hrs of Daily Physical Activity	
<1 hour	2 (5.4)
≥1 hour	35 (94.6)
Pearson Chi-Square, p=0.678	
No of Hrs of Daily Screen Time	
<1 hour	5 (13.5)
≥1 hour	32 (86.5)
Pearson Chi-Square, p=0.033	
No of Hrs of Daily Informal Study Sessions	
<1 hour	165 (43.2)
≥1 hour	21 (56.8)
Pearson Chi-Square, p=0.503	

Table 3.2. Multivariate Analysis of Risk of Developmental Delay

	Sig.	OR	95% C.I.for OR Lower	Upper
No of Hrs of Daily Physical Activity				
≥1 hour	0.433	1.968	0.362	10.716
No of Hrs of Daily Screen Time				
≥1 hour	0.034	3.055	1.088	8.580
No of Hrs of Daily Informal Study Sessions				
≥1 hour	0.327	0.666	0.295	1.502

Cognitive Developmental Delay

Risk for Cognitive Developmental Delay was found to be highest among those with more than or equal to 1 hour of daily physical activity (22, 91.7%, p=0.761), more than or equal to 1 hour of daily screen time (21, 87.5%, p=0.082), and more than or equal to 1 hour of daily informal study sessions (13, 54.2%, p=0.427). There were no associations in the Multivariate analysis for Risk of Cognitive Developmental Delay (Table 4.2).

Table 4.1. Univariate Analysis of Risk of Cognitive Developmental Delay

Profile, n=145	Cognitive developmental delay, n=24 n (%)
No of Hrs of Daily Physical Activity	
<1 hour	2 (8.3)
≥1 hour	22 (91.7)
Pearson Chi-Square, p=0.761	
No of Hrs of Daily Screen Time	
<1 hour	3 (12.5)
≥1 hour	21 (87.5)
Pearson Chi-Square, p=0.082	
No of Hrs of Daily Informal Study Sessions	
<1 hour	11 (45.8)
≥1 hour	13 (54.2)
Pearson Chi-Square, p=0.427	

Table 4.2. Multivariate Analysis of Risk of Cognitive Developmental Delay

	Sig.	OR	95% C.I.for OR Lower	Upper
No of Hrs of Daily Physical Activity				
≥1 hour	0.939	1.070	0.189	6.051
No of Hrs of Daily Screen Time				
≥1 hour	0.89	3.025	0.845	10.834
No of Hrs of Daily Informal Study Sessions				
≥1 hour	0.406	0.669	0.259	1.728

Motor Developmental Delay

Risk for Motor Developmental Delay was found to be highest among those with more than or equal to 1 hour of daily physical activity (17, 94.5%, p=0.810), more than or equal to 1 hour of daily screen time (16, 88.9%, p=0.107), and more than or equal to 1 hour of daily informal study sessions (12, 66.7%, p=0.623). There were no associations in the Multivariate analysis for Risk of Motor Developmental Delay (Table 5.2).

Table 5.1 Univariate Analysis of Risk of Motor Developmental Delay

	Motor developmental delay, n=18 n (%)
No. of Hrs of Daily Physical Activity	
<1 hour	1 (5.5)
≥1 hour - <2 hours	17 (94.5)
Pearson Chi-Square, p=0.810	
No. of Hrs of Daily Screen Time	
<1 hour	2 (11.11)
≥1 hour	16 (88.9)
Pearson Chi-Square, p=0.107	
No. of Hrs of Daily Informal Study Sessions	
<1 hour	6 (33.3)
≥1 hour	12 (66.7)
Pearson Chi-Square, p=0.623	

Table 5.2. Multivariate Analysis of Risk of Motor Developmental Delay

	Sig.	OR	95% C.I.for OR Lower	Upper
No of Hrs of Daily Physical Activity				
≥1 hour	0.871	1.208	0.124	11.814
No of Hrs of Daily Screen Time				
≥1 hour	0.125	3.284	0.718	15.029
No of Hrs of Daily Informal Study Sessions				
≥1 hour	0.718	1.230	0.401	3.771

Risk for Social Developmental Delay was found to be highest among those with more than or equal to 1 hour of daily physical activity (2, 20%, p=0.090) and more than or equal to 1 hour of daily screen time (1, 10%, p=0.212). But in terms of hours of informal study sessions, social developmental delay was highest in those with less than 1 hour of informal study sessions daily (6, 60%, p=0.150). There were no associations in the Multivariate analysis for Risk of Social Developmental Delay (Table 6.2).

Table 6.1. Univariate Analysis of Risk of Social Developmental Delay

	Social developmental delay, n=10 n (%)
No of Hrs of Daily Physical Activity	
<1 hour	2 (20)
≥1 hour	8 (80)
Pearson Chi-Square, p=0.090	
No of Hrs of Daily Screen Time	
<1 hour	1 (10)
≥1 hour	9 (90)
Pearson Chi-Square, p=0.212	
No of Hrs of Daily Informal Study Sessions	
<1 hour	6 (60)
≥1 hour	4 (40)
Pearson Chi-Square, p=0.150	

Table 6.2. Multivariate Analysis of Risk of Social Developmental Delay

	Sig.	OR	95% C.I.for OR Lower	Upper
No of Hrs of Daily Physical Activity				
≥1 hour	0.357	0.414	0.063	2.708
No of Hrs of Daily Screen Time				
≥1 hour	0.241	3.545	0.428	29.359
No of Hrs of Daily Informal Study Sessions				
≥1 hour	0.305	0.470	0.111	1.990

DISCUSSION

Results of the study showed that 25.5% or 34 out of the 145 participants were identified to be at risk for developmental delays in one or more domains of development evaluated in the study (either motor, cognitive, social or a combination). In a pre-pandemic study done among Filipino children using the Griffiths Mental Development Scales (GMDS), it was revealed that risk for developmental delay is 5.4% at 6 months old, 19.1% at 12 months old and 11.0% at 24 months old.[12] With this, we identify an increase in the percentage of children at risk for developmental delays during the pandemic. But we take this comparison with a grain of salt since the scales used in this study and in the previous study were different.

Individually, 16.6% were noted to be at risk for Cognitive developmental delay, 12.4% for Motor developmental delay, and 6.9% for Social developmental delay,8 in line with other studies which identify increased risk for delay in language (cognitive), and fine motor (motor) skills among toddlers during the pandemic. [12,13,14,15] With the pandemic, work-from-home setups were abound, decreasing parent-child interaction despite being together in one household during the lockdown. This could have potentially affected children's language development negatively as in our study.[15]

Risk of Developmental Delay and Daily Screen Time

In terms of screen time, more than half of the participants at 73.1% (106, n=145) had more than one hour of screen time daily, in line with international studies,[5,16,17] which noted a daily screen time of more than one to two hours. This contradicts the AAP's guidelines which discourages screen time, except for video-chatting, in younger than 24 months; and which limits daily media exposure to 1 hour or less in older than 24 months.[18] One possible reason for increased screen time during the pandemic could be related to the duration of lockdown in the country, such that children from countries with longer lockdowns had increased screen time.[19] In the same study, the longer the caregivers stayed at home to care for the children while also working from home, the more screen time the children had since they had limited access to other offline activities. This is consistent with our Philippine setting. With this, it must be emphasizes to parents and caregivers that, since brain development is at its peak during early childhood, toddlers need more hands-on, unstructured, and social play, as opposed to passive learning from media, to enhance cognition and social skills.[19]

Our study also suggested that toddlers with daily screen time of an hour or more were more likely to have increased risk of developmental delay in one or more developmental domains. Several studies have noted this correlation, explaining that this might be due to lost opportunities to hone skills crucial to development.[19,20,21,22,23]

While on screens, without physical interaction, children are more sedentary hence gross motor skills are not honed. Being on screens also disrupts social interactions thus cognition (expressive and receptive language skills), as well social skills, including nonverbal exchanges), are not honed.[20] Increased screen time, particularly during the lockdown, decreased time on other enriching activities, with children spending less time reading or being read to.[19,21,22,23]

Risk of Developmental Delay and Daily Physical Activity

No significant correlation was found between the hours of daily physical activity and the risk of delay but more than half of the participants had more than an hour of daily physical activity at 93.1% despite lockdown restrictions. This is contrasting pre-pandemic data,[20] which identified that among children's different occupations or the "everyday activities that bring meaning and

purpose to life,"[21] the time allotted for play is among the lowest. This may be explained by caregivers encouraging more physical activity during the lockdown to compensate for the lack of outdoor exposure.

Risk of Developmental Delay and Daily Informal Study Time

No significant correlation was found between the hours of daily informal study sessions and the risk of delay, but 61.4% of the participants spent more than an hour of informal study sessions without gadget use. This is consistent with pre-pandemic data, which notes that educational activities ranked second in activities children spend most of their time on.[24]

CONCLUSION

Our study revealed that 25.5% of toddlers were identified to be at risk for developmental delays in motor, cognitive, and/or social development during the COVID-19 pandemic. In particular, toddlers are at an increased risk for cognitive and motor delay, which is consistent with international data. Furthermore, it was identified that the hours of daily screen time may be a factor correlated with risk for developmental delay.

Our study also found that more than half of toddlers had more than an hour of daily screen time, contrary to AAP recommendations. In relation to this, it was found that children with daily screen time of an hour or longer were more likely to have increased risk of delay in one or more developmental domains at 86.5%.

Our findings emphasize the need for educational interventions that would support those falling behind developmentally. This may also serve as a wakeup call to parents and child healthcare practitioners to reevaluate educational practices and lifestyles adopted during the pandemic. Child- and family-oriented institutions should develop programs that would assist caregivers in providing an environment that is open to opportunities for play and learning in the "new normal". The use of technology in education will surely prevail given the convenience it brought to our lives; but noting its pitfalls, we must work around it to help prevent the succeeding generations from falling into the same developmental setbacks. With growth at an overdrive during this period, we can still definitely influence the course of these toddlers' development and create better opportunities for their future.

LIMITATION AND RECOMMENDATIONS

The following are the limitations of the study. First would be the small sample size and the exclusivity of the sampled population, with the authors recommending including a larger population spanning citywide and regional initiatives. Second, while caregivers may be the best informants of toddlers, single informant measurement may introduce memory and social desirability bias. Future studies could use of other objective measures of developmental outcomes. Finally, our cross-sectional findings cannot assume directional associations. The strength of the statistical design could be improved by ensuring a more homogenous population, though this does not account for confounding variables (i.e., parenting, attachment style).

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