

ORIGINAL ARTICLE

PSYCHOSOCIAL IMPACT OF COVID-19 PANDEMIC ON CHILDREN OF HEALTHCARE WORKERS AT A PRIVATE TERTIARY HOSPITAL IN MANILA USING THE PEDIATRIC SYMPTOMS CHECKLIST-35

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3rd PLACE 2024 PIDSP RESEARCH CONTEST

ABSTRACT

Background: The COVID-19 pandemic led to a public health emergency causing changes that may pose a greater risk of behavioral and psychosocial problems for children. Children of healthcare workers are possibly at increased risk of mental health problems due to their parent's constant exposure to COVID-19. The Pediatric Symptoms Checklist-35 (PSC-35) is one of the validated psychosocial screening tools that helps identify emotional, cognitive, and behavior problems in children.

Objective: To determine the psychosocial impact of COVID-19 pandemic on 6-16 years old children of healthcare workers using the PSC-35.

Methodology: This is a cross-sectional analytic study. Demographic and clinical data were collected. PSC-35 were administered from June 2023-September 2023 to the healthcare worker parents with children aged 6-16 years old. Using this validated PSC-35, questions are a series of signs and symptoms related to impairments in cognitive, emotional, and/or behavioral well-being of children. This 35-item questionnaire was rated and scored as 0 for Never, 1 for Sometimes, and 2 for Often. The total scores were evaluated, calculated, and interpreted. A cut off score of 28 or higher indicates a high possibility psychosocial impairment that warrant further investigation or referral to a specialist.

Results and Conclusions: Out of 372 respondents, 4.57% (n=17) children were found at risk of psychosocial impairment with PSC-35 score of 28 and higher. Two demographic factors were found to have a significant correlation with scores above the cutoff: maternal occupation (p-value 0.018) and the presence of comorbidity in the parent (p-value 0.000). Children found to be at risk were advised consultation with a specialist.

KEYWORDS: *Children of healthcare workers, PSC -35, COVID-19 pandemic*

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The author declares that the data presented are original material and has not been previously published, accepted or considered for publication elsewhere; that the manuscript has been approved by the author, and that the author has met the requirements for authorship.

INTRODUCTION

The COVID-19 pandemic has significantly affected the lives of many resulting in a global burden. Due to the novel coronavirus being considered as a public health emergency of international concern, nationwide lockdown was implemented last March 2020 following confirmed local transmissions in the Philippines.¹ As the global burden continued to emerge, one of the most identified population who are at risk of psychological and behavioral problems were children and adolescents. At the start of the pandemic, it was initially reported that children pose a lower risk of acquiring COVID-19 infection.² However, they are not exempted from the health protocols that were imposed during the pandemic to reduce the spread of the virus. These sudden changes in lifestyle, work, school, and daily living became the new normal. Healthcare workers (HCW) are at great risk for COVID-19 with constant exposure to the virus while providing care for patients, and the need to perform duties related to the diagnosis and treatment of these patients. These exposures may lead to constant stress and possible mental health concerns among the families of healthcare workers, especially to their children.³ The World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF), and Centers for Disease Control and Prevention (CDC) raised their concerns regarding the children's psychological and mental health issues that prompted further studies regarding this matter.

This study aimed to assess the psychosocial impact the COVID-19 pandemic has on the children of healthcare workers in the Philippine setting, as well as explore the factors that may affect these. We hope that this study will add to the body of knowledge regarding the psychosocial status of children of healthcare workers during a pandemic. Moreover, this study may serve as a guide in the recognition and treatment of psychosocial problems among Filipino children in light of a post-pandemic setting.

This study was conducted to assess and identify the psychosocial impact of the COVID-19 pandemic on children of healthcare workers at a tertiary hospital in Manila so that timely intervention if necessary can be advised. It aimed to identify the possible risks and evaluate the psychosocial well-being of children of healthcare workers, as well as what factors contribute to their mental health, most especially at the time of the pandemic

This study looked into 6-16 years old children of healthcare workers in a private tertiary hospital in Manila using the Pediatric Symptom Checklist (PSC)–35 to evaluate psychosocial dysfunction risk. Specific objectives include describing demographic and clinical profiles of subjects, determining the prevalence of psychosocial impairment risk, and identifying associations of subjects at risk for psychosocial impairment with various factors such as age, gender, child's school level, sibling rank, parental age and gender, marital status, parental's highest educational attainment, occupation, annual family income, number of people in the household, COVID-19 exposure in the family, history of confirmed COVID-19 infection in the child and comorbidities of the parents, as well as the child.

OPERATIONAL DEFINITION OF TERMS

- **Healthcare workers (HCW)** –The scope of healthcare workers is defined by the International Classification of Healthcare Workers used by the World Health Organization.⁴ These include, but are not limited to: doctors, nursing staff (nurses, nurse aides, midwives), ancillary diagnostic staff (medical technologists, laboratory technicians, radiology technologists), allied health professionals (dentists, physical/occupational/speech therapists, pharmacists, nutritionists, dietitians), health support (hospital-based psychologists, social workers, ambulance staff) and utility personnel (management, office and clerical staff, secretaries, maintenance workers).

- **Psychosocial Well-being (PWB)** – includes emotional or psychological well-being, as well as social and collective well-being.⁵
- **The Pediatric Symptom Checklist (PSC-35)** – a parent/guardian-completed version, developed by Jellinek MS and Murphy JM, is a psychosocial screening tool that is validated, brief, freely available, and downloadable that is readily answerable by parents or guardians.^{6,7} It may be used in children and adolescents aged 6-16 years old, and is designed to facilitate the recognition of cognitive, emotional, and behavioral problems among children so that appropriate interventions can be initiated at the earliest possible time.
- **Confirmed COVID-19** – defined as positive RT PCR swab or antigen test result.
- **Chronic and serious illness** – defined broadly as conditions that last 1 year or more and require ongoing medical attention or limit activities of daily living or both.⁸ Serious illness is defined as illnesses or conditions that have caused significant debilitation in a patient and/or their household, likely caused by poor management and control of the condition itself.

MATERIALS AND METHODS

Study Design

Cross-sectional analytic study

Setting

The study was conducted in a private tertiary hospital in Manila City, Philippines, from June to September 2023.

Subjects

The subjects of this study are 6-16 years old children of healthcare workers working in a tertiary hospital in Manila.

Inclusion Criteria

To be considered for participation in this study, the children should have met the following criteria: their parents must be employed at the study location, they must be between the ages of 6 and 16 years, and their parents must provide written consent.

Healthcare workers can enroll their children in the study regardless of the number of children they have within the study age group. If both parents are healthcare workers and they have only one child in the age group, only one parent answered the questionnaire. Any child can only be enrolled once by any one of the healthcare worker parent.

Exclusion Criteria

Children with the following conditions were excluded: those with cognitive and communicative impairment, chronic and serious illnesses and previously diagnosed and treated mental health conditions

The subjects were excluded from the study to eliminate any additional risks beyond COVID-19 from confounding the study results. These exclusion criteria were established in the respondents during screening of the subjects using professional evaluation or certification.

Sample size

The computed sample size was 339 subjects. The sample size was calculated using Slovin's formula for determining the minimum sample size needed within a given population, as stated below:

$$n = \frac{N}{1 + N(e)^2}$$

N = population size (2200)

e = sampling error (0.05)

n = required sample size

This computation was based on a margin of error of 0.05 or less with an estimated population of 2,200 healthcare workers in the study location.

A total of at least 339 children of healthcare workers were enrolled in the study. Convenience sampling was used in choosing eligible subjects who were screened based on the inclusion criteria. A list of doctors (active and visiting) was taken from the Medical Staff Association (MSA). The same was done for a list of nurses from the Nursing Service Department (NSD) and a list of other employees from Human Resource Management (HR) not included among medical staff and nurses. The healthcare worker parent/s of the enrolled children were the ones who answered the questionnaires.

Procedure

This research protocol was submitted to and approved by the Research Ethical Review Board (RERB) of the study hospital. After obtaining approval from the RERB, a letter of request for approval, along with a copy of the research protocol, was sent to the Office of the Medical Director and Department of Pediatrics for approval prior to conducting the research. Moreover, a letter of request for the list of health care workers with children aged 6-16 years old, along with the consent forms in English and Tagalog templates, was sent to the Medical Staff Association (MSA), the Nursing Service Department (NSD) and Human Resource (HR) Department.

Data collection

This questionnaire-based survey was conducted from June to September 2023. It was answered in a face-to-face setting by the healthcare workers (parent/s) with 6–16-year-old children as subjects. The healthcare worker answered the questionnaire for approximately 5-10 minutes. It is important to note that the parents or guardians are typically the first to recognize any issues that involve their child's behavior, emotions, or learning, thus the choice of PSC-35 checklist to be answered by a parent or guardian for this study.

The first part included the baseline information that includes the child's age, gender, place of residence, school level, sibling rank, parents'

highest educational attainment, parental occupation, socioeconomic status, exposure to confirmed COVID-19 in the family, history of confirmed COVID 19 infections in the family, number of people in the household, presence of co-morbidity in parents and the presence of co-morbidity in the child.

The second part involved the Pediatric Symptom Checklist (PSC) consisting of 35 questions. Face-to-face setting was chosen to limit the drop-out rate. The respondents were given ample time to complete the checklist. Their children were not around during the time they were asked to answer the checklist. They were likewise not allowed to bring the checklist home.

Instrument Used: The Pediatric Symptoms Checklist (PSC)-35

This study used the validated English and Filipino translated PSC-35 checklist. It is a screening tool designed to improve the recognition of psychosocial problems in children that is freely available and downloadable. Developed in the USA, it has been demonstrated to have a sensitivity of 0.95, a specificity of 0.68, and a Cronbach alpha score of 0.89, indicating high internal consistency.^{7,9} It consists of 35 questions that are rated and scored as "Never (Hindi)" 0, "Sometimes (Paminsan-minsan)" 1, and "Often (Madalas)" 2. These questions describe a series of signs and symptoms related to impairments in cognitive, emotional, and/or behavioral well-being in children, and is designed to alert for a need for further investigation.⁷ The total score was calculated by adding the score of each individual items. A score of 0 to 70 can be obtained. For age 6 to 16 years old, a cut off score of 28 or higher indicates a high possibility psychosocial impairment and warrants a suggestion to seek further evaluation by a qualified health or mental health professionals.⁷ If one to three items are left blank, a score of 0 is implied for these blank items but if there are four or more items unanswered, the questionnaire is considered invalid.

Data Analysis

Microsoft Excel was used for data recording, whereas SPSS version 25 was utilized for data analysis. Demographic and associated clinical data were described using descriptive statistics and presented in number and percent values. Frequency distribution tables were also employed to present the data gathered. Comparisons between categorical variables were performed using the Pearson chi-squared test with degrees of freedom, with significance defined as $p < 0.05$. All analyses were controlled for significant confounding variables according to the demographic data collected.

Ethical Considerations

This protocol adhered to ethical considerations and ethical principles set out in relevant guidelines including the WHO guidelines, Declaration of Helsinki, Data Privacy Act of 2012, and National Ethics Guidelines for Health Research. In accordance with the Data Safety, Privacy, and Confidentiality, all the participants' information will be kept confidential. All forms of identifiable information and data were given a code number. Only the principal investigator and key personnel for this research had access to this master list. The principal investigator and all key personnel have completed the Good Clinical Practice (GCP) training on the responsible conduct of research with human data.

This study was only initiated upon the approval of the RERB of the said hospital. A consent form in English and Filipino format was filled up by the participants respectively prior the answering the questionnaires.

Respondents with children above scores of 28 were informed of the results and advised by the researchers to seek further consultation with a children's mental health specialist. This was done in a private and confidential setting.

RESULTS

Among the population of healthcare workers surveyed, 385 questionnaires were distributed. Of these, five responses were eliminated due to incomplete or unanswered forms. Eight responses were also removed due to subjects meeting exclusion criteria. This left a total of 372 responses included in the final analysis.

Table 1 records the data collected for the demographics of the children of the respondents. There were 51.6% males ($n=192$) and 48.4% females ($n=180$), a large proportion belonging to the age group 12-16 years (35.8%, $n=133$). More than half of these are firstborns (51.1%, $n=190$), and a third are currently in junior high school (33.3%, $n=124$). Among the parents of the subjects who were included in the final analysis, 74.2% ($n=276$) were females and 25.8% ($n=96$) were males, predominantly in their 30s and 40s and majority are married.

Table 1. Demographic profile of the 6-16 year old children of healthcare workers in a private hospital

	Total (n=372), number (%)		Total (n=372), number (%)
Age of Child (years)		Mother's Employment	
6-8	81 (21.8)	Technical and Associate Professionals	47 (12.6)
8-10	76 (20.4)	Clerical Support	55 (14.8)
10-12	82 (22.0)	Service and Sales	64 (17.2)
12-16	133 (35.8)	Craft and Trade	2 (0.5)
Gender of Child		Plant and Machine Operations	1 (0.3)
Male	192 (51.6)	Elementary work	10 (2.7)
Female	180 (48.4)	Unemployed/Deceased	33 (8.9)
Child's Present School Level		Father's Educational Attainment	
Primary	77 (20.7)	Some elementary	2 (0.5)
Intermediate	68 (18.3)	Elementary graduate	6 (1.6)
Middle	76 (18.3)	Some High School	16 (4.3)
Junior High School	124 (33.3)	High School Graduate	54 (14.5)
Senior High School	27 (7.3)	Some College	82 (22.0)
Sibling Rank of Child		College Graduate	187 (50.3)
First	190 (51.1)	Postgraduate	25 (6.7)
Second	91 (24.5)	Father's Employment	
Third	55 (14.8)	Armed Forces	1 (0.3)
Fourth	24 (6.5)	Management	9 (2.4)
Fifth	7 (1.9)	Professionals	107 (28.8)
Sixth	0 (0)	Technical and Associate Professionals	49 (13.2)
Seventh	5 (1.3)	Clerical Support	33 (8.9)
Age of Parent (years)		Service and Sales	49 (13.2)
19-25	1 (0.3)	Agri Aqua and Forestry	2 (0.5)
26-30	21 (5.6)	Craft and Trade	10 (2.7)
31-35	77 (20.7)	Plant and Machine Operations	55 (14.8)
36-40	99 (26.6)	Elementary work	6 (1.6)
41-45	89 (23.9)	Unemployed/Deceased	51 (13.7)
46-50	59 (15.9)	Household Income (PHP)	
51-55	24 (7.0)	Below 40,000	1 (0.3)
Marital Status of Parent		40,000-59,999	5 (1.3)
Married	259 (69.6)	60,000-99,999	75 (20.2)
Living In	64 (17.2)	100,000-249,999	138 (37.1)
Separated	32 (8.6)	250,000 and above	153 (41.1)
Widow/Widower	10 (2.7)	Number of people in household	
Single Parent	7 (1.9)	2	6 (1.6)
Mother's Educational Attainment		3	53 (14.2)
Some elementary	1 (0.3)	4	87 (23.4)
Elementary graduate	3 (0.8)	5	89 (23.9)
Some High School	8 (2.2)	6	68 (18.3)
High School Graduate	51 (13.7)	7	40 (10.8)
Some College	37 (9.9)	8	12 (3.2)
College Graduate	245 (65.9)	9	6 (1.6)
Postgraduate	27 (7.3)	10 and above	11 (3.0)
Mother's Employment			
Management	7 (1.9)		
Professionals	153 (41.1)		

Parents were stratified according to level of education, as well as occupational group based on the Philippine Standard Occupational Classification (PSOC) published by the Philippine Statistics Authority (PSA).¹⁰ For both parents, the educational attainment was found to be at predominantly college graduate level (65.9%, n=245), while most occupations are in the professional group (41.1%, n=153). As for annual income, 41.1% (n=153) have a household income of 250,000 and above. Many of the households have five individuals living together (23.9% n=5).

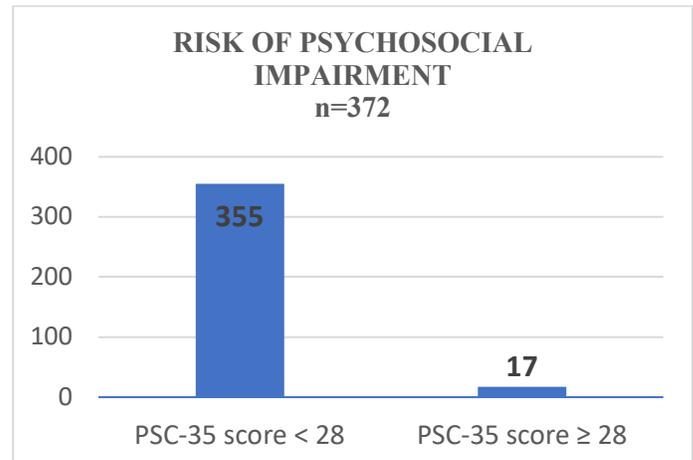
Table 2 records the clinical profile of the children. Almost half have households with a history of confirmed COVID-19 infections (48.9%, n=182), while over a third of the children assessed have a history of COVID-19 infection (36.0%, n=134). A total of 19.4% (n=72) parents have known comorbid conditions, with many of them having hypertension and/or bronchial asthma 7.5% (n=28). Among the children, the predominant comorbidity is bronchial asthma (40%, n=15). ng/ml from two patients who had severe MIS-C illness, while the rest ranged from 0.4 to 4.5 ng/ml.

Table 2. Clinical profile of the 6-16 year old children of healthcare workers in a private hospital.

	Total (n=372), number (%)
Confirmed COVID-19 in the household	
No	190 (51.1)
Yes	182 (48.9)
History of COVID-19 infection in the child	
No	238 (64.0)
Yes	134 (36.0)
Comorbidity in Parent	
None	300 (80.6)
Bronchial Asthma	28 (7.5)
Diabetes Mellitus	10 (2.7)
Heart Failure	1 (0.3)
Hypertension	28 (7.5)
Hyperthyroidism	2 (0.5)
PCOS	1 (0.3)
Rheumatoid Arthritis	2 (0.5)
Comorbidity in Child	
None	352 (94.6)
Bronchial Asthma	15 (4.0)
Chronic Dermatoses	3 (0.8)
Obesity	1 (0.3)
Hypertension	1 (0.3)

Graph 1 shows the prevalence of children who are at risk of psychosocial impairment. Out of the total respondents, 4.57% (n=17) have a PSC-35 score of 28 or higher, indicating an increased risk of psychosocial impairment warranting further

assessment. The researchers informed these respondents confidentially and recommended to seek further consultation with a mental health specialist.



Graph 1. Prevalence of children who are at risk of psychosocial impairment based on the Pediatric Symptom Checklist (PSC-35).

Table 3 shows the breakdown of occupations of parents with respect to hospital position. 34.7% (n=129) of the parents work as a nurse followed by housekeeping staff (15.6%, n=58) then nursing aide (9.14%, n=34).

Table 3. Breakdown of occupations of parents and risk psychosocial dysfunction of their children based on Pediatric Symptom Checklist (PSC-35).

	Total (n=372), number (%)	PSC-35 score < 28 (n=355), number (%)	PSC-35 score ≥ 28 (n=17), number (%)
Nurse	129 (34.7)	126 (35.5)	3 (17.6)
Housekeeping Staff	58 (15.6)	49 (13.8)	9 (52.9)
Nursing Aide	34 (9.14)	31 (8.7)	3 (17.6)
Physician	29 (7.8)	29 (8.2)	0 (0)
Hospital Unit Clerk	24 (6.5)	23 (6.5)	1 (5.8)
Nursing Orderly	22 (5.9)	22 (6.2)	0 (0)
Security Guard	17 (4.6)	17 (4.8)	0 (0)
Midwife	8 (2.2)	8 (2.3)	0 (0)
Medical Social Worker	5 (1.3)	5 (1.4)	0 (0)
CGH Elevator Operator	5 (1.3)	5 (1.4)	0 (0)

Cardiovascular Technologist	4 (1.1)	4 (1.1)	0 (0)
Purchase Requisition Clerk	4 (1.1)	4 (1.1)	0 (0)
Stock Custodian	3 (0.8)	3 (0.8)	0 (0)
CGH Telephone Attendant	3 (0.8)	3 (0.8)	0 (0)
Xray Department Secretary	3 (0.8)	3 (0.8)	0 (0)
Xray Department Receptionist	3 (0.8)	3 (0.8)	0 (0)
Accountant	3 (0.8)	2 (0.6)	1 (5.8)
Fixed Asset Admin	2 (0.5)	2 (0.6)	0 (0)
Medical Record Staff	2 (0.5)	2 (0.6)	0 (0)
Respiratory Therapist	2 (0.5)	2 (0.6)	0 (0)
HR Staff	2 (0.5)	2 (0.6)	0 (0)
Hospital Stock Controller	1 (0.3)	1 (0.3)	0 (0)
Technician	1 (0.3)	1 (0.3)	0 (0)
Xray Department Technician	1 (0.3)	1 (0.3)	0 (0)
CGH Purchasing Encoder	1 (0.3)	1 (0.3)	0 (0)
Pharmacist	1 (0.3)	1 (0.3)	0 (0)
Information Receptionist	1 (0.3)	1 (0.3)	0 (0)
Medical Secretary	1 (0.3)	1 (0.3)	0 (0)
Department Secretary	1 (0.3)	1 (0.3)	0 (0)
Admin Staff	1 (0.3)	1 (0.3)	0 (0)
Recruitment Supervisor	1 (0.3)	1 (0.3)	0 (0)
Ambulance Driver	1 (0.3)	1 (0.3)	0 (0)

Among the 4.57% (n=17) of the children who are at risk of psychosocial impairment. The highest proportion of their parents is in the housekeeping staff (52.94%, n=9) followed by nurses (17.64% n=3), nursing aides (17.64%, n=3).

Table 4 shows the association of subjects at risk of psychosocial impairment (4.67%, n=17) in relation to their demographic profile. 58.8% (n= 10) are aged 12-16, females (70.6%, n=12), most are in junior high school (47.1%, n=8) and were firstborns. Most of their parents are predominantly aged 36-45 (23.5%, n=4) and married (47.1%, n=8). Educational attainment of mothers and fathers of children with a

risk of psychosocial dysfunction were college graduates (58.8%, n=10) and high school graduates (35.3%, n=6), respectively.

Table 4. Association of children at risk for psychosocial impairment using the PSC-35 of the subjects in relation to their demographic profile.

	No Risk of Psychosocial Impairment or PSC-35 score < 28 (n=355), number (%)	At Risk of Psychosocial Impairment or PSC-35 score ≥ 28 (n=17), number (%)	Total (n=372), number (%)	Pearson's Chi-square (degrees of freedom)	P-value
Age of Child (years)					
6-8	80 (22.5)	1 (5.9)	81 (21.8)	5.39 (3)	0.145
8-10	74 (20.8)	2 (11.8)	76 (20.4)		
10-12	78 (22.0)	4 (23.5)	82 (22.0)		
12-16	123 (34.6)	10 (58.8)	133 (35.8)		
Gender of Child					
Male	187 (52.7)	5 (29.4)	192 (51.6)	3.52 (1)	0.061
Female	168 (47.3)	12 (70.6)	180 (48.4)		
Child's Present School Level					
Primary	76 (21.4)	1 (5.9)	77 (20.7)	3.89 (4)	0.421
Intermediate	66 (18.6)	2 (11.8)	68 (18.3)		
Middle	72 (20.3)	4 (23.5)	76 (18.3)		
Junior High School	116 (32.7)	8 (47.1)	124 (33.3)		
Senior High School	25 (7.0)	2 (11.8)	27 (7.3)		
Sibling Rank of Child					
First	181 (51.0)	9 (52.9)	190 (51.1)	5.26 (5)	0.385
Second	85 (23.9)	6 (35.3)	91 (24.5)		
Third	55 (15.5)	0 (0)	55 (14.8)		
Fourth	23 (6.5)	1 (5.9)	24 (6.5)		
Fifth	6 (1.7)	1 (5.9)	7 (1.9)		
Sixth	0 (0)	0 (0)	0 (0)		
Seventh	5 (1.4)	0 (0)	5 (1.3)		
Age of Parent (years)					
19-25	1 (0.3)	0 (0)	1 (0.3)	0.81 (6)	0.992
26-30	20 (5.6)	1 (5.9)	21 (5.6)		
31-35	74 (20.8)	3 (17.6)	77 (20.7)		
36-40	95 (26.8)	4 (23.5)	99 (26.6)		
41-45	85 (23.9)	4 (23.5)	89 (23.9)		
46-50	56 (15.8)	3 (17.6)	59 (15.9)		

51-55	24 (6.8)	2 (11.8)	24 (27.0)		
Marital Status of Parent					
Married	251 (70.7)	8 (47.1)	259 (69.6)	7.20 (4)	0.126
Living In	58 (16.3)	6 (35.3)	64 (17.2)		
Separated	29 (8.2)	3 (17.6)	32 (8.6)		
Widow/Widower	10 (2.8)	0 (0)	10 (2.7)		
Single Parent	7 (2.0)	0 (0)	7 (1.9)		
Mother's Educational Attainment					
Some elementary	1 (0.3)	0 (0)	1 (0.3)	6.13 (6)	0.409
Elementary graduate	3 (0.8)	0 (0)	3 (0.8)		
Some High School	7 (2.0)	1 (5.9)	8 (2.2)		
High School Graduate	49 (13.8)	2 (11.8)	51 (13.7)		
Some College	33 (9.3)	4 (23.5)	37 (9.9)		
College Graduate	235 (66.2)	10 (58.8)	245 (65.9)		
Postgraduate	27 (7.6)	0 (0)	27 (7.3)		
Mother's Employment					
Management	7 (2.0)	0 (0)	7 (1.9)	18.41 (8)	*0.018
Professionals	149 (42.0)	4 (23.5)	153 (41.1)		
Technical and Associate Professionals	44 (12.4)	3 (17.6)	47 (12.6)		
Clerical Support	54 (15.2)	1 (5.9)	55 (14.8)		
Service and Sales	55 (15.5)	9 (52.9)	64 (17.2)		
Craft and Trade	2 (0.6)	0 (0)	2 (0.5)		
Plant and Machine Operations	1 (0.3)	0 (0)	1 (0.3)		
Elementary work	10 (2.8)	0 (0)	10 (2.7)		
Unemployed/Deceased	33 (9.3)	0 (0)	33 (8.9)		
Father's Educational Attainment					
Some elementary	2 (0.6)	0 (0)	2 (0.5)	12.16 (6)	0.059
Elementary graduate	6 (1.7)	0 (0)	6 (1.6)		
Some High School	14 (3.9)	2 (11.8)	16 (4.3)		
High School Graduate	48 (13.5)	6 (35.3)	54 (14.5)		
Some College	77 (21.7)	5 (29.4)	82 (22.0)		
College Graduate	183 (51.5)	4 (23.5)	187 (50.3)		
Postgraduate	25 (7.0)	0 (0)	25 (6.7)		
Father's Employment					
Armed Forces	1 (0.3)	0 (0)	1 (0.3)	11.34 (10)	0.332
Management	9 (2.5)	0 (0)	9 (2.4)		
Professionals	104 (29.3)	3 (17.6)	107 (28.8)		

Technical and Associate Professionals	49 (13.8)	0 (0)	49 (13.2)		
Clerical Support	30 (8.5)	3 (17.6)	33 (8.9)		
Service and Sales	47 (13.2)	2 (11.8)	49 (13.2)		
Agri Aqua and Forestry	2 (0.6)	0 (0)	2 (0.5)		
Craft and Trade	9 (2.5)	1 (5.9)	10 (2.7)		
Plant and Machine Operations	49 (13.8)	6 (35.3)	55 (14.8)		
Elementary work	6 (1.7)	0 (0)	6 (1.6)		
Unemployed/Deceased	49 (13.8)	2 (11.8)	51 (13.7)		
Household Income (PHP)					
Below 40,000	1 (0.3)	0 (0)	1 (0.3)	8.31 (4)	0.081
40,000-59,999	4 (1.1)	1 (5.9)	5 (1.3)		
60,000-99,999	68 (19.2)	7 (41.2)	75 (20.2)		
100,000-249,999	133 (37.5)	5 (29.4)	138 (37.1)		
250,000 and above	149 (42.0)	4 (23.5)	153 (41.1)		
Number of people in household					
2	6 (1.7)	0 (0)	6 (1.6)	4.56 (8)	0.794
3	52 (14.6)	1 (5.9)	53 (14.2)		
4	82 (23.7)	5 (29.4)	87 (23.4)		
5	84 (23.7)	5 (29.4)	89 (23.9)		
6	63 (17.7)	5 (29.4)	68 (18.3)		
7	39 (11.0)	1 (5.9)	40 (10.8)		
8	12 (3.4)	0 (0)	12 (3.2)		
9	6 (1.7)	0 (0)	6 (1.6)		
10 and above	11 (3.1)	0 (0)	11 (3.0)		
Confirmed COVID-19 in the household					
No	185 (52.1)	5 (29.4)	190 (51.1)	3.35 (1)	0.067
Yes	170 (47.9)	12 (70.6)	182 (48.9)		
History of COVID-19 infection in the child					
No	227 (63.9)	11 (64.7)	238 (64.0)	0.00 (1)	0.949
Yes	128 (36.1)	6 (35.3)	134 (36.0)		
Comorbidity in Parent					
None	291 (82.0)	9 (52.9)	300 (80.6)	35.06 (7)	*0.000
Bronchial Asthma	23 (6.5)	5 (29.4)	28 (7.5)		
Diabetes Mellitus	10 (2.8)	0 (0)	10 (2.7)		
Heart Failure	0 (0)	1 (5.9)	1 (0.3)		
Hypertension	26 (7.3)	2 (11.8)	28 (7.5)		
Hyperthyroidism	2 (0.6)	0 (0)	2 (0.5)		

PCOS	1 (0.3)	0 (0)	1 (0.3)		
Rheumatoid Arthritis	2 (0.6)	0 (0)	2 (0.5)		
Comorbidity in Child					
None	338 (95.2)	14 (82.4)	352 (94.6)	8.71 (4)	0.069
Bronchial Asthma	13 (3.7)	2 (11.8)	15 (4.0)		
Chronic Dermatoses	2 (0.6)	1 (5.9)	3 (0.8)		
Obesity	1 (0.3)	0 (0)	1 (0.3)		
Hypertension	1 (0.3)	0 (0)	1 (0.3)		

*p value <0.05 is significant

Most of their mothers (52.9%, n=9) work in service and sales, while most of their fathers (35.3%, n=6) work in plant and machine operations with an annual household income of 60,000 to 99,999 pesos. 29.4% (n=5) of the children belong to a household consisting of four to six individuals with 70.6% (n=12) confirmed COVID-19 cases. 64.7% (n=11) of these children had no history of COVID-19 infection. Moreso, children who were at risk of psychosocial impairments and their parents had no known comorbidities, corresponding to 82.4% (n=14) and 52.9% (n=9), respectively.

A statistically significant relationship was shown between subjects who were at risk of psychosocial impairment and two specific data points. The first data point was the employment of the mother with a low p-value of 0.018 and a high chi-square (χ^2) value of 18.41 that supports this correlation did not happen by chance. The second data point was the presence of comorbidities in the parent have a high chi-square value (χ^2) of 35.06 and an incredibly low p-value of 0.000, which showed that this link did not happen by coincidence, supporting this association.

DISCUSSION

This study analyzes the factors that may involve increased risk or likelihood of psychosocial impairment in children of healthcare workers after the COVID-19 pandemic crisis. Multiple studies have also documented the increased likelihood of psychosocial conditions in children of healthcare workers.

In 2021, Sugg et al. analyzed a large database of crisis texts made during the pandemic and stratified them into whether they were frontline essential workers, children of frontline essential workers, or neither.¹¹ They have found that children of frontline essential workers were 23% more likely to experience abuse and 11% likely to experience isolation compared to other children who were using the same service. They have also found that male frontline workers were more likely to have substance abuse and suicidal ideations compared to their non-frontline counterparts, while female and non-binary workers were more likely to report self-harm. A parent who is experiencing mental health issues is more likely to affect a child psychologically as the child reacts to the distress of the parent. This is further exacerbated by the isolation of the pandemic, that is known to magnify existing discord among individuals in the household.

A study by Omer et al. (2021) showed the psychosocial impact of the pandemic on the children of physicians.¹² A notable feature of this study was that it surveyed children of working doctors during the pandemic, on their perceptions of potential contributing factors to psychosocial behavioral disorders in their children aged 10-15 years old. Among the most pertinent factors include the anxiety of the child as their parents are healthcare professionals and working in the frontlines while those around them can maintain social distance at home. The results of our study, however, showed that children of HCWs facing increased risk of psychosocial impairment were found to be statistically significantly related to the presence of parents' comorbidities and their mother's employment. Children of physicians, on the other hand, were not found to be at risk of psychosocial impairment probably due to other protective factors present in the family dynamics that is not investigated in the study.

In our study, 4.57% (n=17) of 372 respondents had children who scored at least 28 and higher on the PSC-35. Among these children, more

than half of these are in the adolescent age group (12–16 years old), with a 70.6% (n=12) female predominance. This varies compared to a study done by Alfonso et al. that screened 284 children in another Filipino tertiary institution using the PSC-35.¹³ Their study population found that 11.6% of their study population scored at least 28 on the PSC-35, with a slight female predominance and the most patients are found in the middle childhood age group (6-11 years old). However, the age group of 12–16 years old had the most increased risk of psychosocial impairment in our study. According to Arain et al., hormones play a significant impact in a child's general development, particularly in the structure of the brain. At this age, the child's progress towards adulthood had already begun due to pubertal hormones. Adolescent behavior, neurocircuitry development, and myelination are all influenced by hormones such as progesterone, estrogen, and testosterone.¹⁴ Furthermore, this is the period when kids learn how to think abstractly. Abstract thinking increases their awareness of intricate problems and their possible outcomes. In some circumstances, this may lead them to worry in certain situations.¹⁵ At this point, social cognitive development advances, making people more perceptive to social cues, more vulnerable to social influences, and more prone to anxiety. Adolescents eagerly pursue social interactions while experimenting with a variety of identities and social roles.¹⁶ Hormones are also responsible for the physical development of sexuality and the resulting influence on sexual activities, which can be stressful throughout the transition into adulthood. Additionally, at this point, they might not have fully established healthy coping strategies to handle stress and challenging circumstances. They may be more susceptible to detrimental effects on their mental health as a result.¹⁷

In the current study, there was also a significant correlation found between increased risk of psychosocial impairment and two data points: comorbidity in the parent, and employment of the mother.

For the mother's employment, it is common knowledge that mothers in Filipino households typically serve as the primary caregivers and spend much of their time with their children. Among the children with risk psychosocial impairment, the highest number of their mothers are housekeeping staff, followed by nurses and nurse aids. These are occupations that frequently encounter high-risk areas and patients within the hospital facility. Multiple studies have reported increased psychological conditions such as anxiety and depression in nurses compared to doctors, citing that these are occupations that are more exposed to COVID-19 on a regular basis and with increased severity.^{18,19,20} In addition, housekeeping staff tend to come from a lower socioeconomic background whose households are more vulnerable to the economic attacks of the pandemic, as well as decreased access to alternatives in childcare.²¹ A combination of the risks of exposure, as well as the socioeconomic crisis possibly makes them – and their household – more susceptible to physical and emotional stress.^{22,23}

Regarding the significant correlation between the presence of comorbidities in the parent and psychosocial impairment in the child, it is worth noting that no further classification was done between the severity, management, or status of said comorbidities in the parent. However, it was shown in this study results that among the parents of 8 children with increased risk of psychosocial impairment, 5 of them bronchial asthma, 2 of them have hypertension, and 1 is a known case of heart failure. All of these are comorbidities associated with increased risk of COVID-19-related morbidity and mortality. The children, who are likely aware of this increased risk alongside the already risky exposure of their parents, would most likely experience an increased risk of psychosocial distress in response to this.

The significant relationship between gender, age, and risk of psychosocial impairment in children was not found in our study. These results are

consistent with Erazo et al., which highlight the significant influence of other factors beyond age and gender on children's mental health during the pandemic.²⁴ This is also observed with regards to a child's school level and sibling rank. In contrast with our study, Rauf et al., linked sibling rank with adolescent anxiety disorders.²⁵ This discrepancy might be attributed to the utilization of the PSC-35, which may not capture nuanced aspects of anxiety disorders compared to more tailored instruments like the Screen for Child Anxiety-Related Disorders (SCARED) questionnaire.

Other factors such as parental age, marital status, educational attainment, annual income, and household size have no significant correlation with the risk of psychosocial impairment in children. Multiple studies also suggest that a parent's overall well-being, rather than their age, may serve as a protective factor for their children's mental health.^{26,27,28} Despite the lack of correlation of the current study with marital status, it's noteworthy that marriage has been associated with several positive outcomes, including higher income, increased happiness, longer life expectancy, better overall health, and greater economic mobility. Additionally, research suggests that married individuals are less likely to experience mental health problems. These findings imply that children from married households have better mental support. Likewise, parental educational attainment often correlates with both parental occupation and household income, thereby influencing the resources available to the family, which can buffer the effects of COVID-19.²⁸ In the Philippines, the average number of people living in a household in 2022 is 4.1.²⁹ Compared to our study, many households have five individuals living together. Living with older siblings, who offer opportunities for play, comfort, and security, protects against the formation of behavioral problems, according to a study by Grinde et al.³⁰ This is a highly important protective factor. Comparably, our research did not find any link between the risk of psychosocial

impairment and the number of household members. The disparities in these findings are likely influenced by the intricate interplay of multiple factors, including environmental influences and genetic predispositions.

Lastly, the exposure of children to confirmed COVID-19 infection and history of COVID-19 infection in the child had been a great concern during the pandemic. Although in our study, these two factors showed no correlation with the risk of psychosocial impairment Wenter et al. acknowledge the variability that, while some studies identified exposure as a risk factor, the findings are not clear-cut or inconclusive.³¹ However, Liu et al. found a higher risk of psychological problems in children infected with COVID-19.³² This may be due to other factors that are at play, like the environment and genetics.

CONCLUSION AND RECOMMENDATIONS

In conclusion, this study reports a total of 4.57% (n=17) of children of healthcare workers in a private hospital at risk of psychosocial impairment and majority are aged 12-16, females, in junior high school, and firstborns. Age, gender, sibling rank, school level, parental age, parent's marital status, educational attainment of either parent, employment of the father, annual income, household size, history of confirmed COVID-19 infection in household members, including the child showed no significant correlation with risk of psychosocial impairment.

However, a significant correlation was found between the risk of psychosocial impairment in the child with respect to the employment of the mother and presence of comorbidities in the parent.

This study is done in a single tertiary hospital in Manila only which denotes limited data for the psychosocial impact of the COVID-19 pandemic across the country. Moreover, the study did not provide information on the severity of COVID-19 exposure among healthcare workers, which may be a factor in the psychosocial impairment observed in their children.

For future studies, it is recommended that similar assessments are done across multiple institutions while correlating other patient and household-related factors, in order to gain a more consistent picture of the psychosocial impact of COVID-19 on the children of healthcare workers in the Philippine setting.

CONFLICT OF INTEREST

None declared.

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