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Disease prevention: childcare practices of caregivers in day-cares/pre-schools in Ibadan, Nigeria

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ABSTRACT

Background: Childhood Disease prevention practices (DPP) by day-care/preschools caregivers are essential to the wellbeing of enrolled children. We assessed DPP such as hand hygiene, feeding, nutrition, handling sick children and pre-employment medical screening in day-cares/pre-schools and the factors associated with DPP.

Methods: The cross-sectional study involved 799 pre-school caregivers (teachers and minders/nannies). Ten settlements were selected from five randomly selected metropolitan Local Government Areas in Oyo state, Nigeria. Data collected on DPP was mainly graduated on 3-point Likert like scale: 'always responses' - allotted 2 points; 'sometimes' - 1 point; and 'never' - zero. Using a significance level (p value) set at 5% and higher R-squared values, associations between DPPs and explanatory variables were tested).

Results: Mean age of respondents was 33.7±9.5 years. Majority, 594 (74.3%) did not have pre-employment childcare training. Self-reported hand hygiene was highest for stool moments. Most 456 (56.3%) reported formula feeds for 1-6 months and mainly staples for older children. Aggregated DPP score (80) was dichotomized using mean childcare DPP score of 24±4.5. Slightly more than half of the respondents, 453 (56.7%) had inadequate DPP. Formal childcare training p<0.001, current job specification p=0.02 and knowledge of VPD p=0.004 were associated with DPP index. Some predictors of adequate childcare DPP include facility registration status (OR=2.19, 95%CI=1.05-4.56); respondents who had childcare training (OR=1.52, 95%CI=1.083-2.144); affiliation with health (OR=2.0, 95%CI=1.227-3.262).

Conclusions: This study highlights childcare DPP within the day-cares/pre-schools and provides evidence for tailored training interventions and monitoring of the facilities.

Keywords: Disease prevention, Childcare practices, Pre-schools, Day-cares, Caregivers

INTRODUCTION

Day-cares and Pre-schools are considered the most "institutional" childcare options for working class parents. 1,2 Upon enrolment, several clusters of children aged between one and five years spend substantial time on a daily basis in these settings and have their basic needs attended to by caregivers. A caregiver is someone who provides for the needs of children or people who are ill or cannot provide for their own needs. 3 In the context of

this study, day-cares/pre-schools caregivers were defined as teachers and support workers (minders or nannies) in school/care involved in the daily activities- educational, nutritional, recreational, and hygiene status of the children under-5 years of age. The (minders or nannies have direct care-oriented functions compared with the teachers who do more of teaching. The combined objectives of teaching and children safe and healthy are major explicit and implicit expectations and tasks carried out by caregivers in day-care/preschools settings. Most practices by the caregivers are health-related and can be trigger points for spread of

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infection such as intestinal parasitic infections, diarrhoeal diseases, respiratory tract infections to the more vulnerable children if poorly done. Vaccine preventable diseases (VPDs) such as measles, tuberculosis, and pneumonia are frequently reported.⁴⁻⁹ Disease prevention in these settings demands observance and indoctrinating of optimal childcare practices such as proper feeding, good hand and personal hygiene, environmental sanitation, and proper toileting habit. An earlier survey and subsequent ones in Nigeria suggest sub-optimal childcare disease prevention practices in day-care/preschools and the caregivers as inexperienced and requiring training.¹⁰⁻¹² Besides gaps in caregivers' practices, other factors such as age and overcrowding tendencies in these increase children's susceptibility and rates of infections.

Significant transmission of infections has occurred within day-cares/pre-schools settings in outbreak proportions and often with extensions to other school-aged household members and parent(s).^{7,13} The risk of acquiring infections in these settings is two to three times greater compared to homecare.⁵ In another study on primary tuberculosis infection in day cares children, 32 of 53 attending and 3 of 84 preschools children who are brought in occasionally were infected continually contact with one of their caregivers. 14 WHO reflects the exigencies of child survival strategies. It described it as "matters of life and death when children do not have access to adequate nutrition, clean water and sanitation, basic health services like vaccination, medical treatment, and other life saving measures that can improve their health.¹⁵ In course, the revised Sustainable development child-related goals emphasize childcare strategies that promote a healthier environment for children, and re-orientation of child care and survival in a broader community context. 16,17

More research works and policy thrusts are adopting child-centred approaches to Sustainable development goals using the socio-ecological framework. Unfortunately, there is paucity of comprehensive analyses of day-cares/pre-schools caregivers' practices in this clime and longitudinal surveillance data on the contributions of morbidity and mortality figures of under-fives from these settings as well. From a community perspective that reflects the broader influence of social and economic inputs in child survival, this study assessed the disease prevention measures within day-cares/pre-schools and practices of caregivers therein and as well determined factors associated with health-related childcare practices in these settings.

METHODS

Study setting and study participants

This study was a cross-sectional survey conducted in daycares/pre-schools in settled communities in Ibadan. This research work was part of a larger study in which a total of 240 pre-schools were studied. An average of between 4-7 caregivers work in most pre-school visited. Caregivers in the context of this study included the teachers and minders. A total of 830 caregivers were sampled from five purposively selected metropolitan Local Governments Areas (LGAs) in Ibadan, capital city of Oyo State, Nigeria. In each LGA, there are six to ten administrative units called wards. A settlement was selected from each ward by balloting.

Survey instrument

The study period spanned from January, 2010-November 2013. A semi-structured questionnaire adapted from several resources, for example: "How is Child Care **Ouality** Measured? toolkit: Inter-American A Development Bank", UNICEF's manuals on health status of children (SDG 4) for mothers/caregivers of under-five children were administered by trained research assistants following a two-day training session. 18-20 Thorough literature and expert reviews were conducted to enhance the construct, content and internal validity of the survey instrument prior to it being pre-tested in thirty pre-schools exclusive of the main study population. The variables in each domain of disease prevention practice were graded on a 3-point Likert like scale with (2) assigned to 'almost always'-), 'sometimes' (1) and 'almost hardly or never' (0). Excluding knowledge of common childhood diseases, five of the six domains addressing childcare DPP (feeding, nutrition, hand hygiene, detecting and managing ill children and environmental sanitation) were aggregated to a maximum obtainable score of 80 and dichotomized based on mean score of the composite DPP which is 23.3±4.6

Data management and analysis

The data collected was analyzed using the Statistical Package for Social Sciences (SPSS version 21) software. Childcare DPP variables were initially reported using descriptive statistics prior to being computed into a composite score. Chi-square and binary logistic regression were conducted to test association between outcome variable, DPPs and independent (predictor) variables. Ethical approval was obtained from Oyo State Ethics Review Committee (AD13/479/221/2012). Written informed consents were obtained from administrative heads and respondents prior to conducting interviews.

RESULTS

Socio-demographic characteristics of caregivers in daycares/pre-schools settings

Eight hundred and thirty respondents were approached and 807 responded. However, analyses were conducted on 799 with fully completed questionnaire. Response rate was 96%. The mean age of the respondents was 33.7±9.5 years. The highest proportion of respondents, 300 (37.5%) were young adults between the ages of 21 and 30 years. The least reported age was 16 years. Majority, 776 (97.1%) of the participants were females. Five hundred and fifty-

two (69.1%) had tertiary education. Only 99 (12.4%) mentioned they had medical fitness screening with HIV/AIDS screening being the commonest preemployment medical screening requirement (the frequency distribution of the caregivers' sociodemographics is shown in Table 1).

Hand hygiene moments

Respondents' who self-reported 'always' performing hand hygiene prior to commencing work were (78.7%); before feeding the children (79.6%); after using the toilet (95.6%) and changing each child's soiled pampers (82.1%).

Nutrition patterns and feeding of children in daycares/pre-schools

About 456 (56.3%) of the respondents reported that meals for the children were mainly brought from home. Meals mentioned as from homes included pap 124 (15.5%) and 'indomie' noodles 125 (15.6%). Only 153 (19.1%) who attended to children less than 2 years reported formula feeds were the most common feed given to children between the ages of one to six months. A smaller proportion, 59 (7.4%) of the 201 respondents caring for infants reported warming the expressed breast milk supplied by mothers just before feeding the children. Children aged 6 months and up till 5 years feed mainly on staple food- rice, 'indomie' noodles, 'amala', pap, beans, yam, biscuit and bread with very little of greens (Table 2-4).

Early detection of childhood diseases in day-cares/preschools settings

Measles was considered by 687 (86%) the most infectious of the VPDs, followed by tuberculosis (77.6%) and

chicken pox (77.0%). Caregivers do not engage in treating any illness symptom regardless of type of disease.

Disease prevention practices score categories of caregivers in day-cares/pre-schools

Figure 1 depicts childcare DPP categories based on mean score of 24±4.5. Slightly more than half of the respondents, 453 (56.7%) had inadequate childcare DPP.

Factors affecting disease prevention practices in daycares/pre-schools

On bivariate analysis, formal childcare training p<0.001, current job specification p=0.02 and knowledge of VPD p=0.004 were statistically significant. These variables were consistently associated with childcare disease prevention practice variable on logistic regression. Keeping in view the assumptions for conducting logistic regression, we used the backward likelihood and hierarchical ratio approaches to iteratively compute unadjusted and adjusted odds ratios for the composite binary DPP outcome variables (adequate or inadequate childcare practices). In all, six variables predict childcare disease prevention practice in day-cares/pre-schools. They included: registration status; being registered (OR=2.19, 95% CI=1.05-4.56,); tertiary educational level; (OR=1.57, 95%CI=1.139-2.166; respondents who had childcare training (OR=1.52, 95%CI =1.083-2.144); previous affiliation with health (OR=2.0, 95%CI=1.227-3.262); job specification (being a teacher over minder/combining the two (OR=1.85, 95%CI =1.057-.252); and adequate knowledge of childhood diseases(OR=1.65, 95% CI=1.19-2.285). However, routine medical screening negatively predicts childcare practice (OR=0.40, 95%CI=0.257-0.634) (Table 5 and 6).

Table 1: Shows the socio-demographic characteristics of the caregivers in day-cares/pre-schools settings (n=799).

Demographic characteristics	Frequency	Percentage (%)
Age (years)		
≤20	53	6.6
21-29	246	30.8
30-39	287	35.9
40-49	157	18.9
>50	62	7.8
Sex	·	
Males	23	2.9
Females	776	97.1
Marital status		
Single	238	29.8
Married/ever married	561	70.2
No of children alive		
No children	198	24.7
≤5	258	32.4
> 5	343	42.9

Table 2: Frequency distribution of feeding practices of caregivers in day-cares/pre-schools.

Feeding practices	Proportion of respondents (n=799)	Percentage (%)
Leave food to cool	656	82.1
Fan food to cool	152	19.0
Tasting food prior to feeding child	133	16.6
Cool hot food by putting food pack in a bowl of	124	15.5
water		
Blow the food to cool with mouth	79	9.9
Chew food to soften it before feeding child	44	5.5
Sharing of cups among children	35	4.4
Force feed child	109	13.6

Table 3: Food preservation practices by caregivers in day-cares/early pre-schools children aged (1-6 months).

Food preservation practices	Proportion of respondents (n=182)	Percentage (%)
Kept food in warmers	90	49.5
Refrigerated food	35	19.3
Kept food frozen	23	12.6
Did nothing to preserve food	34	18.7

Note: Multiple responses applicable.

Table 4: Report of nutrition taken by day-cares/early pre-schools children aged (1-6 months).

Food type	Proportion of respondents (n=456)	Percentage (%)
Formular feed	153	33.6
Exp. breast milk	144	3.2
Plain pap	119	26.1
Caregivers breastfeeding children	40	8.8

Table 5: Relationship between socio-demographic variables and categories of childcare disease prevention practices of caregivers in day-cares/pre-schools.

	Childcare DPP								
Variables	Inadequate		Adeq	Adequate		%)	Chi ganara	P value	
	N	%	N	%	N	%	— Chi- square	1 value	
Age (years)									
≤20	29	54.7	24	45.3	53	100			
20-29	154	62.6	92	37.4	246	100			
30-39	160	55.7	127	44.3	287	100	6.263	0.18	
40-49	76	50.3	75	49.7	151	100			
>50	34	54.8	28	45.2	62	100			
Sex			-		·				
Males	13	56.5	10	43.5	23	100	<0.0001	0.99	
Females	440	56.7	336	43.3	776	100	<0.0001	0.99	
Level of education									
None	18	64.3	10	35.7	28	100			
Primary	44	57.9	32	42.1	76	100	5.457	0.14	
Secondary	69	48.3	74	51.7	143	100	J. 4 J/	0.14	
Tertiary	322	58.3	230	41.7	552	100			

Table 6: Association between socio-demographic variables and childcare disease prevention practices of daycares/pre-schools caregivers.

	Childca	Childcare DPP								
Variables	Inadequ	Inadequate		Adequate		%)	Chi canara	P value		
	N	%	N	%	N	%	Chi- square	r value		
Years as a caregi	ver		•	•						
<1	29	35.4	29	35.4	82	100				
1-9	322	57.1	242	42.9	546	100				
10-19	66	52.4	60	47.6	126	100	6.606	0.16		
>20	10	41.7	15	60.0	24	100				
Any formal train	ing									
Yes	97	47.3	108	52.7	205	100	9.879	< 0.001		
No	356	59.9	238	40.1	594	100	9.879			
Current job speci	ification									
Teacher	305	60.6	198	39.4	503	100				
Care-giver	144	52.1	105	47.9	219	100	10.092	0.02		
Both	27	43.5	35	56.5	62	100	10.082			
*Others	7	46.7	8	53.3	15	100				

Note: *-administrative staff.

Table 7: Predictors of good childcare disease prevention practices among day-cares/pre-schools caregiver.

Variables in the model		В	S.E.	Sig.	Exp (B)	95% CI for exp (B)		
variables in the inoder				<i>D</i>		Dig.	Lower	Upper
Registration	Yes	(1)	0.784	0.374	0.036	2.191	4.558	1.053
Registration	No	ref	-	-	0.080	-	-	-
	Teachers/others	(1)	0.617	0.287	0.031	1.854	3.252	1.057
Job specification	Caregivers/minders	(2)	0.179	0.174	0.303	1.196	1.683	0.851
	Both	ref	-	=	-	-	-	-
Child care training	Yes	(1)	0.421	0.174	0.016	1.524	2.144	1.083
Ciniu care training	No	ref	-	-	-	-	-	-
Health-work	Yes	(1)	0.693	0.250	0.005	2.000	3.262	1.227
affiliation	No	ref	-	-	-	-	-	-
Edu completed	No-secondary	(1)	0.452	0.164	0.006	1.571	2.166	1.139
Edu. completed	Tertiary	ref	-	-	-	-	-	-
Routine medical	Yes	(1)	-0.909	0.231	0.000	0.403	0.634	0.257
check	No	ref	-	-	-	-	-	-

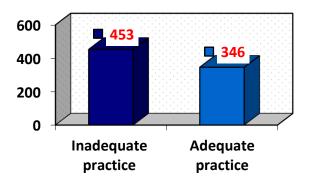


Figure 1: Childcare disease prevention practices among caregivers in day-cares/pre-schools.

DISCUSSION

Preamble

There are several domains of variables that address the quality of early childcare which accumulate to early childhood development process. These range from process variables, child related variables, parents-centered variables and structural variables. ¹⁸⁻²⁰ The structural variables define resources that enable delivery of care and teacher/caregiver-child interactions. ²² They can be more easily controlled, and they are organized into four sub-domains: health and safety, grouping of children, caregivers and infrastructure. ¹⁸ This study did not include the infrastructure sub-domain however draws attention to a broader range of the routine disease prevention childcare practices of caregivers in the day-cares or preschools surveyed. In conjunction with occupational profile of caregivers, other sub-domains of disease

prevention practices which were assessed were on the preemployment medical screening of caregivers, hand hygiene moments, process and preservation of the children's meals, nutrition patterns, detecting illness symptoms and managing ill children and environmental sanitation.

The findings from this study will serve as a crucial point for demonstrating future trends as holistic and timely watchfulness over health-related variables and caregivers in education sector. It will provide evidence for the design of interventions that will fully harness lifesaving or more preventative approaches to early childhood development. Respondents' childcare DPP varied within the domains and specific items within each domain measured however overall, the aggregated childcare DPP was inadequate. Similar observations of suboptimal childcare practice scores have been observed with other studies in different settings. 21,22

Pre-employment medical fitness screening of staff

In this study, slightly above 10-percent of the respondents had conducted pre-employment screening and this is referred to as medical fitness screening. The common screening tests conducted are Tuberculosis (TB), chest-X-ray and HIV/AIDS tests with the last requirement being the commonest pre-employment medical screening requirement. Under the childcare regulation developed by Texas Health and Human Services Commission (HHSC) in America, one of the minimum standards for child care operation permit holder is to have a current record of a tuberculosis examination, depicting TB contagious free status.²³

The testing for TB infection appears a very common day-cares/pre-schools pre-employment requirement that cuts across Low -and middle-income countries (LMIC) and High-income countries (HIC). In the last few years, there have been changes in the rules regarding TB tests. The US centres for Disease Control and Prevention recommends that all childcare staff including the directors and individuals (substitutes/volunteers at the day-cares/pre-schools who work for more than once per week are required to have a negative TB screening or test prior to the first day of work. The test document must have been administered within 12 months before the starting date of employment or volunteer service - signed by a healthcare provider. Annual tests/screenings for TB, dental, visual and hearing impairments are however optional.²⁴

The scope of pre-employment/pre-placement medical screening varies from settings to settings. The tests are usually customized to suit the nature and demand of work in the organization. Generally, day-cares/pre-schools caregivers are screened for educational qualifications, job skills and are required to show evidence of fitness to work. Medical screening entails physical medical examination, declaration of past medical history of mental illness, epilepsy, tuberculosis; carrying out a few serological tests for measles, mumps, rubella (German

measles) and varicella (chickenpox) and screening for tuberculosis. Caregivers need to also show proof of vaccination status for MMR (2 doses) and varicella (chickenpox) (2 doses). In America, vaccines are recommended by state and local public health authorities and Advisory Committee on Immunization Practices ACIP for all adults who work in day-cares/pre-schools settings especially for those in close contact with infants and those who lack evidence of immunity due to either lack documentation of vaccination or no evidence of prior infection). This is because adults often spread pertussis (whooping cough) to vulnerable infants and young children.²⁶

The vaccines include: (1) T-dap/Td (1 dose), (2) Varicellazoster, (3) MMR (measles, mumps, and rubella), (4) influenza (yearly), and (5) Human papillomaviruses (HPV) (eleven through twenty-six years of age). Any other test is based on specific risk factors for pneumococcal; meningococcal, hepatitis B [hepatitis C and syphilis (RPR) test in some settings] and of recent, testing for SARS-CoV-2 infection. In case of vaccine refusals, the guideline as well requires written documentation of reasons (medical, religious or philosophical) for refusal by intending staff.²⁶

The practice is a par with what obtains in other developed countries. In Australia and Singapore, under the Child Care Centres Act and Education Act, new child care, kindergarten and school staff members are required to obtain medical clearances before they commence work, register their staff members online with the medical certification at the Early Childhood Development Agency (ECDA) which conducts random checks to verify the certification. ²⁸ The medical screening of children, teachers, and in particular the minders and nannies who are responsible for the direct care of children is an obligation that helps provide information which when used proactively, can prevent the spread of infections from caregivers to the children or vice versa.

Other health-related tests are a 3 yearly Criminal Background Check (CBC) and drug test. Although, there is a strong debate on the effectiveness of preemployment/pre-placement medical examinations in preventing health risks in occupational settings, the campaign for drug use test in childcare settings appears to have seriously gained traction in favour of caregivers being tested. ^{27,28} Evidence from this study shows that being in childcare settings in which 'pre-employment medical screening is a requirement is significantly associated with adequate DPP. This may be indicative of elevated levels of health consciousness and operations such as having established Standard operating procedures (SOPs) and putting in place systems for disease prevention.

Hand-hygiene

Hand hygiene is cross-cutting issue in day-cares/pre-schools settings. Caregivers are required to wash their hands on getting to work, before and after they come in contact with

the children or surfaces, arranging toys and gadgets, during food preparation and after serving, after handling food or utensils, wiping children's nasal drippings or their own congested noses, cough episodes, after contact with soiled clothing or vomitus and toileting children. Caregivers' self-report of hand hygiene moments showed higher frequency of stool related than food-related hand hygiene moments.

Caregivers' hand hygiene moments after helping children with toileting and after defecation was reported by >80% of the respondents in this study compared with 10%-50% found in older studies conducted in both household and school settings. Despite, the high reporting rate of hand hygiene by day-cares/pre-schools caregivers, the aggregate childcare disease prevention practice score was sub-optimal. So was the weighting on the role of hand hygiene in the overall childcare disease prevention practice score index.

Hand washing is a very important factor in disease prevention and control especially in childcare settings.²⁹ Account from an interventional study gives insight on how caregivers' hand-washing, period of operation of the daycares centres', mean age of children in classrooms were factors significantly associated with diarrhoea. Further evidence is required on the quality of hand hygiene conducted in these settings, availability of hand hygiene infrastructure and constraints to hand hygiene for appropriate interventions.

Food preservation and feeding practices

As an indirect proxy to the feeding practices and nutritional intakes of children, results from this study show that cleaning of surfaces for dishing out food to children and feeding are mostly done with detergents and antiseptic agents at most twice daily. Food packs containing mainly staple foods (rice, 'indomie' noodles, bread, pap, "amala", beans, yam and biscuits) reported more often, were brought in from homes sparingly accompanied with fresh fruits and vegetables. Meals not rich in protein and vegetables supplies or inadequate ratios of macro and micronutrients taken by children in day-cares/preschools have been observed in other day-care settings.30-32 A nation-wide study among preschools in Poland revealed that the children were given non-recommended caloric intake: snacks and cocoa and milk coffee substitutes with sugar.33

From food packaging at homes for pre-schoolers to meal time at day-cares, many at times, the ideal two hours interval for optimal food preservation and safety would have elapsed and likely contamination and proliferation of organisms may have set in. Akitoye and colleagues provide evidence for prolonged storage, poor hand hygiene and contamination process with pap fed to children.³⁴

Poor feeding practices have implications for gastrointestinal disorders or metabolic diseases. Milk-and solid-feeding practices in day-care attendees have been

associated with functional constipation, rotavirus infection in bottle fed children and stunting. ^{6,35,36}

Repeated ingestion of contaminated food or high calorie diet in childhood have been implicated in the development of non-communicable diseases (diabetes, cancers) at older age.^{37,38} At molecular levels, childhood nutritional status depicts differences in bacterial diversity, predominant communities of some particular microorganisms within the gut and as well differences in the metabolic and immune functions of the infant gut microbiome.³⁹

Sub-optimal feeding practices such as force-feeding, tasting or softening children's' food to aid digestion and prevent scorched tongues are thought-provoking and have socio-cultural undertones which unfortunately permeate caregivers' childcare practices. Force-feeding a child is culturally accepted in some communities in Nigeria. 40,41 It is learnt from socialization and some parents even covertly or overtly approve non-biologically linked carers to force-feed their wards. Though, the act is done with good notions bordering on need for medication during ill health and concerns of under-weight, the risks (aspiration pneumonitis, suffocation, asphyxia or death) of force feeding highly outweighs the perceived benefits for both biological and non-biologically linked caregivers. 41

A child's refusal of food might be a pointer to a disease process or psychological disorder. Evidence shows that distractions, lack of encouragement and under-nutrition are common in day-cares/pre-schools settings where there is very low level of socialization between caregivers and children.⁴² Approaches such as regular and inerratic timings for feeding, making the food more colourful, fun eating techniques and warmth can attract an unwilling child to eat. Following a nutritional food fortification intervention in a study, there were increased appetite, food consumption and consequently improvement in the children's nutritional statuses were observed. Absenteeism also reduced. The anaemia observed in 69 (43.2%) of the children decreased to 21% (37) at the end of the study. The proportions of moderately anaemic children 42 (26.3%) with those 27 (16.9%) with severe anaemia reduced to 32 (20.7%) and 5 (3%), respectively.⁴⁴ Adequate nutritional education and rehabilitation for day-care/preschools caregivers can further offer nutritional support in a variety of way to the children under their care particularly children whose mothers are challenged with Exclusive breast feeding (EBF). Such children can benefit from high quality expressed breast milk, probiotic milk and complementary feeding.⁴⁵ Feeding support however prohibits caregivers' pacifying distressed babies by breastfeeding the children. For older children, day-care/pre-school caregivers can advocate for food brought from home to be enriched with fruits and vegetables at least 3 times a week.

Early detection of childhood illnesses and management

Unlike caregivers, parents may not have the interphase while at work to observe changes in the normal dispositions or physical conditions of their wards. A child's withdrawal can be early pointers to a health or health related problem. Awareness of common childhood illnesses through programmes that empower the caregiver types to recognize signs and symptoms of common illnesses in children especially the highly infectious ones will stimulate high sensitivity to detection. ⁴⁶ Early detection of symptoms in day-cares/pre-schools children can facilitate first aid treatment and securing of basic/emergency health services in nearby hospitals for ill-children, decision making for mothers and the provision of valuable information for treatment of ill health because caregivers are often the first to notice warning signs and symptoms of infections in children.

Measles was considered by 687 (86%) the most infectious of the VPDs, followed by tuberculosis (77.6%) and chicken pox (77.0%). A survey on early detection of Acute respiratory infections (ARI), symptom identification of ARI by caregiver was not enough to prompt parents/caregivers' on the need to seek for early treatment. 'Increased breathing' (the simple clinical /community criteria used in identifying more than 80% of children who require antibiotic therapy for bacterial pneumonia) was not linked with the severity of the condition.⁴⁷

In the present study, caregivers do not engage in treating any illness symptom regardless of type and severity of ill health. Whenever symptoms are observed in a child, regardless of whether communicable or non-communicable disease, severe or not, the outstanding practice is for parents to be called to pick up their children or the child is taken home. This practice is in operation in countries like in Sweden, Australia and Malta. 2,48,49 These countries however have supplementary cchildcare response systems for emergencies. Caregivers are mandated to have first aid and Cardio-pulmonary resuscitation (CPR) certifications and are aided in managing ill children with established protocols on the management of a few childhood emergencies.

In response to the COVID-19 pandemic, it becomes even more pertinent to deploy strategies that enhance prevention and control of infectious diseases or any acute severe health conditions particularly those that can cause respiratory distress (COVID-19 infection, pneumonia and asthma). Such preventative practices include hybrid remote learning, reduction of child-caregivers' ratio, assessment of indoor air quality, availability of accurate information/protocols on different aspects of major childhood infections/diseases.²³

Caregivers need to understand the danger signs and symptoms of these conditions to appropriately institute preventive measures and avoid caregivers inadvertently insisting on nose masks for children with respiratory distress. Among other practices, there is also need for established referral path and preparedness for emergencies with regular drills in day-cares/pre-schools settings. This will appropriately inform the exclusion policies, seamless

synchronization of the early detection of illness and release of ill-children for the continuum of the needed care.⁵⁰ Conversely, if a vaccine-preventable disease occurs in the facility and unimmunized adults who are susceptible to that disease are potentially exposed, the health department should be consulted to determine whether these adults should be excluded for the duration of possible exposure or until the appropriate immunizations have been completed.²⁶

Factors affecting childcare disease prevention practices of caregivers

In this study, factors associated with childcare DPP are largely related to the occupational profile of the respondents. Reckoning with the 'Proceed-Precede' model, occupational characteristics are antecedents, predisposing and enabling factors that have been proven to influence health behaviour which in this study is the adoption of good childhood disease prevention measures. Higher educational level, respondents' who received 'Childcare trainings' and have had 'previous affiliation with healthcare' were statistically associated with childcare disease prevention practices. These findings corroborate findings by other authors. ^{5,49,50} Education and trainings on childcare are sustainable disease prevention strategies.

Limitations

Childcare disease prevention practices may have been under or over-reported in this study especially hand hygiene because of social desirability bias. Complementary assessment methods such as facility assessment checklist and observations would have helped in validating some of the findings in this study. Hand hygiene moments assessed were few. Further in-depth study will be instructive.

CONCLUSION

The study situates salient health-related practices of caregivers in day-care/pre-schools settings regarding its importance in infection and disease prevention. The detailed report on gaps and modifiable practices will be relevant as baseline for future comparisons, design of focused interventions for caregivers and policy optimization in day-cares/preschools.

Recommendations

Recommendations are as follows- (a) there should be stricter guidelines for the employment of caregivers and the operations of the schools. Pre-employment medical fitness for operators and caregivers in day-cares and preschools needs to be efficiently coordinated, more exhaustive and mandatory. Health related policies and law enforcement need to urgently and decisively address unhealthy or poor childcare practices such as ban against force feeding in the generally in the country especially in

these settings; (b) scale-up of systematic training interventions on best childcare practices. From this study, a few thematic childcare disease prevention areas that needs to be addressed will include feeding practices, risk communication messages on common childhood infectious diseases and emergency preparedness. This can be achieved by maximizing opportunities provided via the parents-teachers meetings, social media and affiliation with healthcare. These platforms will facilitate interaction and reinforcement of health-related practices/issues to teachers, minders and parents; (c) need for more sustained regulatory and supportive supervisory and surveillance on childcare practices and infections rates in day-care/preschools by relevant stakeholders and this should be guided by findings from operations research; and (d) longitudinal studies and analysis of surveillance report of morbidities from day-cares/pre-schools settings.

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