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Original Research Article

Knowledge, comprehension, attitude to and practice of the five levels of prevention in child healthcare in a Nigerian teaching hospital

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ABSTRACT

Background: Preventive paediatrics involves all activities geared towards protecting, promoting and maintaining the health and wellbeing of children. The aim of this study to determine the knowledge, attitude and practice of the five levels of prevention by child-care doctors at the University of Port Harcourt Teaching Hospital.
Methods: This was a descriptive cross-sectional survey using a self-administered questionnaire. Information on socio-demographics, knowledge, comprehension and attitude of the respondents towards the five levels of prevention and its utilization by the doctors at the University of Port Harcourt Teaching Hospital was sought. Data were analyzed using descriptive statistics.
Results: 295 doctors participated. 26 (8.8%) doctors had good knowledge of the five levels of prevention. As the doctors' age increased, they were less likely to be knowledgeable about the levels of prevention (OR=0.955; 95% CI: 0.917-0.995; p-value=0.029). Doctors in Pediatrics were four times more likely to be knowledgeable about the levels of prevention than the others (OR=3.637; 95% CI: 1.496-8.844; p-value= 0.004). 287 (97.3%) doctors had good attitude towards preventive activities while practice was by 222 (75.3%). There were no significant differences across gender, age, department, designation and years of practice. Doctors with good knowledge significantly practiced more levels of prevention compared to those with poor knowledge (p=0.049, 0.024, 0.001 and 0.010 respectively).
Conclusions: Majority of the doctors have poor knowledge of the five levels of prevention, despite having a good attitude and practice which suggests a knowledge-practice gap. Interventions to improve doctors' knowledge are recommended.

Keywords: Five levels of prevention, Knowledge, Practice, Child healthcare

INTRODUCTION

Preventive pediatrics involves activities geared towards protecting, promoting and maintaining the health and wellbeing of children - for both communicable and chronic non-communicable diseases.[1] There are five levels of prevention.[2,3] Level 1 is general health protection and involves activities aimed at disease prevention in general, identifying risk factors and preventing them.[2,3] Level 2 is specific protection, aimed at protecting against specific diseases.[2,3] Level 3 is early diagnosis and prompt treatment, aimed at detecting diseases early and providing prompt effective treatment.[2,3] Level 4 is limitation of disability and aims at ameliorating/limiting the extent of a disability whether physical, mental, social or psychological.[2,3] Level 5 is Rehabilitation, which lessens the impact of established disability thereby maximizing existing potentials.[2,3] Nigeria's under-five mortality rate remains high necessitating improvements in preventive practices at all five levels.[3-6] Major causes of under-five deaths in Nigeria include; malaria, diarrhea, pneumonia, measles,

malnutrition and prematurity.[2,4] Others include Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) and malignancies. Complications of chronic non-communicable diseases such as sickle cell Anaemia (SCA) are also preventable, with prompt diagnosis and pro-active preventive strategies.[2] A mortality review in the Department of Paediatrics of the University of Port Harcourt Teaching Hospital (UPTH), over a two-year period, revealed preventable diseases (HIV/AIDS 21.2%, pneumonia 15.8%, malaria 9.6% and diarrhea 5.8%) as the major causes of death.[4]

This study seeks to find out the knowledge, attitude and practice of the five levels of disease prevention by doctors who care for children at the hospital. This knowledge will improve childhood morbidity and mortality.

METHODS

This was a descriptive cross-sectional study carried out amongst doctors who care for children at the University of Port Harcourt Teaching Hospital (UPTH), a large tertiary hospital in Nigeria, from June 2016 to September 2016. It included Consultants, Resident doctors, Medical Officers and House Officers in the departments of Paediatrics; as well as Surgery, Dentistry, Ophthalmology, Family medicine, Ear, nose and throat surgery, Community medicine, Mental Health and Accident and emergency. All doctors, a total of 317, who care for children in these departments were eligible.

Exclusion criteria included doctors who did not give consent and those who did not care for children.

A self-administered semi-structured questionnaire consisting of four sections was used to obtain information on socio-demographics, knowledge and comprehension of the levels of prevention, attitude towards prevention and its utilization by the doctors in the course of their duties. For knowledge, a score of ≥50% was graded as good knowledge and <50% was poor knowledge.[7] Attitude towards prevention and responses were graded on a 5-point Likert scale of "strongly agree", "agree", "neutral", "disagree" and "strongly disagree". Variables were divided into binary variables and categorised as "good attitude" or "poor attitude".[8] A score of ≥50% was graded as good attitude and <50% was graded as poor attitude.[7] Practice of the levels of prevention was as affirmed by the doctors. Good practice was defined by a "yes" response while poor practice was defined by a "no" response. Questionnaires were retrieved immediately afterwards to avoid bias. Data were presented as Tables and charts, as appropriate. Quantitative variables such as age and years of practice were expressed using means and standard deviation. Qualitative variables such as sex, designation and department were expressed as frequencies and proportions. Socio-demographic (age category and sex) and work related (department, designation and years of practice) characteristics were compared across knowledge, attitude and practice of prevention levels using Chi square and Fishers exact tests, as appropriate. Level of significance was set at $p < 0.05$. Statistically significant variables were entered into a logistic regression model to adjust for confounders and identify predictors. Odds ratio and 95% confidence interval were determined as measures of association. We received Ethical approval from the ethics committee of the hospital.

RESULTS

A total of 294 doctors participated in the study. There were 148 (50.2%) males and 147 (49.8%) females with a male to female ratio of 1:0.9. Most respondents were ≤40 years (92.6%). The age range was 22-51 years with a mean age of 32.1±7.8 (Table 1).

Table 1: Demographics of the 295-study population.

Variables	N	%
Age (years)		
≤30	140	47.5
31-40	133	45.1
41-50	20	6.8
51-60	2	0.7
Sex		
Male	148	50.2
Female	147	49.8

Table 2: Department, designation and years of practice of the 295 respondents.

Work related characteristics	N	% (100)
Department (n=163)*		
Paediatrics	63	38.7
Accident and emergency	3	1.8
Community medicine	28	17.2
Dentistry	6	3.7
Ear, nose and throat	6	3.7
Family medicine	13	8.0
Mental health	4	2.5
Ophthalmology	9	5.6
Surgery	31	19.0
Designation (n=295)		
Consultant	19	6.4
Senior registrars	61	20.7
Registrars	70	23.7
Medical officers	13	4.4
House officers	132	44.7
Years of practice (n=295)		
5 years and below	174	59.0
6-10 years	60	20.3
Above 10 years	61	20.7

* House officers excluded

Sixty-three (38.7%) respondents were in the department of Paediatrics while 100 (61.3%) were from the other departments. The median number of years of practice among the respondents was 4 years while the range was 1-27 years (Table 2).

Two hundred and sixty-nine (91.2%) doctors had poor knowledge of the five levels of prevention while 26 (8.8%) had good knowledge. As the age of the doctors increased, so did the proportion of those with good knowledge. The difference was statistically significant (p=0.007). The sex distribution of knowledge shows that 18 (12.2%) females had good knowledge of the levels of prevention compared to 8 (5.4%) males. This difference was statistically significant (p=0.038), (Table 3).

Table 3: Knowledge of prevention levels by socio-demographic characteristics.

Variable	Good (%)	Poor (%)	Total (%)
Age (years)			
≤30	6 (4.3)	134 (95.7)	140 (100.0)
31-40	15 (11.3)	118 (88.7)	133 (100.0)
41-50	4 (20.0)	16 (80.0)	20 (100.0)
51-60	1 (50.0)	1 (50.0)	2 (100.0)
Fishers exact test = 11.591; p value = 0.007*			
Sex			
Female	18 (12.2)	129 (87.8)	147 (100.0)
Male	8 (5.4)	140 (94.6)	148 (100.0)
χ^2 = 4.293; p value = 0.038*			

*Statistically significant.

Table 4: Knowledge of levels of prevention by work related characteristics.

Knowledge of levels of prevention			
	Good n (%)	**Poor n (%)**	**Total n (%)**
Department			
Paediatrics	15 (23.8)	48 (76.2)	63 (100.0)
Others	11 (4.7)	221 (95.3)	232 (100.0)
χ^2 = 22.415; p value = 0.0001*			
Designation			
Consultants	4 (21.1)	15 (78.9)	19 (100.0)
Senior registrars	8 (13.1)	53 (86.9)	61 (100.0)
Registrars	6 (8.6)	64 (91.4)	70 (100.0)
Medical officers	1 (7.7)	12 (92.3)	13 (100.0)
House officers	7 (5.3)	125 (94.7)	132 (100.0)
Fishers exact test= 6.968; p value = 0.107			
Years of practice			
5 years and below	10 (5.7)	164 (94.3)	174 (100.0)
6-10 years	6 (10.0)	54 (90.0)	60 (100.0)
Above 10 years	10 (16.4)	51 (83.6)	61 (100.0)
Fishers exact test = 6.266; p value = 0.039*			

*Statistically significant.

Paediatricians who had good knowledge of the five levels of prevention [15 (23.8%)] was more than that of the doctors in the other disciplines, 11 (4.7%). This difference was statistically significant (p=0.0001). The higher the professional rank, the more the proportion of those with good knowledge. The proportion of consultants who had good knowledge of the five levels of prevention was 21.1%, compared to 5.3% of House Officers. However, the differences across the designations were not statistically significant (p=0.107).

Doctors with more years of practice were more knowledgeable about the five levels of prevention compared to those with fewer years of practice. This difference across the years of practice was statistically significant (p=0.039) (Table 4).

As the age of the doctors increased, they were less likely to be knowledgeable about the levels of prevention (Odds Ratio=0.955; 95% CI: 0.917-0.995; p-value=0.029). Doctors in Pediatrics were about four times more likely to be knowledgeable about the levels of prevention than

those in the other specialties (Odds Ratio=3.637; 95% CI: 1.496-8.844; p-value= 0.004). Sex of the doctors was not significantly associated with knowledge of the levels of prevention (Odds Ratio= 1.987, CI: 0.789-5.009, p-value=0.145) (Table 5).

Table 5: Logistic regression analysis of factors associated with knowledge of levels of prevention among the doctors in the study.

Independent variables	Coefficient (β)	Odds ratio	95% Confidence interval		P-value
			Upper	Lower	
Increasing age	-0.046	0.955	0.917	0.995	0.029*
Sex					
Female	0.687	1.987	0.789	5.009	0.145
Male [R]		1			
Specialty					
Paediatrics	1.291	3.637	1.496	8.844	0.004*
Others [R]					
Constant	2.892	18.029	-	-	0.0001

*Statistically significant, R – Reference category

Table 6: Attitude towards the levels of prevention by Socio-demographics.

Attitude towards level of prevention			
	Good n (%)	**Poor n (%)**	**Total n (%)**
Age (years)			
≤30	135 (96.4)	5 (3.6)	140 (100.0)
31-40	130 (97.7)	3 (2.3)	133 (100.0)
41-50	20 (100.0)	0 (0.0)	20 (100.0)
51-60	2 (100.0)	0 (0.0)	2 (100.0)
Fishers exact test= 1.738; p value = 0.852			
Sex			
Male	145 (98.0)	3 (2.0)	148 (100.0)
Female	142 (96.6)	5 (3.4)	147 (100.0)
χ^2 = 0.528; p value = 0.467			

Table 7: Attitude towards level of prevention by work related characteristics.

Attitude towards prevention levels			
	Good n (%)	**Poor n (%)**	**Total n (%)**
Department			
Paediatrics	62 (98.4)	1 (1.6)	63 (100.0)
Others	225 (97.0)	7 (3.0)	232 (100.0)
χ^2 = 0.3840; p value = 0.5355			
Designation			
Consultants	18 (94.7)	1 (5.3)	19 (100.0)
Senior registrars	58 (95.1)	3 (4.9)	61 (100.0)
Registrars	69 (98.6)	1 (1.4)	70 (100.0)
Medical officers	13 (100.0)	0 (0.0)	13 (100.0)
House officers	129 (97.7)	3 (2.3)	132 (100.0)
Fishers exact test = 2.680; p value = 0.585			
Years of practice			
5 years and below	169 (97.1)	5 (2.9)	174 (100.0)
6-10 years	58 (96.7)	2 (3.3)	60 (100.0)
Above 10 years	60 (98.4)	1 (1.6)	61 (100.0)
Fishers exact test= 0.429; p value = 0.893			

Table 8: Practice of levels of prevention by Socio-demographic characteristics of the respondents.

Practice of levels of prevention			
	Yes n (%)	**No n (%)**	**Total n (%)**
Age (years)			
≤ 30	106 (75.7)	34 (24.3)	140 (100.0)
31-40	101 (75.9)	32 (24.1)	133 (100.0)
41-50	14 (70.0)	6 (30.0)	20 (100.0)
51-60	1 (50.0)	1 (50.0)	2 (100.0)
Fishers exact test = 1.587; p value = 0.677			
Sex			
Female	112 (75.7)	36 (24.3)	148 (100.0)
Male	110 (74.8)	37 (25.2)	147 (100.0)
χ^2 = 0.028; p value = 0.893			

Table 9: Respondents' practice of levels of prevention by work-related characteristics.

Practice of levels of prevention			
	Yes n (%)	**No n (%)**	**Total n (%)**
Department			
Paediatrics	43(68.3)	20 (31.7)	63 (100.0)
Others	179 (77.2)	53 (22.8)	232 (100.0)
χ^2 = 2.108; p value = 0.147			
Designation			
Consultants	12 (63.2)	7 (36.8)	19 (100.0)
Senior registrars	42 (68.9)	19 (31.1)	61 (100.0)
Registrars	52 (74.3)	18 (25.7)	70 (100.0)
Medical officers	10 (76.9)	3 (23.1)	13 (100.0)
House officers	106 (80.3)	26 (19.7)	132 (100.0)
Fishers exact test = 4.312; p value = 0.361			
Years of practice			
5 years and below	134 (77.0)	40 (23.0)	174 (100.0)
6-10 years	41 (68.3)	19 (31.7)	60 (100.0)
Above 10 years	47 (77.0)	14 (23.0)	61 (100.0)
Fishers exact test = 2.962; p value = 0.228			

Two hundred and eighty-seven doctors (97.3%) had a good attitude while 8 (2.7%) had a poor attitude. All the doctors aged 41-50 years (100%), had a good attitude towards prevention compared to 135 (96.4%) of those aged ≤30 years. The differences in proportions were not significant (p=0.852). The sex distribution of attitude shows that 145 (98%) males had a good attitude towards prevention compared to 142 (96.6%) females. The differences in proportions were not statistically significant (p=0.501), (Table 6).

Almost all the doctors (>95%) in all the specialties had a good attitude towards prevention. The difference in proportion between the doctors in Pediatrics and the other disciplines was not significant (p=1.000). This finding of a very high level of good attitude was also seen across the designations and years of practice of the respondents (Table 7).

Two hundred and twenty-two (75.3%) doctors routinely practiced preventive activities. The proportion of doctors aged 31-40 years who practiced the levels of prevention was 101 (75.9%) compared to 50% of doctors aged 51-60 years as shown in Table 8. The difference was not significant (p=0.677). The proportion of doctors who practiced the levels of prevention was similar across the sexes (Table 8).

Sixty-eight-point three percent (68.3%) of doctors in Pediatrics practiced the levels of prevention compared to 77.2% of doctors in other departments. The differences in proportions were not significant (p=0.147). More than 60% of the doctors in all the designations practiced the levels of prevention. The higher the professional ranking, the less likely they were to practice the levels of prevention, with House officers having the highest proportion (80.3%) of those who practiced it. However, the differences in proportions were not significant (p=0.320). Concerning years of practice, the proportion

of those who practiced the levels of prevention was similar across all the years of practice (Table 9).

A cross analysis of doctors with good/ poor knowledge and their practice of the five levels of prevention revealed that doctors with good knowledge practiced each of the levels of prevention more compared to those with poor knowledge. Counselling on environmental sanitation was practiced by 23 (88.5%) out of 26 respondents who had good knowledge, compared to 189 (70.3%) out of 269 of those who had poor knowledge. This difference was statistically significant, p=0.049.

DISCUSSION

This study revealed that only 8.8% of doctors who care for children in the hospital had good knowledge of the five levels of prevention. Doctors aged 31-40 years, those who had practiced for less than 5 years and more than 10 years, and those in Pediatrics department constituted a major proportion of those with good knowledge. This contrasts with studies by Anastasi et al and del Burgo Fernández et al who found a higher level of knowledge of prevention (42.3% and 29.9% respectively).[9,10] These differences in results may be explained by the differences in methodology as the present study explored all five levels and involved doctors who cared for children. However, Anastasi et al explored knowledge in level 2 among Pediatricians while del Burgo Fernández et al included all category of health workers.[9,10] This poor knowledge of the levels of prevention by the doctors in our study is surprising, as it is expected that their undergraduate and postgraduate training curriculum ought to have included all aspects of prevention. This poor knowledge may also suggest a deficiency in the incorporation of preventive aspects of diseases in the training curriculum of undergraduates and postgraduate doctors, or faulty implementation of the contents of the curriculum.

Sub-analysis of those with good knowledge showed that females, doctors in Pediatrics department and doctors aged 31-40 years constituted a major proportion of those with good knowledge. Similarly, Anastasi et al in Italy also found that female Pediatricians were more knowledgeable about immunization, though they had a slightly higher proportion of female respondents; compared to the present study that had a more equal sex distribution.[9] Multivariate logistic regression analysis of those with good knowledge in this present study revealed that only department and age were predictors of good knowledge. With increasing years of practice, doctors were more likely to have good knowledge of the levels of prevention. These observations may suggest a more robust content of or effective implementation of preventive medicine in the training curriculum of Pediatrics compared to other specialties; and, possibly, that as doctors grow in their practice (for those more than 10 years), they acquire more experience with preventive activities. However, the general low level of knowledge by the doctors can have negative implications on childhood morbidity and mortality in Nigeria as majority of causes of childhood diseases are preventable.[4,11-13]

Majority of the doctors (97.3%) had a positive attitude towards disease prevention. There was no significant difference in attitude across socio-demographic and work-related indices of the respondents. Carter et al and Prakash et al reported similar results among General practitioners (GPs) in the UK and Paediatricians in Canada.[14,15] In contrast, Walter et al found that fewer GPs (62.5%) had a good attitude towards preventive measures among the elderly.[16] The reason for this attitudinal difference between the present study and that of Walter et al might be due to the different patient populations catered for by the respondents; all specialties that tend to children versus geriatricians.16 That most doctors have a positive attitude towards prevention might suggest that better training may improve practice. The high level of positive attitude towards prevention among doctors in this study should be harnessed as it might indicate a willingness to accept interventions aimed at improving their knowledge of the levels of prevention for better practice.

Analysis of the practice of the five levels of prevention by the doctors revealed that up to three-quarters of respondents (75.3%) had good practice. This is similar to findings by Anastasi et al in Italy, and Szilagyi et al in the USA among Paediatricians.[9,17] This high level of reported practice in the index study appears to contradict the poor level of knowledge (8.8%). This finding is important because it implies that possibly some of the doctors were carrying out preventive activities without recognizing it as such; or, that there is a failure to link or recognize the definitions and theoretical knowledge of the levels of prevention as stated in this study and standard textbooks, to practical application in different clinical scenarios. Continuing medical education on disease prevention and preventive activities may serve to bridge this gap.[1,5,18-20] Comparative sub-analysis of "practice" showed that doctors with good knowledge routinely utilized opportunities for practice of preventive activities across each of the five levels more than those with poor knowledge. Walsh et al also found that Physicians who felt they had adequate knowledge were more likely to ask their patients about preventive activities like exercise and counsel on it.[21] In contrast to this study, Nwaneri et al, in Nigeria, revealed lower level of preventive practice amongst doctors in Benin; as only 19% of parents surveyed affirmed that they received information from their doctors on specific prevention (level 2) of the disease for which their child was admitted.22 However, this low level of practice might be because the parents may underreport their contact contents with doctors, while doctors (who are the focus of the present study) may exaggerate their level of practice of disease prevention with their patients.

It is recommended that more effective training on disease prevention should be institutionalized at the hospital among doctors who care for children to improve knowledge, through regular workshops and Continuing Medical Education. Their practice of preventive activities can be improved by implementing standard operating procedures and protocols which are routinely communicated to them.

A limitation of this study is that it is based on self-reporting and the respondents may have provided responses they thought the researcher expected. Also, the practice of prevention might have been better appreciated if directly observed by the researcher, making a qualitative operational study for this research question invaluable.

CONCLUSION

In conclusion, this study has revealed a low level of knowledge and a high level of good attitude and practice of the levels of prevention by doctors caring for children in our study. With increasing years of practice, doctors were more likely to have good knowledge. Doctors in Pediatrics were four times more likely to be knowledgeable about the levels of prevention than those in the other specialties. Doctors with good knowledge utilized opportunities for practice of preventive activities across each of the five levels more than those with poor knowledge. An improvement of doctors' knowledge is necessary, as this will further improve their practice and reduce childhood morbidity and mortality.

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