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IMMUNIZATION STATUS AMONG UNDER 5 CHILDREN – OBSERVATIONAL STUDY IN A TERTIARY HEALTH CARE CENTER.

Pediatrics

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ABSTRACT

Background: Immunization is one of the most cost-effective public health interventions to prevent the transmission of vaccine preventable disease and decrease childhood morbidity and mortality.
OBJECTIVE : 1. To estimate the immunisation status among under 5 children. 2. To identify the prevalence of vaccine hesitant parents using Parental Attitudes towards Childhood Vaccinations (PACV) survey and analyse the demographic factors associated with vaccine hesitant parents.
Methods and Analysis: A cross sectional observational study was carried out in children aged 1 to 5 years attending Outpatient department (OPD) and Inpatient department (IPD) at RL Jalappa Hospital , Kolar from May 2021 to July 2021. Data was collected by direct interview of parents by the primary investigator and review of medical records using internally validated pre designed questionnaire. Descriptive Data was analyzed for percentages and qualitative variables were tested using Fischer exact test.
Results : Out of 200 cases, 85.5% of the cases were fully immunized, 14.5% of the cases were dropouts. Rate of vaccine hesitancy were 56% and 89% among fully immunized and dropout children. Overall vaccine hesitancy is 61%.
Conclusion : 61% of parents were found to be vaccine hesitant using PACV15 scale. Vaccine hesitancy is high among dropouts (89%). Majority of Vaccine hesitancy was seen among mothers who are low educational qualifications, unskilled laborers, poor socioeconomic status, female child, first order child. Hence, focus on education of these high risk groups will help in improving the immunization status.

KEYWORDS

PACV, Vaccine hesitancy, Immunization, Children, Under 5

INTRODUCTION

Immunization is one of the most cost-effective public health interventions to prevent the transmission of vaccine preventable disease and decrease childhood morbidity and mortality. [1]

As per National Family Health Survey 4 (NFHS 4) report, only 64.8 % of children in Karnataka were estimated to be fully immunized.[2] Around 53.9 % of children's received immunization at Anganwadi center, & 39.1 % at government health facilities , 7% in private health facilities at rural area and 35.2% of children failed to receive all basic vaccines in the first year of life in 2018 in Karnataka.[2]

In the Anganwadi based study of 400 children between 3-6 years done in 2018 by Dhananjaya and colleagues in Kolar, found 86% of children to be fully immunized .[3] The most common reasons for not immunizing the child were current illness , time and place not known for vaccination and fear of side effects, low maternal educational qualification, lower socioeconomic class and religion.[3]

Health care system in India was in massive stress due to Covid 19 pandemic ,which led to temporary cessation of national health programmes including immunization due to manpower shortage, lockdown induced difficulty in transport services and apprehension among the public to visit health care centers. Although the immunization services are resumed, impact of the pandemic related disruption on immunization of children and the parental concerns regarding the immunization are not known.[4]

Vaccine hesitancy has been defined by World Health Organization (WHO) as "delay in acceptance or refusal of vaccines despite availability of vaccination services". Vaccine hesitancy is a dangerous global trend and WHO has listed it as one among the top 10 threats to global health. Vaccine hesitancy is complex and context specific varying across time, place and vaccines. Factors influencing parents decisions to delay or refuse vaccinations for their children are lack of trust in government, vaccine researchers, the vaccine industry, fear around safety and efficacy of vaccines, inadequate health infrastructures, shortages of health providers, vaccine shortages.[5]

Parent Attitudes about Childhood Vaccines (PACV) is a valid and reliable tool to analyses the attitudes, behavior and beliefs of parents towards immunization.[6]

In a study done by Sahana and colleagues in 2018 at Chennai using PACV survey, it was observed that there was a tendency of suspicion toward introduction of newer vaccines in 61.4% of the sample, concerns about adverse events following vaccination in 90.7%, a feeling that vaccines were not necessary for uncommon diseases in 85.3% and a high level of vaccine hesitancy in 5.3%.[7]

In a study done by Patel A and colleague in 2019 at 8 urban slums of Bengaluru Rural District, vaccine hesitancy was present among 75% of the primary care givers. Main Reasons for vaccine hesitancy reported were fear of vaccination side effects, sickness of child, unaware of availability of vaccines, felt unnecessary to get child vaccinated.[8]

Hence this study is being planned to estimate the current immunization status among under 5 children and to understand the parental attitudes towards immunization using PACV survey scale.

OBJECTIVES

1. To estimate the Immunisation status among under 5 children.
2. To identify the prevalence of Vaccine hesitant parents using PACV survey and analyse the demographic factors associated with vaccine hesitant parents.

MATERIALS AND METHODS

Study design:
Cross – Sectional Observational Study

Source of data:

All under 5 (1 – 5 years) children attending pediatrics Outpatient department(OPD) or Inpatient department(IPD) at RL Jalappa Hospital were enrolled during study period

Study period- 3 months, May 2021 – July 2021

Method of collection of data:

INCLUSION CRITERIA: All under 5(1 – 5 years) children attending pediatrics OPD or IPD at RL Jalappa Hospital were enrolled during study period .

EXCLUSION CRITERIA:

- Refusal for written consent.
- Absence of immunization card .
- Children admitted to Pediatrics Intensive Care Unit.

METHODOLOGY

Study was started after obtaining institutional ethical committee permission. Parents of all children satisfying inclusion and exclusion criteria were approached and data was collected by direct interview method and review of medical records after obtaining written informed consent .

Children were categorized into fully immunized, dropouts and leftouts according to Ministry of Health and Family Welfare(MOHFW) Guidelines.[9]

Immunization status is defined as :

"Fully immunized: children who had received three doses of diphtheria, tetanus, pertussis (DPT), and OPV each and single dose of BCG and measles vaccine .

Dropouts: are children who receive one or more vaccinations but do not return for subsequent dose.

Leftouts :are children and women who do not utilize the immunization services for reasons including lack of knowledge, trust in immunization services or geographic and other reason.[9]"

PACV Scale is a validated and reliable self administered survey containing 15 items. It has a mean scoring time of 1 minute. Item scores were summed in an unweighted fashion to obtain a total raw score. The total raw score is converted to a scale ranging from 0 to100 using simple linear transformation and accounting for missing data . Vaccine for missing data. Vaccine hesitant parents are indicated by a PACV score ≥50.[6]

STATISTICALANALYSIS

Data were analyzed using SPSS 22 version software. Quantitative data were analysed using percentages. The association between vaccine hesitancy and sociodemographic variables were tested by using Fischer exact test. P value <0.05 was considered as statistically significant.

RESULTS

As shown in fig1, study population consists of 85.5% (171) fully immunized and 14.5% (29) dropout children. Vaccine hesitancy among fully immunized and dropouts were 56% and 89% respectively. Overall vaccine hesitancy observed is 61%.

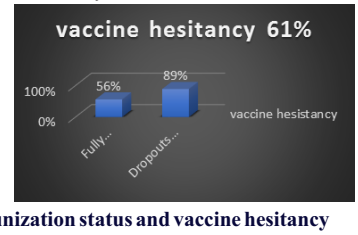

Fig 1 –Immunization status and vaccine hesitancy

Table 1 represents the analysis of various demographic factors associated with vaccine hesitancy.

Variable	Total Number of cases (n=200)	Vaccine hesitancy status		P value
Age		Present (n=122)	Absent (n=78)	
1 – 2 years	87 (43.5%)	64(73.5%)	23 (26.4%)	0.001
>2 – 5 years	113 (56.5%)	58 (51.3%)	55 (48.6%)	
Gender				
Male	108 (54%)	49 (45.3%)	59 (54.6%)	<.0001
Female	92 (46%)	73(79.3%)	19 (20.6%)	
Mother education				
Illiterate-Primary school	126 (63%)	79 (62.6%)	47 (37.3%)	0.791
Middle- high school	49 (24.5%)	28 (58.3%)	21 (42.8%)	
Intermediate - Graduate	25 (12.5%)	15 (60%)	10 (40%)	
Occupation of mother				
Home maker	119 (59.5%)	83 (69.7%)	36(30.2%)	0.006
Unskilled	48 (24%)	25 (52%)	23 (47.9%)	
Skilled	33 (16.5%)	14 (42.4%)	19 (57.5%)	
Socio economic status				
I	8 (4%)	4 (50%)	4 (50%)	0.861
II	14 (7%)	8 (57.1%)	6 (42.8%)	
III	84 (42%)	52 (61.9%)	32 (38%)	
IV	60 (30%)	39 (65%)	21(35%)	
V	34 (17%)	19 (55.8%)	15 (44.1%)	
Place of delivery				
Home	4 (2%)	3 (75%)	1 (25%)	<.0001
Government	112 (56%)	85 (75.8%)	27 (24.1%)	
Private	84 (42%)	34(40.4%)	50 (59.5%)	
Birth order				
1 degree	106 (53%)	79 (74.5%)	27 (25.4%)	0.0001
2 degree	68 (34%)	28 (41.1%)	40 (58.8%)	
3 degree /higher	26 (13%)	15 (57.6%)	11 (42.3%)	
Vaccine center				
Government Referral center/FRUs	98 (49%)	76 (77.5%)	22 (22.4%)	<.0001
Government PHCs	18 (9%)	16 (88.8%)	2 (11.1%)	
Private	84 (42%)	30 (35.7%)	54 (64.2%)	
Vaccine administered				
Nurse	176(88%)	112(63.6%)	64 (36.3%)	0.008
Doctor	24 (12%)	10 (41.6%)	14 (58.3%)	
Optional vaccine				
Yes	48 (24%)	28 (58.3%)	20 (41.6%)	0.664
No	152 (76%)	94 (61.8%)	58 (38.1%)	

Age

Vaccine hesitancy among 1-2 year children is 73% , whereas among 2-5years children, it is 51% with significant p value.

Gender distribution

Vaccine hesitancy observed in boys and girls are 45% and 79% respectively with significant p value.

Mother education

Vaccine hesitancy among different maternal educational status is between 58-63% with no significant correlation.

Mother occupation

Home makers are observed to have high (68%) vaccine hesitancy when compared to unskilled (52%) and skilled (42%) workers.

Socio economic status

Vaccine hesitancy among different socioeconomic status is observed in the range of 50-65% with no significant correlation.

Place of delivery

Significantly high vaccine hesitancy is observed among children born in government hospitals (75%) when compared to private hospitals(40%).

Birth order

Vaccine hesitancy is found to be higher in first born (74%) children when compared to second (41%) and third (57%) order children.

Vaccine center

Vaccine hesitancy is relatively low in children receiving vaccines at private hospitals (35%) when compared to government primary health care centers (88%) and referral units (77%).

Vaccine administered
Study population contains 88% of children who received vaccines by nurse and 12% of children received by doctor. Vaccine hesitancy observed among them are 63% and 41% respectively.

Optional vaccine
Majority (76%) of the study population had not opted for optional vaccines. Parental choice for giving optional vaccine doesn't affect vaccine hesitancy status as observed vaccine hesitancy is around 58-62% for both groups.

DISCUSSION

The present study was done to assess the immunization status in children aged 1 to 5 years attending health care facility and factors influencing vaccine hesitancy using PACV score. In our study, children with full immunization is 85.5%, which was comparable to anganwadi based study done by Dhananjaya et al in 2018 (86%) [3]. However, Hospital based study done by us cannot be compared with anganwadi based study and there could be a possibility of selection bias due to change in methodology. However, observed frequency of fully immunized children is higher than that measured in NFHS4 (56%) for Karnataka state [2]. Although there was a disruption of immunization services, accessibility to health care due to pandemic induced lockdown measures, observed frequency of children with full immunization is high.

Overall vaccine hesitancy observed in our study is 61% which is significantly higher than that observed in the study done by Sahana and colleagues in 2018 at Chennai [6]. Similarly high vaccine hesitancy was observed in Bangalore rural district by Patel A and colleague's [8] in 2019, however they have not used PACV survey.

Vaccine hesitancy is observed to be significantly higher among parents of children belonging to younger age (1-2 years), female children, first born children, homemakers, children born in and receiving vaccines at government centers. These high risk groups needs to be focused by policy makers to address their concerns in order to prevent spread of vaccine preventable disease.

Limitation of the study – It is a hospital based study which may have inherent selection bias. As per authors knowledge, there are no prior studies in India using PACV 15 survey scale and hence couldn't be compared.

CONCLUSION :

Study shows the frequency of children with full immunization (85.5%) is higher than the state average 64.8%) and not decreased following pandemic. It also shows high percentage (61%) of parents to be vaccine hesitant using PACV15 scale and identifies the various high risk sociodemographic factors associated with vaccine hesitancy.

Recommendations
Vaccine hesitancy is a global phenomenon which may reverse the achievements of vaccination. Identifying people with vaccine hesitancy and vaccine refusal behaviors, listening to their queries is useful in identifying the information to be targeted at public in order to improve the vaccine uptake, thereby maintaining herd immunity. Hence further studies should be done to validate the utility of simple tool like PACV 15 survey scale for measuring Vaccine hesitancy.

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