

FACTORS ASSOCIATED WITH VACCINATION STATUS OF CHILDREN AMONG FEMALES OF CHILD BEARING AGE

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ABSTRACT

Background and Objectives: Childhood immunization is an imperative step in determining a disease-free posterity. There are many factors which are associated with inadequate vaccination coverage in children less than two years in Pakistan. The present study was designed to identify the vaccination status, and factors associated with vaccination status of last born children among the females of child bearing age.

Methods: This was a cross-sectional study in which 400 females of child bearing age were inter-viewed from community of Nishat colony and Shadman Lahore through convenient sampling technique, from January to August 2016. The data was collected through a pre-tested, self-administered structured questionnaire. The females were asked question pertaining to their sociodemographic profile and vaccination status and the factors associated with the vaccination status of their last-born child. The data compilation and analysis was done by using SPSS version 21. The ethical consideration both personal and institutional were duly taken.

Results: Majority of female were between 29-39 years of age with education up to matric and were house wives with family income of less than rupees 25,000 per month. Out of the total participants, 104 (26%) last born children in Nishat Colony while 296 (74%) in Shadman were fully vaccinated. Full vaccination status was significantly associated with maternal education, joint family system, media and mobile team involvement and near-by primary health care center ($p < 0.05$).

Conclusion: The full vaccination status of children is significantly associated with maternal education, family support, cost effective health facility provided by primary health care centers near to place of residence. The media and mobile team are playing a vital role in making effective vaccination awareness among people.

Keywords: Vaccination status, education, joint family system, media.

INTRODUCTION

Immunization is an imperative step in determining a disease-free posterity.¹ Childhood immunization is seen as one of the most important indicators of health leading to a healthful childhood.² It protects children against major childhood diseases like TB, pertussis, polio and measles with an estimation to avert millions of deaths and cases of disability worldwide.¹

According to Pakistan Democratic Health Survey (PDHS) statistics, national vaccination coverage of Pakistan is up to 53.8% and our home land is lagging behind the statistic of countries like Bangladesh and Sirilanka². It is very promising that fraction of children not receiving any kind of vaccination has declined from 28% to 5% between 1990-2007.² Still in our country, one in every 11 born dies before their first birthday making the child mortality rate up to 87 per thousand live births which is more than double of which can be seen in western world.²

Immunization is not only one of the most effective indicators, to determine the results on health outcomes and services spread across social and economic groups, but also one of the most cost-effective interventions to avoid a series of major illnesses especially in environments where children are undernourished and die from preventable, communicable diseases.³ Given the extreme advantages of immunization, any misconception in Knowledge, Attitude and Practices are a cause of serious policy concern which is supported by the fact that there are inequities in childhood immunization.⁴ Pakistan launched its Expanded Program Immunization in 1978.¹ It aims to immunize all children against nine vaccine-preventable diseases which also include now hepatitis B (2002) and Hemophilus influenza type b (Hib) (2008)⁵, Pneumococcal Conjugate Vaccine (PCV) in 2012⁶, IPV in 2015⁷ and Rota vaccine in 2016.⁸

Among the different determinants, which have led

to decrease immunization coverage in countries like Pakistan, education of both parents plays a pivotal role.⁷ Inclusive to this especially maternal education plays a significant role in child mortality.⁹ It has been documented that if parents receive valuable information pertaining to the immunization of their children they will make an effort to avail it.⁹ In many rural areas, people due to lack of education, do not allow their women go out which is making the vaccination coverage a failure.⁹⁻¹²

In Khyber Pakhtun Khawa province of Pakistan, only 65% of under three year olds are fully immunized. The reasons for this poor coverage with the EPI schedule were: mother too busy, absence of vaccination centers, birth order, female gender and hard-to-reach places.¹³ The basic health units are not equipped. Due to law and order situation in Pakistan the mobile teams are facing many difficulties in providing the specific protection at the door steps.¹³

Among many factors, support and income of the family play an important role in making the vaccination coverage universal.³ Big interwoven households support each other and helps in decision making.⁴ The utilization of the preventive service can only be made successful by making the primary health care system in Pakistan strong whereby provision of cost effective vaccination to masses can help in changing the attitude of people.¹³

Mother's health seeking actions and education for making good health choices for herself as well as for

her children can only make the vaccination status of her children upto the mark.⁷ Moreover, print and social media can enhance knowledge on health-related issues and can bring about changes in health services utilization, awareness among the people through planned and organized media information campaigns.¹⁴⁻¹⁷

The rationale of this study to determine the vaccination status and factors associated with it in last born child of females of child bearing age. This study will help to identify gaps in effective immunization coverage due to determinants of immunization which in turn will help us to find out the reasons of ineffective coverage in developing countries like Pakistan.

MATERIAL AND METHODS

This cross-sectional study was conducted in community of Nishat colony and Shadman Lahore, where 400 females of child bearing age were interviewed through convenient sampling technique, from January 2016 to August 2016. The sample size had been calculated by using WHO software version 2.0.21. The data was collected from the mothers with children of age up to 2 years or less living in Nishat Colony and Shadman through a pre-tested self-administered structured questionnaire and who had given the consent to participate in the research. The interviewed females were asked question pertaining to their sociodemographic profile like age, education status, occupation, family income and the factors associated with the vaccination status of their last-born child. Completed questionnaires were entered in the computer software SPSS version 21 through which frequencies of different variable were determined. In order to determine the association between different variables, chi-square test was used by keeping the p value significant at less than 0.05. Approval for conducting the research had been taken from Fatima Memorial Hospital (FMH) Institutional Review Board (IRB). An Informed consent had been taken from all the participants. It was made sure by the investigator that the confidentiality of all the participants had been maintained.

RESULTS

Majority of the female had age falling in the age categories between 18-39 years (Table 1). Almost half of the participants and their spouses in both settings had an education up to matric (Table 1) and their children were fully immunized (Table 2) (p<0.008). Moreover, majority of the females interviewed in Nishat colony 146 (73%) and Shadman 155 (78%) were house wives (Table 1), with family income less than rupees 25,000 per month (Table 1). Out the total participants, 133 (67%) last born children in Nishat Colo-

Table 1: Sociodemographic profile of the participants.

Sociodemographic Profile of the Participants	Nishat Colony n (%) 200 (50)	Shadman n (%) 200 (50)
Age(years)		
18-28	76 (38)	82 (41)
29-39	104 (52)	95 (47)
40-45	20 (10)	23 (12)
Education of spouse of participants		
Illiterate	45 (22.5)	22 (11)
Up to matric	82 (41)	76 (37)
Intermediate	38 (19)	41 (20.5)
Graduate /postgraduate	35 (17)	61 (30)
Education of participants		
Illiterate	40 (20)	30 (15)
Up to matric	93 (46)	75 (38)
Intermediate	37 (18.5)	33 (16.5)
Graduate/postgraduate	30 (15)	62(31)
Occupation		
House wives	146 (73)	155 (78)
Government Employed	10 (5)	19 (9.5)
Self Employed	44 (22)	26 (13)
Income (rupees/month)		
< 25,000	141 (70)	100 (50)
>25,000	59 (30)	100 (50)

ny while 163 (40%) in Shadman were fully vaccinated. More than half of female interviewed in Nishat colony and 27 (73%) (Table 3) of the female interviewed Shadman were living in joint family system (Table 3) and was significantly associated with full vaccination status of their last born child (Table 3). Out of the total females interviewed in Nishat colony 72 (55%) and Shadman 62 (38%) (Table 3) declared that they are getting their children immunized from the nearby health care facility ($p < 0.001$). Females interviewed at both sett-

ings declared that media (Table 3) and mobile vaccination teams (Table 3) were playing vital role in dissemination of information and provision of vaccine at their door step ($p < 0.001$). Regarding the perception about the diseases 355 (88.8%) considered Polio, 293 (73.3%) said Measles and 266 (66%) declared Tuberculosis (TB) were prevented by the vaccination (Figure 1). Moreover, the most important misconception regarding the vaccination was that it can cause side effects (Figure 2).

Table 2: The relation between education of the participants and spouse and vaccination status of the last born child.

Education of the participants From	Nishat colony n (%) 200 (50)				Shadmann (%) 200 (50)			
	Partial Immunized n (%) 67 (33)	Fully Immunized n (%) 133 (67)	X ²	p-value	Partial Immunized n (%) 37 (35)	Fully Immunized n (%) 163 (40)	X ²	p-value
Illiterate	31 (46)	9 (68)	48.1	0.000	11 (30)	19 (12)	11.9	0.008*
Up to Matric	26 (39)	67 (50)			13 (35)	62 (38)		
Up to intermediate	3 (5)	34 (26)			1 (3)	32 (20)		
Graduate/postgraduate	7 (11)	23 (17)			12 (32)	50 (31)		
Education of the participant's spouses			40.4	0.000			3.9	0.27
Illiterate	32 (48)	13 (10)			7 (19)	15 (9.2)		
Upton Matric	24 (36)	58 (44)			15 (41)	61 (37.4)		
Upton intermediate	5 (8)	33 (25)			5 (14)	36 (22)		
Graduate/postgraduate	6 (9)	29 (22)	10 (27)	51 (31)				

*p value ≤ 0.05 showing significant results

Table 3: The relation between different determinants and the vaccination status of the last born child.

Income (per Month)	Nishat colony n (%) 200 (50)				Shadman n (%) 200 (50)			
	Partial Immunized n (%) 67 (33)	Fully immunized n (%) 133 (67)	X ²	P-value	Partial Immunized n (%) 37 (35)	Fully immunized n (%) 163 (40)	X ²	p-value
$\leq 25,000$	56 (84)	85 (64)	8.2	0.003	27 (73)	73 (45)	9.5	0.002*
$\geq 25,000$	11 (16.4)	48 (36)			10 (27)	90 (55)		
Type of family			5.8	0.05			7.4	0.03*
Nuclear	23 (34)	60 (45)			7 (19)	60 (37)		
Joint	38 (57)	70 (53)			27 (73)	100 (61)		
Three generation	6 (9)	3 (2.3)	3 (8)	3 (1.8)				

Source of vaccination Government hospital	27 (40)	42 (32)	2.89	0.235	25 (68)	51 (31)	16.8	0.000*
Private hospitals	12 (18)	18 (14)			5 (14)	50 (31)		
Primary Health care center	28 (42)	72 (55)			7 (19)	62 (38)		
Distance of health care facility Far	30 (45)	30 (23)	10.4	0.001	10 (27)	22 (14)	4.1	0.04*
Near	37 (55)	103 (77)			27 (73)	141 (87)		
Role of Media Yes	44 (66)	116 (87)	12.9	0.000	30 (81)	144 (88)	2.6	0.000*
No	23 (34)	17 (13)			7 (19)	17 (10.4)		
Role of mobile teams Yes	44 (66)	116 (87)	12.9	0.000	30 (81)	144 (88)	2.6	0.000*
No	23 (34)	17 (13)			7 (19)	17 (10.4)		

*p value ≤ 0.05 showing significant results

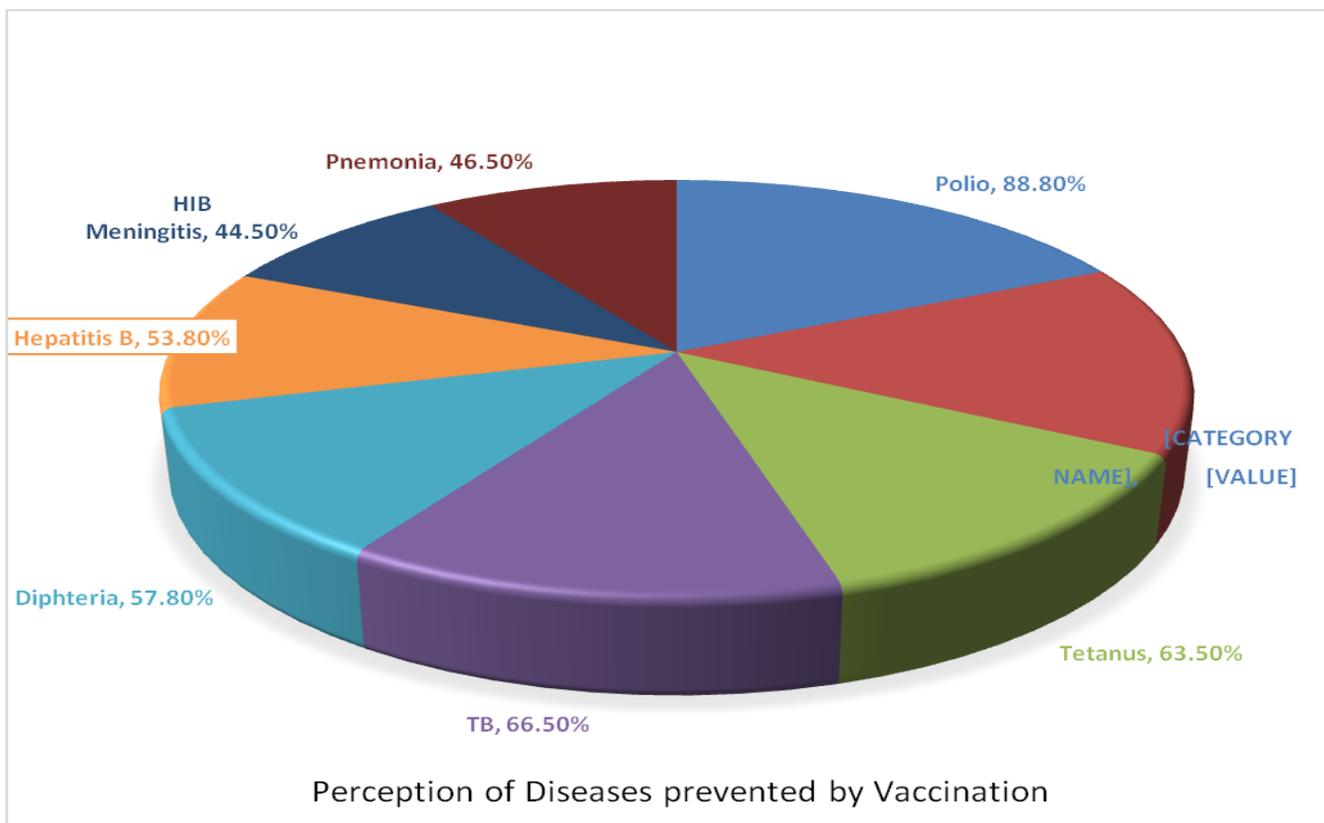


Fig. 1: Frequency distribution of the perception of Diseases prevented by Vaccination.

DISCUSSION

The aim of the study was to determine different determinants affecting the vaccination status. Out of these, education of the couple especially mother's education

plays a vital role especially in country like Pakistan, where factors like political instability, scanty utilization of the preventive services, law and order situations, poor expenditure on health improvement are making

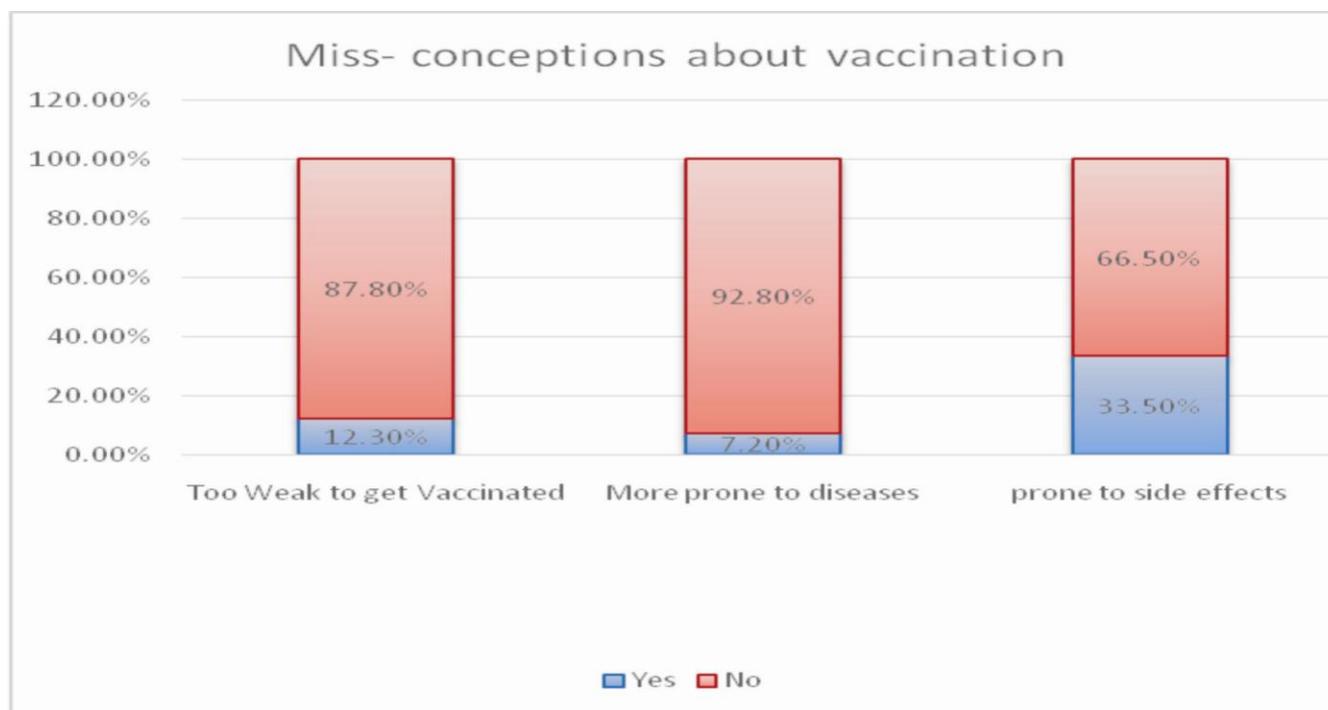


Fig. 2: Frequency distribution of Miss-Conceptions about vaccination.

the provision of basic health services to common people more difficult.^{1,2} Interestingly, results of our study supports that, although majority of the mothers interviewed had an education up to primary had complete vaccination of their children.³ This fact is supported in study which shows that maternal education especially the health literacy, is associated with greater insight about the improved health status of the children.⁴ Moreover, this helps in understanding of the fact that which health service is to be adopted at which appropriate time.⁴ Therefore, statistic also supports that, timely intervention helps improved child health which actually boast the motivation.^{7,8} Hence, it is need of today, that women empowerment can only be achieved with maternal education which intern plays a key role in safeguarding the health of their children.⁹

Many studies support that, besides maternal education, other factors like family income, and type of family system also play a role in making the immunization program a success.^{3,4} In our study, although majority of participants had family income less than 25,000 per month but they were living in joint family system. Literature supports that joint family system create a bonding among the household both emotionally and financially.³⁻⁵ Motivation among the family members increases especially among the females when elder head of the family, supports in obtaining any health facility.⁹ Moreover, information can be mutually shared among the households which benefit everyone.¹⁰⁻¹² This is due the fact that, in Pakistan females are living in male dominant society where they cannot take inde-

pendent decisions so joint family support helps to facilitate them in this regard.¹³

Interestingly, a significant association has been found between the full vaccination status of the last born child and the nearby primary health care facility which were providing the vaccination facilities. This has been documented that, primary health care center in Pakistan, beside many flaws, are an important source where the vaccines under the umbrella of Expanded Program of Immunization is providing free of cost services to children.^{1,13} Moreover, the results of the current study suggest that that the distance of the health facility is one of the motivating factor.³ The nearer the health facility from the place of residence, more effective will be the utilization rate.⁴ As mother will find the convenient time to get their children vaccinated and at the same time cost effectiveness of the services will remove the possible barriers in utilization.²

Over the past few decades, media had been playing a visible role to change the health behaviors among masses.¹⁴ If we look at past, television, newspapers, magazines and radio was playing this role very effectively and even today its providing passive information to masses.¹⁵ Nowadays, their role is partly played by the social media platform on mobile phones through internet.¹⁴ People are now connected with the world twenty-four hours. This media has been playing a very positive role in changing the health seeking behaviors of people.¹⁵ Any new preventive invention gets viral with in few seconds. The same is depicted by the res-

ults of our study the, full coverage of vaccination was found to significantly associated with the role of media. This is the reason that majority of the participants knew that Polio, Measles and TB were most preventable diseases if vaccination was done in time. Apart from this, the role of mobile teams in making the vaccination coverage a success cannot be overlooked. Beside the security issues the mobile teams are providing vaccine to people at their door steps.¹⁵

There are many barriers which can make the vaccination coverage a complete failure.¹⁶ The most identified barriers are lack of parental education, low socio-economic status, poor access to health facilities, inequalities in rural/urban residence and traditional beliefs.¹⁶ In current study the traditional beliefs like fear of side effects was the most encountered barrier. This can only be overcome by empowering our women with education which will help them making appropriate decision about the health of their children.

It is **concluded** that the full vaccination status of children is significantly associated with maternal education, family support, cost effective health facilities provided by primary health care centers near to place of residence. The media and mobile team are playing a vital role in making effective vaccination awareness among people.

Authors' Contribution

HA: Conceptualization of main concept of this project. Literature search. Data collection. Data compilation and analysis. Development of the discussion and conclusion. SS: Conceptualization of main concept of this project. Data collection. Development of the discussion and conclusion.

RUA: Literature search. Data collection. Data analysis.

The rest of those who have been included in the authors list helped in literature search, data collection and data entry.

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Conflict of Interest

No conflict of interest.

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REFERENCES

1. Epi .govt. The Expanded Program on Immunization (EPI), Pakistan pkhttp://epi.gov.pk/?page_id=1163#.
2. NIPS: Pakistan Demographic and Health Survey Islamabad: National Institute of Population Studies Islamabad, 2012-2013.
http://www.nips.org.pk/abstract_files/PDHS%20Final%20Report
3. Al-lela OQ, Bahari MB, Salih MR, Al-abbassi MG, Elkalimi RM, Jamshed SQ. Factors underlying inadequate parents' awareness regarding pediatrics immunization: findings of cross-sectional study in Mosul-Iraq. *BMC paediatrics*, 2014; 14 (1): 29.
4. Imran H, Raja D, Grassly NC, Wadood MZ, Safdar RM, O'Reilly KM. Routine immunization in Pakistan: comparison of multiple data sources and identification of factors associated with vaccination. *International health*, 2018; 10 (2): 84-91.
5. Childhood immunization in Pakistan. Available online at; http://resdev.org/files/policy_brief/3/3.pdf.
6. Owais A, Tikmani SS, Sultana S, Zaman U, Ahmed I, Allana. Incidence of pneumonia, bacteremia, and invasive pneumococcal disease in Pakistani children. *Trop Med Int Health*, 2010; 15: 1029-3.
7. Pakistan second endemic country to introduce IPV into routine immunization schedule. Available online at; <http://www.emro.who.int/pak/pakistan-infocus/introduces-ipv-in-routine-immunization.html>
8. Rotavirus Vaccine introduced in Punjab EPI Schedule. Available online at; <https://www.punjab.gov.pk/node/2199>.
9. Subhani S, Yaseen R, Khan MA, Jeelani G, Fatima R. Impact of mother's education on child immunization: a comparative study of India and Pakistan. *Journal of Finance and Economics*, 2015; 3 (3): 51-4.
10. Johri M, Subramanian SV, Sylvestre MP, Dudeja S, Chandra D, Koné GK, Sharma JK, Pahwa S. Association between maternal health literacy and child vaccination in India: a cross-sectional study. *J Epidemiol Community Health*, 2015; 69 (9): 849-57.
11. Greenaway ES, Leon J, Baker DP. Understanding the association between maternal education and use of health services in Ghana: Exploring the role of health knowledge. *Journal of Biosocial Science*, 2012; 44 (6): 733-47.
12. Masadeh MM, Alzoubi KH, Al-Azzam SI, Al-Agedi HS, Abu Rashid BE, Mukattash TL. Public awareness regarding children vaccination in Jordan. *Human Vaccines & Immunotherapeutic*, 2014; 10 (6): 1762-6.
13. Mics, Balochistan multiple indicator cluster survey, Health, Editor. 2011, Planning and Development (P&D) Department Government of Baluchistan in collaboration with UNICEF (United Nations Children's Fund).
14. Wakefield MA, Loken B, Hornik RC. Use of mass media campaigns to change health behaviour. *The Lancet.*, 2010; 376 (9748): 1261-71.
15. Abroms LC, Maibach EW. The effectiveness of mass communication to change public behavior. *Annu Rev Public Health*, 2008; 29: 219-34.
16. Topuridze M, Butsashvili M, Kamkamidze G, Kajaia M, Morse D, McNutt LA. Barriers to hepatitis B vaccine coverage among healthcare workers in the Republic of Georgia: An international perspective. *Infection Control & Hospital Epidemiology*, 2010; 31 (2): 158-64.
17. Restrepo-Méndez MC, Barros AJ, Wong KL, Johnson HL, Pariyo G, França GV, Wehrmeister FC, Victora CG. Inequalities in full immunization coverage: trends in low- and middle-income countries. *Bulletin of the World Health Organization*, 2016; 94 (11).