

PATTERN AND BURDEN OF VARIOUS MYTHS REGARDING POLIO VACCINE AMONG THE PARENTS OR LEGAL GUARDIANS WHO REFUSED POLIO VACCINATION TO THEIR CHILD

TUFAIL N*, JAMIL MF, IJAZ B, USMAN A, SHAHEEN A, NAQVI SAA

Department of Community Medicine, Nishtar Medical University, Multan, Pakistan

*Correspondence author email address: drnida123@yahoo.com

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Abstract: Polio is still prevalent worldwide and is yet to be eradicated from Pakistan despite the best efforts of various national and international organizations such as WHO, UNICEF, and UNESCO. A study was conducted to determine the different myths surrounding polio vaccination among parents or legal guardians who refused to vaccinate their children. The study aimed to identify the pattern and burden of various myths regarding the polio vaccine among the parents or legal guardians who refused polio vaccination to their children. This descriptive cross-sectional study was conducted at the Department of Community Medicine, Nishtar Medical University, Multan, in major areas of Multan City from June 25, 2022, to June 24, 2023. Field visits were made to the homes of parents or legal guardians of households who refused polio vaccination on the last 2 consecutive campaigns by EPI. Of the 241 respondents, 154 (63.9%) were males, and 87 (36.1%) were female respondents. The mean age of the study cases was 31.12 ± 4.59 years. The mean number of children was 4.12 ± 1.02 , ranging from a minimum of 2 to a maximum of 7. Most of the study participants were illiterate, with only 12 % having education up to the matriculation level, and none having educational level more than matriculation. Of the 241 study cases, 87 (36.1 %) were jobless, 32% were laborers, 12.4% were shopkeepers, 3.7 % had their own business, 11.6 % were farmers, and 4.1 % had private jobs. Of the 241 study participants, 4.1% were Urdu speaking, 23.7% were Punjabi, 44 % were Saraiki, 15.8% were Baloch, and 12.4% were Pathans. The study results showed that 16.6% of the participants reported that the vaccine was unnecessary, and 52.3% reported that the vaccine was harmful. Most parents or guardians who refused to vaccinate their children against the polio virus believed that the vaccine was harmful and unnecessary. The myth that the vaccine is harmful and will make their child sterile was more prevalent. In contrast, the myth that the vaccine is unnecessary was significantly associated with the gender of respondents, education, socioeconomic status, occupation, and ethnicity. On the other hand, the myth that the vaccine is harmful was significantly associated with increasing age, socioeconomic status, education, occupation, and ethnicity.

Keywords: Polio, Vaccination, Myths, Harmful, Unnecessary

Introduction

In 1988, the World Health Assembly resolved to achieve the global eradication of poliomyelitis by 2000 (Dowdle and Cochi, 2002). While significant strides were made towards this goal, as of 2010, poliovirus types 1 and 3 were circulating in four countries where poliomyelitis is endemic (Control and Prevention, 2001; Dept and Center for Global Health, 2013). Additionally, sporadic cases led to widespread outbreaks in over 20 countries in 2009 and 2010 (Grard et al., 2010; World Health Organization Country Office Tajikistan and WHO Regional Office for Europe, 2010).

The opinion on vaccines varies widely, and many people consider vaccines one of the most significant achievements in modern medicine, while others hold opposing views (Organization, 2010). Vaccine opponents, often called anti-vaxxers, provide several reasons to support their claims that vaccines are perilous and, as a result, should not be administered (Hopkins, 2013).

The fear that vaccines can lead to autism originated from a study by Dr. Andrew Wakefield, a British surgeon and medical researcher. In 1998, *The Lancet*, a renowned and esteemed medical journal with a long history, published Dr. Wakefield's study, which suggested a potential connection between the MMR (measles, mumps, and rubella) vaccine and autism (Mesquita et al., 2020). However, *The Lancet*

promptly and completely retracted this 1998 publication based on the General Medical Council (GMC) findings, which revealed that certain aspects of the research had been falsified (Caplan, 2009). This study's consequences have reverberated throughout medical and non-medical communities worldwide, ultimately harming the well-being of children and families everywhere. Dr. Wakefield's questionable "research" has severely impeded progress in vaccine-preventable diseases, setting it back by many years, and many parents panicked and refused to vaccinate their children against measles (Bonnieve et al., 2021).

The number of polio cases has significantly decreased, dropping from an estimated 350,000 cases in 1988 to just 223 cases worldwide in 2012. This remarkable achievement can be attributed to the success of a global polio eradication program driven by the utilization of the polio vaccine. By 2012, only three countries still had endemic polio cases: Afghanistan, Nigeria, and Pakistan (Bonnieve et al., 2021). In Pakistan, resistance to vaccination is most prevalent among low-income individuals of Pashtun ethnicity. Qualitative interviews conducted by Khowaja et al. (Khowaja et al., 2012) shed light on the reasons for this refusal. Many parents expressed concerns that the oral polio vaccine (OPV) could lead to sterility in adulthood. Some suspected that the vaccine, developed and distributed by Westerners, was part of a larger conspiracy to sterilize

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children in Muslim nations (Michael et al., 2014). Additionally, dissenting parents raised apprehensions that these vaccines may contain religiously forbidden or Haram ingredients (Michael et al., 2014). Michael et al. (Michael et al., 2014) discovered that 61% of children were left unvaccinated due to subpar performance by vaccination teams. Specifically, this poor performance encompassed two primary issues: either the vaccination teams failed to visit these children's homes (25%), or the children were marked absent and not revisited (36%). Additionally, in a quarter of the cases (25%), parental refusal was the primary reason for the child not receiving the vaccine. Khawaja AR and his associates have reported in another study that myths and causes of vaccine refusals were the vaccine is unnecessary 6%, the vaccine is harmful 50%, and a parent or legal guardian did not allow vaccination 34.5% (Bonnieve et al., 2021).

Very few studies evaluating the results of polio vaccine refusals in our general population have been published. Our area has large cultural and ethnic diversity, so I have decided to determine the frequency of myths and causes of polio vaccine refusal by parents or legal guardians in our general population. My study will pave the way for our medical community and policymakers to develop a proper program to address the reasons for polio vaccine refusals through proper counseling of our general population.

Methodology

This descriptive cross-sectional study was conducted at the Department of Community Medicine, Nishtar Medical University, Multan, in Major areas of Multan City from 25-06 – 2022 to 24 – 06 – 2023. The sample size was 241, calculated using the CDC's Epiinfo software, Where expected least proportion (Vaccine is unnecessary among parents who refused polio vaccine) $p = 6\%$. $11q = 1 - p$ and $d = 3\%$ and Confidence level = 95%. Parents (either mother or father) or legal guardians aged 20-40 years whose children (aged < 5 years) were not vaccinated even visited by the polio team who did not participate in the two most recent polio SIAs (supplementary immunization activities). Those who refused consent, the absence of the head of the family after 3 consecutive visits, and the family's relocation outside the specified area were excluded from our study.

The sampling frame for the study included names of parents or legal guardians of households that appeared on the list of noncompliance for the last two rounds of polio SIAs (supplementary immunization activities) in the local health department. Field visits were conducted to the homes of parents or legal guardians of households who refused polio vaccination on the last 2 consecutive campaigns by EPI. Informed consent was taken from each parent or legal guardian. Number of children <5 years old were noted. Data was collected for the myths, defined as the vaccine is unnecessary and harmful. The vaccine is unnecessary: It was defined as a parent or legal guardian saying there is no benefit to the polio vaccine. The vaccine is harmful: It was defined as if the parent or legal guardian says the polio vaccine causes sterility in adulthood.

Data was analyzed with a statistical analysis program (SPSS version 25). Frequency and percentage were computed for qualitative variables like the gender of parents or guardians, education level, the vaccine is unnecessary, the vaccine is

harmful, socioeconomic status, occupation of the family head, and ethnicity. Mean±SD was presented for quantitative variables like the age of parents or guardians and number of children. Effect modifiers like age, gender, number of children, socioeconomic status, and occupation of the family head, ethnicity, and education level were controlled by applying a chi-square test at 95 % CI.

Results

Of these 241 study cases, 154 (63.9%) were males and 87 (36.1%) were female respondents. The mean age of our study cases was 31.12 ± 4.59 years (range: 24 years to 40 years). The mean age of the male respondents was 33.10 ± 4.27 years, while that of female respondents was 27.60 ± 2.58 years. ($p = 0.000$) and 125 (51.9%) were aged 31 – 40. The mean no. of children was 4.12 ± 1.02 (with a minimum no. of children was 2 while the maximum no. of children was 7. (Table 1).

Most of our study participants were illiterate, i.e., 212 (88%), only 12 % had education up to matriculation level, and none had an educational level more than matriculation (Table 2).

193 (80.1%) had poor socioeconomic status and 48 (19.9%) were from the middle class. Of these 241 study cases, 87 (36.1 %) were jobless, 32% were laborers, 12.4% were shopkeepers, 3.7 % had their own business, 11.6 % were farmers and 4.1 % had private jobs (Figure 1).

Table 1: Demographics of Study Cases

Characteristic	Total Count	Percentage
Total Study Cases	241	100%
Male Respondents	154	63.9%
Female Respondents	87	36.1%
Mean age (years)	31.12	-
Age Range (years)	24 - 40	-
Mean Age (Male Respondents)	33.10	-
Mean Age (Female Respondents)	27.60	-
Age 31 - 40 years	125	51.9%
Mean Number of Children	4.12	-
Min Number of Children	2	-
Max Number of Children	7	-

Table 2: Education and Socioeconomic Status

Education Level	Count	Percentage
Illiterate	212	88%
Up to Matriculation	29	12%
Above Matriculation	0	0%

Table 3: Language and Attitudes towards Vaccine

Language	Count	Percentage
Urdu Speaking	10	4.1%
Punjabi	57	23.7%
Saraiki	106	44%
Baloch	38	15.8%
Pathans	30	12.4%

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Of these 241 study participants, 4.1% were Urdu speaking, 23.7% were Punjabi, 44 % were Saraiki, 15.8% were Baloch and 12.4% were Pathans (Table 3).

Forty (16.6%) of our study participants reported that the vaccine was unnecessary, and 126 (52.3%) reported that the vaccine was harmful (Figure 2).

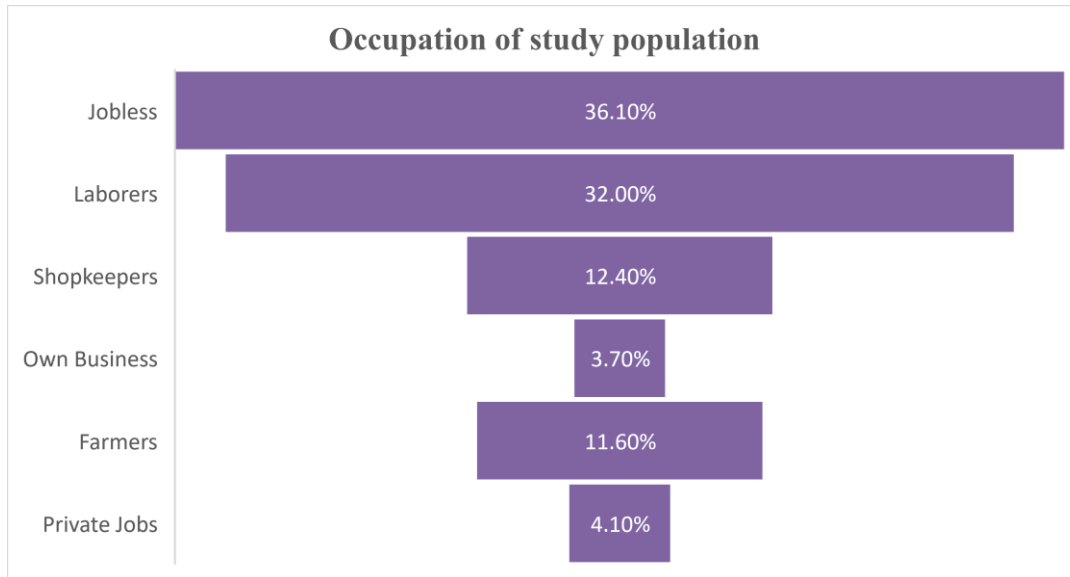


Figure 1: Occupation of Study Cases

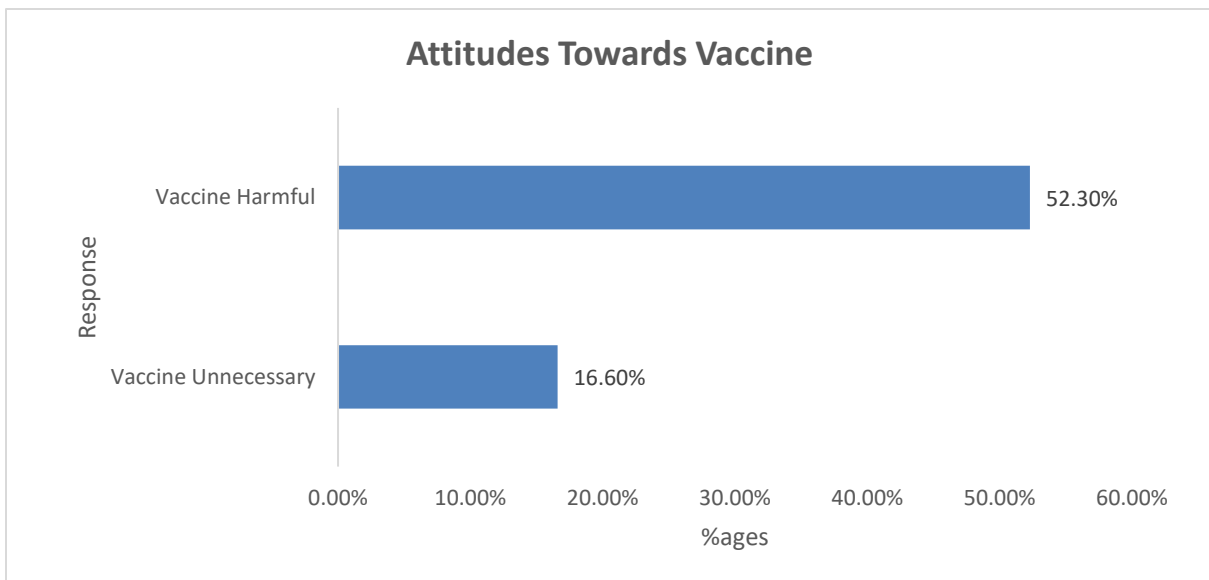


Figure 2: Attitudes towards Vaccine

Discussion

Pakistan stands as one of just three countries globally that continue to grapple with the challenge of interrupting poliovirus transmission in the 21st century. In the year 2019 alone, the country reported a total of 146 cases of polio, with some of these cases tragically resulting in fatalities (Ahmad et al., 2020; Saleem et al., 2023). While official records have indicated high vaccine coverage, exceeding 90%, during polio Supplementary Immunization Activities (SIAs) in Pakistan, the actual coverage remains doubtful. A report issued by the Independent Monitoring Board of the Global Polio Eradication Initiative underscored significant shortcomings in the planning and execution of polio SIAs

within Pakistan. Numerous factors have contributed to the elusive nature of the goal to eliminate polio in Pakistan. These factors encompass inconsistent quality in SIAs, the failure to reach immunization targets in various regions, challenges in accessing children due to ongoing military conflicts, extensive floods, subpar routine immunization services, a structurally weak polio eradication program, the presence of sizable nomadic and internally-displaced populations, and resistance from some parents who refuse to have their children vaccinated (Khan et al., 2015). These factors have often led to the concentration of unvaccinated children in specific areas, putting them at a heightened risk of contracting polio (Michael et al., 2014).

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Of these 241 study cases, 154 (63.9%) were males and 87 (36.1%) were female respondents. A similar kind of study done by Khan et al. (Khan et al., 2015) to assess the perceptions of parents regarding polio vaccination also revealed high male gender predominance with 62 %, close to our study results.

The mean age of our study cases was 31.12 ± 4.59 years (range: 24 years to 40 years). The mean age of the male respondents was 33.10 ± 4.27 years, while that of female respondents was 27.60 ± 2.58 years. ($p = 0.000$) while 125 (51.9%) were aged 31 – 40 years of age. Khan et al. (Khan et al., 2015) reported similar results.

Most of our study participants were illiterate, i.e., 212 (88%), only 12 % had education up to the matriculation level, and none had educational level more than matriculation. 193 (80.1%) had poor socioeconomic status and 48 (19.9%) were from the middle class. Of these 241 study cases, 87 (36.1 %) were jobless, 32% were laborers, 12.4% were shopkeepers, 3.7 % had their own business, 11.6 % were farmers and 4.1 % had private jobs. Our study's findings are consistent with the findings of Khan et al. 16 and Khowaja et al. (Khowaja et al., 2012). Khan et al. also reported high illiteracy among parents in two areas where polio was quite common and further demonstrated that most of these parents had low income. Almost 33 % of unemployment was reported by Khan et al. 16. These reports are similar to our study results. Khowaja et al. (Khowaja et al., 2012) also reported that most parents who refused to vaccinate their children against polio were low-income Pashtuns.

Of these 241 study participants, 4.1% were Urdu speaking, 23.7% were Punjabi, 44 % were Saraiki, 15.8% were Baloch, and 12.4% were Pathans. Our results differ from those of Khowaja et al. (Khowaja et al., 2012) and Khan et al. (Khan et al., 2015) because of the ethnic diversity in this region. Khowaja et al. (Khowaja et al., 2012) conducted their study in Karachi, while Khan et al. (Khan et al., 2015) conducted their study in Peshawar and Quetta, which have different ethnic and socio-demographic distributions compared with our southern Punjab region.

Forty (16.6%) of our study participants reported that the vaccine was unnecessary, and 126 (52.3%) reported that the vaccine was harmful. Khowaja et al. From Karachi reported that 6 % of parents believed the vaccine was unnecessary, while 50 % reported the vaccine was harmful, and the majority of them were Pashtoons. Similarly, in our study, all 30 Pashtoons who refused to vaccinate their children believed the vaccine was harmful. ($p = 0.00$).

Conclusion

Our study results have indicated that most parents/guardians who refused to vaccinate their children against polio virus reported that the vaccine was harmful and unnecessary. The myth that "vaccine is harmful and will make our child sterile" was more prevalent. The myth that the vaccine is unnecessary was significantly associated with the gender of respondents, education, socioeconomic status, occupation, and ethnicity. In contrast, the myth that the vaccine is harmful was significantly associated with increasing age, socioeconomic status, education, occupation, and ethnicity. An awareness campaign led by local religious, ethnic, and political representative can help improve

their knowledge to improve vaccination coverage. This will help eradicate this menace from our society and provide relief to our national health economy.

Declarations

Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned.

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared absence of conflict of interest.

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