



Vaccine Resistance-Vantage Point from Health Professionals of South India

Kanniyan Binub^{1*}, Govindaraj² and Sheela P. Haveri³

¹Department of Community Medicine, Annamalai University, Chidambaram, Tamil Nadu, India.

²Department of Community Medicine, Raja Muthiah Medical College, Chidambaram, Tamil Nadu, India.

³Department of Community Medicine, MES Medical College, Kerala, India.

Authors' contributions

This work was carried out in collaboration among all authors. Author KB designed the study, wrote the protocol and the first draft of the manuscript. Authors Govindaraj and SPH managed the analyses and literature searches of the study. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JPRI/2021/v33i1131244

Editor(s):

(1) Dr. Syed A. A. Rizvi, Nova Southeastern University, USA.

(2) Dr. Sawadogo Wantinga Richard, Ministry of higher education, scientific research and innovation, Burkina Faso.

(3) Prof. Ali Nokhodchi, University of Sussex, UK.

Reviewers:

(1) Eyoel B. Mekonen, St. Paul's Hospital Millennium Medical College, Ethiopia.

(2) Seydi Yıkımsı, Tekirdag Namik Kemal University, Turkey.

(3) Ramin Farhoudi, Pasteur institute of Iran, Iran.

(4) Sevgi Kalkanli Tas, University of Health Sciences, Turkey.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/65745>

Original Research Article

Received 28 December 2020

Accepted 02 March 2021

Published 15 March 2021

ABSTRACT

Background: Vaccination is the most effective method of preventing infectious diseases. Early success brought widespread acceptance and mass vaccination campaigns have greatly reduced the incidence of many diseases in numerous geographic regions.

Objectives: To study the perspective of health professionals regard to barriers and solution for vaccination program in a district of South Kerala.

Materials and Methods: A qualitative study design was done using free listing technique for both barriers and solutions. The data was entered into notepad and was transferred to Visual Anthropac software trial version. The software helped to generate ten important free lists of barriers and solutions with percentage, rank and Smith S value.

Results: The present study had discussed regarding trust of western countries promoting

*Corresponding author: E-mail: kanniyanbinub@gmail.com;

vaccination and conspiracy theories related to them. The work of antivaccine lobby globally was debated. The controversy of MMR Autism and political will of different countries were deliberated. The role of media especially impact social media and internet had paved pathway for swift spread of contents.

Conclusion: Major interventions should be planned systematically by the government to address barriers for immunization. Strengthening Information education and communication (IEC) over digital media using appropriate technology should be engrossed for sustaining vaccine coverage.

Keywords: Resistance; barriers; vaccines.

1. INTRODUCTION

Vaccination is a highly effective method of preventing certain infectious diseases. Vaccines are usually safe and rarely lead to untoward incidents. Globally routine immunization programs are very important as they help to prevent killer diseases which were nightmares. Vaccination is the utmost public health tool which guarantees prevention to an extent. Evolving from Chinese inoculation followed by Edward Jenner's observation, immunization had helped to prevent many outbreaks. The germ theory and invention of microscope had paved path for understanding the concept of natural history of disease pertaining to communicable disease in simple terms. Advanced research helped to explore possibility of developing immunity for specific diseases [1].

In the current scenario lot of discussions are revolved around successful completion of COVID 19 vaccine trial worldwide. A study conducted attempted in surveying subjects from 19 countries to determine acceptance and denial for COVID-19 vaccine [2]. Among them 71.5% of participants were in favor to take the shots of COVID-19 vaccine and 61.4% reported that they will be willing based on employer's recommendation to proceed. The acceptance to take vaccines varied from countries documented as 90% (in China) to less than 55% (in Russia). The community who believed in government policies came forward to accept the shots without hesitancy.

The drastic growth in science and technology had enabled to bring competent vaccines into the market. Unfortunately, vested interest of antivaccine group had fueled the scenario with myth and maladies. History had witnessed decrement in infectious disease incidence and had shown the decline of graph with advent of intervention after vaccination programs. Routine immunization initiated by global governments across had played pivotal role in sustaining herd

immunity. In recent years vocal minority in the developed and developing world has questioned the safety and net benefits of vaccines. Vaccines are special among medical interventions which are given to healthy individuals for prevention of diseases that is safe for the population. Many vaccine-preventable diseases are now so infrequent. Only context in which many individuals have heard of these diseases is hypothetical adverse effects presented by the media in dramatic way.

WHO had framed "The Immunization Agenda 2030" focusing on pertained vision and strategy for vaccines and immunization for the decade 2021–2030. It draws on the lessons learned from the past, stress on new challenges posed by infectious diseases, and aims to rejuvenate on new opportunities to meet existing challenges. IA2030 is hope for the future which can bring magnificent changes productively with cost effectiveness. It would help to achieve more milestones with professional planning and strategy [3]. Health workers should approach client with necessary knowledge and focus on necessary behavioral change communications. Vaccination programs are not for individual, but for the community with safety nets [4].

The vaccination coverage is crucial to prevent disease in the population. Sustainability of program is fundamental duty of all stakeholders involved. The present study is done based on the social commitment to enlist barriers for the program and put forth solutions which can help in breaking those barriers.

2. MATERIALS AND METHODS

It was a descriptive quality design carried out with application of free listing technique. The present formative research was undertaken in the district of Malappuram in the state of Kerala, South India. The literacy level of the district is 98.4% for women and 98.3% for men. But this district is the most populous among other

districts of Kerala. Total unmet need for pregnancy is 17.4%. According to NFHS Survey only 43.1% of eligible couples are only practicing any one method of contraception. Only 16.8% of the mothers had taken assistance from Janani Suraksha Yojana program. The rest of women depend on private hospitals for delivery services [5].

The technique used was free listing for studying barriers and solutions to vaccination program involving ten subjects. The samples were selected based on purposive sampling. The study participants were various stakeholders involved in care giving. The study subjects in which data was collected from Associate professor of Community Medicine from Government medical College in the district, Pediatricians from both private and government sector, Doctor from voluntary organization, Medical Officers from Government Primary health center and district hospital, Health inspectors and ASHA workers. Each viewpoint from different stakeholder gave different insights to the topic.

The data was collected by the principal author who is trained in qualitative methods. The duration of the study was one and half years (June 2019 to December 2020) Each stakeholder was met on separate days according to their convenient date and timing. Time spent at each stakeholder was 20 to 30 minutes. After obtaining written consent free listing exercises were used to get reasons for barriers to immunization and their solution to it. In the free list exercises caregivers were asked to make an individual free list of the various reasons for barriers to immunization and the solution for it. Smith S (Smiths saliency score) refers to the importance, representativeness or prominence of items to individuals or to the group. The data was entered into notepad and was transferred to Visual Anthropac software trial version for data analysis. The software helped to generate ten important free lists with percentage, rank and Smith S value. The data was interpreted by categorizing under different headings and by engendering themes for both barriers and solutions to vaccination.

3. RESULTS

The different barriers identified was enlisted and the factor topped with highest Smith S value was Distrust of western countries with 0.267. The rest

of the barriers then were placed in descending order on the basis of Smith S value. The frequency which depends on number of subjects stressed on the same variable was 30.0 for the first enlisted barrier, i.e. distrust to the western countries and the rank was 1.67. Followed by Negative media with frequency 40.0, rank 3.25 and Smith S value 0.266. The frequency for concern for side-effect was 40.0 with rank 3.00 and Smith S value 0.240. Smith S value for Negative propaganda by antivaccine lobby was 0.200 with frequency 20.0 and rank 1.00. Some Previous Bitter experience with frequency of 30.0, rank 3.33 and Smith S value 0.196. Followed by Ineffective vaccine logistic management with Smith S value 0.183, frequency 30.0 and rank 4.67. Chemophobia ranked 3.50 with frequency 20.0 and salient factor 0.151. There were some comments from parents which was quoted by caregiver subjects that the present generation have no diseases contracted even though vaccination not taken. This statement was repeated and had frequency of 30.0 with rank 4.33 and S value 0.145. Frequency was 30.0 for a similar comment Even after immunization diseases are coming with rank 3.67 and Smith value 0.140. Lack of Political will was having S value 0.110 with frequency 20.0 and rank 5.50.

The solutions enumerated were Intensify IEC activities with highest Smith S value 0.266, frequency 50.0 and rank 3.60. There was suggestion to make a documentary which was ranked 2.50 with frequency 20.0 and S value 0.150. Awareness programs at religious schools were presented with frequency 20.0, rank 3.50 and S value of 0.117. The comment Immunization should never be given coercively was repeated with frequency of 20.0, rank of 3.50 and S value of 0.117. Strengthening vaccine management had frequency of 10.0, rank 1.00 and saliency value of 0.100. Relatives of hesitant parents should communicate with them had frequency of 10.0, rank of 1.00 and S value of 0.100. Health education for school children was ranked 1.00 with S value 0.100 and frequency of 10.0. Followed by statement To bring awareness that science and medicine are neutral towards humanity which had frequency 10.0, rank 1.00 and S value 0.100. Inclusive approach engaging alternative system had frequency of 10.0, rank 1.00 and S value 0.100. Health education need of immunization should be taught to parents at time of pregnancy itself by frequency 10.0, rank 1.00 and Smith S value 0.100.

Table 1. Smith S value of barrier regarding to immunization listed by caregivers

Item	Frequency (%)	Average rank	Salience
Distrust of the western countries	30.0	1.67	0.267
Negative media	40.0	3.25	0.266
Side effect concern	40.0	3.00	0.240
Negative propaganda by antivaccine lobby	20.0	1.00	0.200
Previous Bitter experience	30.0	3.33	0.196
Ineffective vaccine logistic management	30.0	4.67	0.183
Chemophobia	20.0	3.50	0.151
The present parent generation have not contracted any disease even though vaccination not taken	30.0	4.33	0.145
Even after immunization diseases are coming	30.0	3.67	0.140
Lack of Political will	20.0	5.50	0.110

Table 2. Smith S value of solutions regarding to immunization listed by caregivers

Item	Frequency (%)	Average rank	Salience
Intensify IEC activities	50.0	3.60	0.266
Should make a documentary	20.0	2.50	0.150
Awareness programs at religious schools	20.0	3.50	0.117
Immunization should never be given coercively	20.0	3.50	0.117
Strengthening vaccine management	10.0	1.00	0.100
Relatives of hesitant parents should communicate with them	10.0	1.00	0.100
Health education for school children	10.0	1.00	0.100
To bring awareness that science and medicine are neutral towards humanity	10.0	1.00	0.100
Inclusive approach engaging alternative system	10.0	1.00	0.100
Health education need of immunization should be taught to parents at time of pregnancy itself	10.0	1.00	0.100

3.1 Inputs

3.1.1 Negative propaganda

Alternative systems especially homeopathy doctors have always been in the forefront to speak against vaccination. As modern medicine doctors claim homeopathy as pseudoscience, the latter takes vaccination as an opportunity to target modern medicine through vaccination. There was instance when leader of a government doctors organization came openly against pulse polio immunization when the association observed strike. The anti-vaccine lobby are small in proportion but social media hastened negative propaganda. Media took special interest in highlighting adverse events and geared platform for anti-vaccine columnist.

3.1.2 Ignorance

People tend to be ignorant on facts for multifactorial reasons. Chemophobia is the new trend which is observed as prevalent nowadays. The community is scared of chemicals or ingredients present in the vaccine. Myth on Infertility burnt issue at Malabar when it was entangled with religion which had synergistic effects leading to hesitancy. The society is confused with misinterpretations on religious grounds, but the complex part is no religious scholars nor religious associations of the area are against vaccines. West Phobia is genetic nor described as born in blood. Historically colonial rule of British had influenced people to develop negative attitude. Fathers are the decision makers of this region and they are even prone to

divorce the spouse if child is vaccinated without paternal consent.

Lack of awareness of local politicians regarding importance of vaccination is a major concern. The opinion makers are easily driven by the local antivaccine lobby. The community is unaware of information about benefits of vaccines and there is no perceived threat for it. Parents are not completely aware of the necessity and prevention capacity of vaccines. Failure to differentiate quacks and alternative system professionals are another issue. False claim regarding prefix of doctor tag to quacks by self is challenge to which people are pulled in wrong direction. The caring nature of mother limits her to see pricking own child.

3.1.3 Health system issues

There are issues related to accessibility of vaccination sites, as many government health facilities are located interior. Ineffective Logistic Management is another concern to be addressed. There are instances when vaccine is out of stock. In populous and backward district there are inadequate manpower ratio. Inadequate time spend by pediatricians for health education and consultation is one of the limitations why parents are not attracted to vaccination. There are still more room for training of healthcare caregivers. Inadequate knowledge of doctors regarding immunization is to be taken seriously. Ineffective Communications are the major setback faced by the clinicians in comparison to quacks. Non-inclusion of Private Sector in mainstream immunization with government supply is to be thought off eventually.

3.1.4 Social system

Grandparents are the decision makers for immunization to the child, in this part of the country. There is unmet need for mothers to be solved regarding the same issue. Gender neglect along with lack of freedom for decision making is still a social issue in Malabar for women. Along with all these sociocultural factors lack of adequate political will need to be addressed.

4. DISCUSSION

Resistance to vaccination is a phenomenon which can be witnessed in different parts of the world. Recent advances in telecommunication especially social media is playing pivotal role for negative propaganda [6]. There are so many

similar patterns of resistance and negative propaganda around the globe. In a study done in west Bengal, Vaccine hesitancy was present among parents and relatives of children was 103 (29%) [7]. In the present study, the most common barrier free listed with highest Smith S value was found as distrust to western countries. People in Malabar have strong feeling that there is some conspiracy done by western countries for depopulating them. Even some movements inspired through social and mainstream media had generated conspiracy beliefs which had been barrier to implementation of government and international initiatives, especially public health programs. And there are popular theories put forth by social scientist in regard to this and one theory among them is 'Exit' and 'Voice' as a Framework conceptualized by Hirschman [8]. He suggested citizens can exercise 'voice' by participating in or protesting government's policies, or exercise 'exit' by voting for an alternative party.

Feeling of alienation, powerlessness, hostility, and being disadvantaged is the feeling to conspiracy was the findings in a study [9]. In another study stated that conspiracy theories are attracted to subjects who have adapted subjugation and domination [10]. Several studies investigated the potential impact of anti-vaccine conspiracy beliefs, and its relation to anti-vaccine conspiracy theories on vaccination intentions. Study conducted in UK a group showered light on significant negative relationship between anti-vaccine conspiracy beliefs and vaccination intentions. This effect was mediated by the perceived dangers of vaccines, and feelings of powerlessness, disillusionment and mistrust in authorities. Another group of subjects were exposed to information that either supported or refuted anti-vaccine conspiracy theories, or a control condition and came with outcome that participants who had been exposed to material supporting anti-vaccine conspiracy theories showed less intention to vaccinate than those in the anti-conspiracy condition or controls. This effect was mediated by the same variables as in first study group. These findings point to the potentially detrimental consequences of anti-vaccine conspiracy theories, and highlight their potential role in shaping health-related behaviors [11].

In another study done in 5,323 participants of 24 countries, it pointed that psychological factors might motivate people to reject scientific consensus around vaccination. The results found

were in order of magnitude were antivaccination attitudes were highest among those who were high in conspiratorial thinking, who were high in reactance, reported high levels of disgust toward blood and needles, and had strong individualistic/hierarchical worldviews. In contrast, demographic variables (including education) accounted for nonsignificant or trivial levels of variance. And the study concluded that the data helped to identify the “attitude roots” that may motivate and sustain vaccine skepticism. In so doing, they help shed light on why repetition of evidence can be nonproductive, and suggest communication solutions to that problem [8].

Anti-vaccination lobby though a very small number but robust and adamant have their own world of utopia portraying their own mythology revolving around ideas of purity and bodily integrity; distrust of science, industry, government, media and compelling accounts of childhood injury that parents blame on vaccines [10]. Vaccine hesitant groups on social media have an alarming footprint, with studies from the early 2000s to the present showing that large proportions of the content about vaccines on popular social media sites are anti-vaccination messages [11].

For decades these movements were ignored, but as technology advanced connecting people with mobile phones at each household, all those fairy tales and myths were propagated like forest fire. These lobby generate unnecessary fear by false claims that there is no much benefit even though vaccinated. The present study pointed one subjects' statement *“My parents nor our generation haven't taken vaccines, still we didn't contract any disease”*. There is no perceived threat found for some parents. They claim vaccines contain harmful ingredients. Some even claim that vaccines have been intentionally mixed with agents that cause cancer or infertility.

One of the famous incidents in history earmarked during year 1998, a British doctor Andrew Wakefield published a case series in the Lancet, which suggested that the measles, mumps and rubella (MMR) vaccine might lead children to developmental Disorders. After that study, several epidemiological studies refuted the posited link between MMR vaccination and autism. In 2010, the Lancet completely revoked that paper, while Wakefield et al. were held guilty of ethical violations and scientific misrepresentation and Wakefield's professional license in England was cancelled [12,13]. And

the investigation lead by media professional Brian Deer highlighted article of fraud and was recognized as one of the most serious misleading theory in medical history . Though of all evidence, anti-vaccination lobby on the social media expanded, especially due to incorporation of celebrities coming against vaccination [14].

A study was done aimed to elaborate the significant role of social networks and the Internet on vaccine hesitancy which indirectly shows attitudes and behaviors towards vaccination program, which was done on 6500 to 10,000 French mothers. And the results were social media influenced altered decision-making process and disrupted the warmth of doctor/patient relationship. The Internet exaggerated even minor controversial issues related to vaccination and altered public opinion, but it may also provide new tools to fight against vaccine hesitancy. The study concluded Vaccine hesitancy should be fought on the Internet battlefield and built new networks around the globe to fight the same. [15] Nowadays screen time had increased and children are addicted to media from younger ages. Another study depicts images in the media are a “powerful mechanisms for communicating ideas”. [16] Images will invoke reactions in people consistently when presented, which is the reason they have been used in many psychological studies. The New England Journal of Medicine reports that media images can strongly influence the public's beliefs concerning medicine and illness [17].

Political will, interest and policy decisions influence lay people regarding acceptance and denial of vaccines. The findings suggest that most parents including the vaccinating majority are susceptible to vaccine messaging from political and medical leaders [18].

The present study had found political will of any region is of prime importance. Boris Johnson in the year of 2019 had tried to frame a network to release accurate source for disseminating evidence-based information regarding vaccines. Whereas former US President Donald trump was confused regarding the authenticity of vaccination and had opined negatively against it in the public domain [19]. There were reports that the former president of United states had also took lead to reinvestigate case of Andrew Wakefield [20].

The present study highlighted importance of strengthening IEC activities. Newer technology

should be availed to be more productive. Digital tools, technology for needle-free vaccine administration, and more efficient supply chains management to empower immunization programs are to be on priority. Precise data analytics will help to improve performance, reach, and efficiency. The document by WHO SAGE recommends people focused policy tailoring to need and ensuring adequate response. The delivery of immunization services should be altered to the requirements of individuals and communities. Specific focus on addressing barriers in accessing immunization services based on sociodemographic and other relevant variables are put forth by the WHO. Country owned decentralization driving need to be established incorporated with accountability. Immunization stakeholders should coordinate actions to increase efficiencies and reach out to sectors beyond immunization for mutual benefit. Data guided evidence-based decision with tracking process should be envisioned [21]. Social mobilization should be advocated to incorporate opinion leaders for positive campaigns for immunization. Study found that use of local cable TV channels to promote "Immunization Religious leaders' involvement can help to enhance community participation [22]. The same strategy could be adopted in Malabar as people trust religious leaders and would adhere to their words.

5. CONCLUSION AND RECOMMENDATIONS

The present study completes with barriers identified foremost which highlights negative attitude of Malabar people to western countries. They are carried away by rumors and myths spread by global antivaccine lobby. The study concludes the hastening of this spread is through social media which need to be regulated or put in control with some feasible mechanism. And pro vaccine government machineries and international organizations like WHO should take lead in constructive IEC to reach the grassroot level. The highlighting solutions to break the resistance through activities to information could be by creation of useful documentary, conducting awareness programs at religious schools. Individual freedom should be considered and immunization should never be given coercively. Best method of intervention would be through behavior change communication by empowering community. Health system should emphasis on educating school children at early ages and teach pregnant

women during antenatal visits. Programs to upbringing scientific temper must be on effort.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

Necessary Ethical Approval was obtained from Institutional review board of Annamalai University and Ministry of Health, Kerala State.

ACKNOWLEDGEMENTS

This study was part of PhD thesis of Annamalai University. The primary Investigator is grateful to Annamalai University.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Doherty M, Buchy P, Standaert B, Giaquinto C, Cohrs DP. Vaccine impact: Benefits for human health. *Vaccine*. 2020;34:6707-6714.
2. Lazarus JV, Ratzan SC, Palayew A. A global survey of potential acceptance of a COVID-19 vaccine. *Nat Med*; 2020.
3. WHO. Immunisation Agenda 2030: A Global Strategy to Leave No One Behind; 2020.
4. Anyabolu O. Understanding the caregivers' perceptions about immunizing their children. *IJHSE*. 2017;3:16-26.
5. NFHS 4 Report. District fact sheet Malappuram Kerala; 2016. Available:http://rchiips.org/nfhs/FCTS/KL/KL_Factsheet_592_Malappuram.pdf
6. Nayar R, Nair A, Shaffi M, Swarnam K, Kumar A, et al. Methods to overcome vaccine hesitancy. *Lancet*. 2019;393.
7. Sikder R, Mukherjee D, Pattanayak U, Majumdar KK, Kundu SS, Dey R. Prevalence of vaccine hesitancy and its associated factors in an urban area of West Bengal, India. *Int J Community Med Public Health*. 2020;7:3443-9.
8. Paul S. Accountability in public services exit, voice, and control: *World Development*.1992;20(7):1047-60.

9. Paap A, Stephan W, Craig T, Gregory L. Belief in Conspiracie. Political Psychology. 1999;20(3):637-647.
10. Zonis M, Joseph CG. Conspiracy thinking in the Middle East, Political Psychology. 1994;15:443-459.
11. Wilson SL, Wiysonge C. Social media and vaccine hesitancy. BMJ Global Health. 2020;5.
12. Hornsey MJ, Harris EA, Fielding KS. The psychological roots of antivaccination attitudes: A 24-nation investigation, Health Psychol. 2018;37(4):307-315.
13. Harvey V, Sherley M. Meeting the challenges of vaccine hesitancy, The Sabin Aspen Vaccine Science Policy Group; 2020.
14. Chirico F. Vaccinations and media: An ongoing challenge for policy makers. J Health Soc Sci. 2017;2(1):9-18.
15. Stahl JP, et al. The impact of the web and social networks on vaccination: New challenges and opportunities offered to fight against vaccine hesitancy. Med Mal Infect. 2016;46:117-22.
16. Sementelli Arthur. Images in public administration: Using popular media to bridge theories and practices. Journal of Management Development. 2009;607-621.
17. Diem Susan J, Lantos John, D Tulsy, James A. Cardiopulmonary resuscitation on television. The New England Journal of Medicine. 1996;1578-82.
18. Zhang EJ, Chughtai AA, Heywood A, et al. Influence of political and medical leaders on parental perception of vaccination: A cross-sectional survey in Australia. BMJ Open. 2019;9:e025866. DOI: 10.1136/bmjopen-2018-025866
19. Kabat G. Trump: Vaccines and science under threat, Forbes; 2017.
20. Allen A. RKK Jr says Trump still wants vaccine safety commission, Politico; 2017.
21. WHO. Report of the Global Vaccine Action Plan; 2013.
22. Dhawan V, et al. Operational guidelines, strengthening immunization to reach every child. MOFHW; 2019.

© 2021 Binub et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/65745>