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Case

Vaccine Literacy: A Case-Based Brief Review on Overcoming Vaccine Hesitancy

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Abstract

Vaccine hesitancy, recognized by the World Health Organization as one of the top ten global health threats, continues to challenge public health efforts worldwide by lowering vaccination coverage. This case describes a five-day-old infant who presented with swelling and redness at the hepatitis B vaccination site after the family refused further medical care, vitamin K administration, and neonatal screening, instead applying traditional leech therapy. The mother had not been vaccinated during pregnancy, and the family rejected any discussion about immunization. This situation exemplifies how insufficient vaccine and health literacy can lead to misinformed, high-risk health behaviors. Addressing misinformation, improving communication between healthcare professionals and families, and fostering trust are vital to overcoming vaccine hesitancy. Strengthening vaccine literacy at both individual and community levels is essential for enabling informed decisions and maintaining public health protection.

Keywords: Vaccination, health literacy, Vaccine Hesitancy

INTRODUCTION

Vaccination, one of the cornerstones of public health, faces challenges due to vaccine hesitancy despite its success. Vaccine hesitancy causes vaccination rates to decline, which is recognized as a global health threat. In this case, it is necessary to increase vaccine literacy and enable individuals to make informed decisions.

Case

A five-day-old infant, born to a 22-year-old primiparous mother, was brought to the pediatric emergency department with swelling, redness, and tenderness on the anterior aspect of the left thigh. The infant had received routine hepatitis B vaccination in the left thigh postnatally. However, the family, resistant to any injection, engaged in a verbal altercation with healthcare personnel and left the hospital against medical advice. Following discharge, the family opted for leech therapy* on the site of vaccination to cleanse the infant's blood from the vaccine residue. They also opposed the administration of vitamin K. It was revealed that the mother did not receive vaccinations during pregnancy. The family stated that the mother is a housewife, while the father works in his own business, and they expressed a reluctance to discuss or receive information about vaccinations. They also expressed a refusal to undergo newborn hearing screening and declined neonatal heel prick screening of the baby. This case highlights the potential complications arising from non-compliance with standard medical recommendations and the use of alternative therapies

*Leech therapy is a traditional treatment method that involves using medicinal leeches (Hirudo medicinalis). This practice is founded on the principle that leeches attach to the skin, draw blood, and leverage the therapeutic properties of the bioactive substances found in their saliva.

DISCUSSION

It is well known and widely accepted that with the invention of vaccination, health outcomes stepped into a new age. However, from the very beginning of vaccine practices, vaccine hesitancy has been a significant obstacle. Despite the success of vaccination programs reducing the incidence of vaccine-preventable diseases worldwide, many people today do not encounter the devastating consequences of these diseases, leading

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to a gradual decline in attention to vaccination (1). By increasing vaccine literacy, we can help individuals make informed decisions, separate fact from fiction, and understand the crucial role of vaccination in maintaining public health (2). This article aims to review the components of vaccine literacy, how it can be developed, and ways to address the underlying causes of vaccine hesitancy.

The World Health Organization (WHO) declared that vaccine hesitancy is one of the top ten global health threats (3). Vaccine hesitancy is determined by the complacency, confidence of individuals, and convenience in access to vaccines.[3] Vaccine hesitancy results in a decrease in vaccination coverage globally. WHO data show that overall vaccine coverage dropped from 86% in 2019 to 81% in 2021 (4). In Turkey, the number of families refusing to vaccinate their children was 183 in 2011, whereas by 2018, this number had increased to twenty-three thousand families (5). A previous study in Turkey reported a vaccine refusal rate of 3.5‰ in 2016 and 5.9‰ in 2017 (6). The highest vaccine refusal rates among children under 2 years old were observed in West Anatolia (10.9%) and East Marmara regions (10.9%) in 2017 (6). In that study, one-quarter of Family Health Units reported at least one vaccine refusal case. While there is no explicit mandatory vaccination law, the Turkish Civil Code emphasizes child welfare and the state's responsibility to protect children's health. This framework allows health authorities and courts to intervene when a child's health is at risk due to parental refusal of vaccination (7).

With the widespread use of the internet, access to information is easier. Likewise, misinformation is a step to overcome to reach trustworthy data. Misinformation on vaccination can be overcome by the constitution of vaccine literacy. Vaccine literacy is the concept of understanding what vaccination stands for and helps individuals accept vaccination.

Vaccine literacy is regarded as the most extensive proportion of health literacy (8,9). Health literacy is defined as "the knowledge and abilities to meet the complex demands of health in modern society" by Biasio (10). It leads people to make appropriate health decisions for themselves by understanding basic health information and avoiding riskier behaviors and less healthy choices. When health literacy is limited, individuals experience difficulties in self-management, leading to poor health outcomes, increased hospitalization rates, and higher healthcare costs (11). As seen in the case presentation, the family's refusal of heel prick screening and immunization reflects a lack of understanding of preventive measures for newborns, indicating low health literacy within the family. By rejecting these interventions, the family unknowingly puts their newborn at risk of preventable complications that could have been identified through heel prick screening and immunization.

Vaccine literacy includes not only knowledge about vaccines but also a system that is able to convince a person of the importance of vaccination and leaves no hesitation by building communication and engagement (12).

Ratzan et al. defined the fundamentals of vaccine literacy in eight key points:[1]

1. Updated and comprehensible information based on scientific facts
2. To be able to distinguish fact from fiction
3. Promote people to ask questions
4. Answering the questions in a clear, simple, and confident way
5. Understanding the risks and benefits of vaccination for self and society
6. Provide accessible education about vaccination
7. Right-minded policies that promote vaccination and equity
8. To be straightforward about vaccine quality, safety, and efficacy

However, the impact of factors such as the judgment and decision-making ability of individuals, and whether they have a say in their own health, should also be taken into account (Figure 1).

In a qualitative study conducted in our country, in which healthcare workers were investigated in terms of vaccine refusal risk factors, they concluded that all reasons for vaccine hesitancy would be able to be eliminated by vaccine literacy. They suggested that providing information before their visit to the health center would

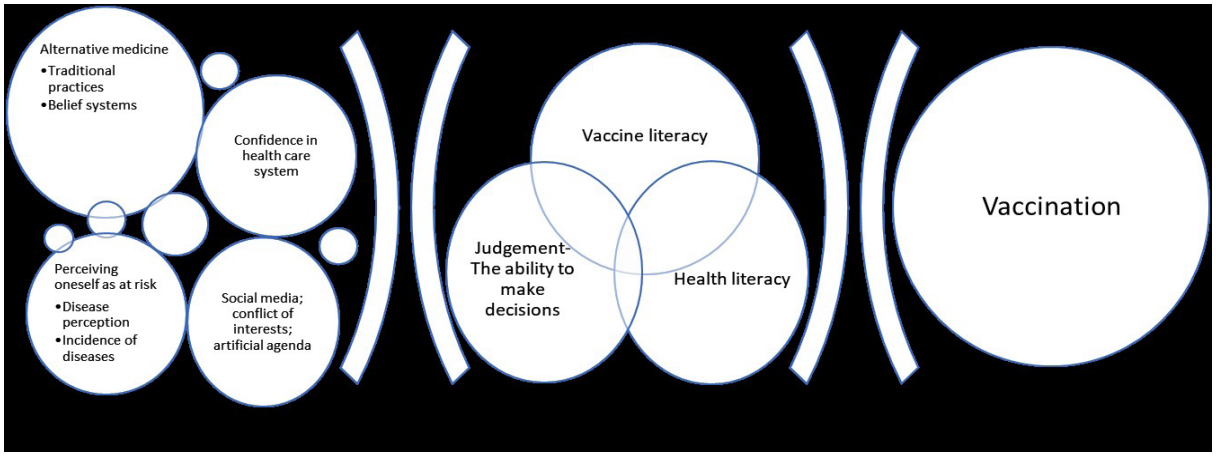

Figure 1. Factors associated with individuals' decision to vaccinate

enhance parents' knowledge so that they wouldn't fall for misinformation on social media, and this would increase parental collaboration with childhood vaccination.[13] It is best to enhance the knowledge of healthcare workers first, based on updated scientific literature. More specifically, they highlighted that performance criteria of obstetricians should include pregnancy vaccinations to increase the acceptance of vaccines both for doctors and pregnant women. They speculated that if a woman is vaccinated during pregnancy, her approval of childhood vaccinations as a mother would be more significant (13). Studies have been conducted on the Vaccine Hesitancy Scale in our country, which will provide societal data on vaccine hesitancy, and its validity has been confirmed (14).

More skilled and highly educated parents have lower vaccine acceptance, which shows that being educated doesn't mean being health literate (10,15). On the contrary, in a study investigating the vaccine literacy of the Italian population, it was found that lower socioeconomic status was associated with lower vaccine literacy (16). Likewise, the European Health Literacy Population Survey emphasized that in several countries, such as Austria, Bulgaria, Hungary, Ireland, Italy, Norway, Portugal, and Slovenia, vaccine literacy is lower in those with poor self-perceived health status (17).

On the other side of the story, anti-vaccine activists create conflict in people's minds by manipulating misinformation (7,13). The skepticism they advocate is based on false and fallacious information. Even though science is clear about the risks and benefits of the vaccines in use today, it is important to bridge science and society to save people from the seduction of speculation. With the efforts of healthcare workers, providing trustworthy information can influence people's decisions about vaccination positively. Opportunities to emphasize the importance and necessity of vaccines should not be missed (7,13).

CONCLUSION

Raising vaccine literacy is the solution to decreasing vaccination coverage rates. Strengthening both community engagement and professional competence is essential for bridging the gap between scientific knowledge and vaccine acceptance. Enhancing vaccine literacy through effective healthcare communication may help reduce vaccine hesitancy.

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REFERENCES

1. Ratzan SC, Parker RM. Vaccine literacy—helping everyone decide to accept vaccination. J Health Commun. 2020;25(10):750-752. doi:10.1080/10810730.2021.1875083
2. Oflu A, Yalçın SS. Relations of maternal health literacy and parenting practices with early childhood development: a cross-sectional study. Int J Environ Health Res. 2024;34(3):1540-1550. doi:10.1080/09603123.2023.2227582
3. World Health Organization. Ten health issues WHO will tackle this year. Published 2019. Accessed December 24, 2022. https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019
4. World Health Organization. Immunization coverage. Accessed December 24, 2022. https://www.who.int/en/news-room/fact-sheets/detail/immunization-coverage
5. Bora B, et al. T.C. Sağlık Bakanlığı Sağlık İstatistikleri Yıllığı 2017 [Health Statistics of 2017 from the Health Ministry of Turkey]. Ankara: Sağlık Bilgi Sistemleri Genel Müdürlüğü, Sağlık Bakanlığı Yayınları; 2018:140.
6. Yalçin SS, Kömürlüoğlu A, Topaç O. Rates of childhood vaccine refusal in Turkey during 2016–2017: regional causes and solutions. Arch Pediatr. 2022;29(8):594-598. doi:10.1016/j.arcped.2022.06.005
7. Kömürlüoğlu A, Yalçin SS. Causes, management, and prevention of parental hesitancy in childhood vaccinations. In: Yalçın SS, ed. Frequently Encountered Problems in the First Two Years of Age. 1st ed. Ankara: Türkiye Klinikleri; 2021:9-17.
8. Badua AR, Caraquel KJ, Cruz M, Narvaez RA. Vaccine literacy: a concept analysis. Int J Ment Health Nurs. 2022;31(4):857-867. doi:10.1111/inm.12988
9. Biasio LR, Bonaccorsi G, Lorini C, Pecorelli S. Assessing COVID-19 vaccine literacy: a preliminary online survey. Hum Vaccin Immunother. 2021;17(5):1304-1312. doi:10.1080/21645515.2020.1829315
10. Biasio LR. Vaccine literacy is undervalued. Hum Vaccin Immunother. 2019;15(11):2552-2553. doi:10.1080/21645515.2019.1609850
11. Lorini C, et al. Health literacy and vaccination: a systematic review. Hum Vaccin Immunother. 2018;14(2):478-488. doi:10.1080/21645515.2017.1392423
12. Ratzan SC. Vaccine literacy: a new shot for advancing health. J Health Commun. 2011;16(3):227-229. doi:10.1080/10810730.2011.561726
13. Yalçin SS, Bakacak AG, Topaç O. Unvaccinated children as community parasites in a national qualitative study from Turkey. BMC Public Health. 2020;20(1):1087. doi:10.1186/s12889-020-09184-5
14. Önal Ö, Eroğlu HN, Evcil FY, Kişioğlu AN, Uskun E. Validity and reliability of the Turkish version of the Vaccine Hesitancy Scale. Turk Arch Pediatr. 2021;56(3):230-235. doi:10.5152/TurkArchPediatr.2021.20028
15. Biasio LR, Carducci A, Fara GM, Giammanco G, Lopalco PL. Health literacy, emotionality, scientific evidence: elements of effective communication in public health. Hum Vaccin Immunother. 2018;14(6):1515-1516. doi:10.1080/21645515.2018.1434382
16. Cadeddu C. The determinants of vaccine literacy in the Italian population: results from the Health Literacy Survey 2019. Int J Environ Res Public Health. 2022;19(8):4429. doi:10.3390/ijerph19084429
17. The HLS19 Consortium of the WHO Action Network M-POHL. International Report on the Methodology, Results, and Recommendations of the European Health Literacy Population Survey 2019–2021 (HLS19) of M-POHL. Vienna, Austria: Austrian National Public Health Institute; 2021. https://m-pohl.net/Results