Vaccines and Vaccinations

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Vaccinations have been established to have numerous benefits, especially when administered during childhood years. It is essential to understand what vaccines are before going into detail about vaccinations. Vaccines stimulate the body's immune system to produce antibodies to fight a disease even before contracting the disease. Health literacy is a factor that affects the health of any child, and it is also a critical factor in vaccinating children. This paper seeks to discuss the corrective measures and information concerning vaccinations and the benefits of vaccinations, especially in childhood. Hence, the rightful information about vaccinations is of significance in this paper, and future studies should focus more on how parents and adults can access this information.

History of Vaccines

From the ancient ages when Buddhist monks took snake venom to confer immunity to snake bites, vaccination has been a practice for a long. In the 17th century China, such practices involved smallpox immunization by smearing a piece of skin containing cowpox (Plotkin, Offit & Orenstein, 2008). However, standard vaccination technology was publicized by Edward Jenner in 1796, when he immunized a 13-year-old-boy against smallpox by inoculating him with the vaccinia virus cowpox (Plotkin, Offit & Orenstein, 2008). This event led to the formal development of the first smallpox vaccine in 1798. The practice continued, with mass immunizations conducted through the 1800s and 1900. Smallpox was eventually eliminated in 1979 from the world.

In the 19th century, Louis Pasteur also conducted a series of experiments that led to the development of the attenuated cholera vaccine (1897) and the inactivated anthrax vaccine (1904). The years from 1890 to 1950 were the climax of vaccine invention. Some of the vaccines made

included the Bacillis-Calmette-Guerin (BCG) used against Tuberculosis, plague vaccine, diphtheria vaccine in 1926, Pertussis vaccine in 1948, tetanus toxin inactivation using formaldehyde, among other discoveries. Viral vaccine technologies took shape in the 1950s, with the Salk and Sabin polio vaccines being developed (Plotkin, Offit & Orenstein, 2008). The advent of the polio vaccine has enabled the complete elimination of the disease from most parts of the world.

Vaccines for diseases such as rubella, mumps, and measles were also later developed. Currently, the globe is focused on eliminating measles through vaccination. As technology advances, so does vaccine development. 3D imaging technology and recombinant DNA process have eased vaccine invention (Leask et al., 2012). Application of molecular genetics, genomics, and biochemistry have seen the development of vaccines such as the recombinant hepatitis B vaccine, seasonal influenza vaccine, and the less reactogenic acellular pertussis vaccine. More effective vaccines are also being developed, including streptococcal, staphylococcal, shigella, and cytomegalovirus vaccines. Others are in the pipeline for addictions, autoimmune diseases, and allergies.

How Vaccines Work

Vaccines are products that teach the body's immune system how to fight a disease that it has never come across before ("What is a vaccine, and how do vaccines work? | Vaccine Knowledge", 2021). Vaccines stimulate the body's immune system to produce antibodies to fight a disease even before contracting the disease. Vaccines are some of the most vital medicines because they train the immune system to fight a disease even before it reaches the body. The importance of vaccines cannot be stressed enough, especially in children, because it helps protect them from various illnesses during their early life.

Most vaccines are made of weakened or inactivated components of a disease-causing organism (antigen). The weakened antigen cannot cause the disease but can stimulate an immune response. Modern vaccines do not contain antigens but have a backbone that can synthesize the antigen (Plotkin, Offit & Orenstein, 2008). When the vaccine is introduced into the body, an immune response gets evoked, just like it would happen when the actual disease invaded. This response triggers the body to manufacture antibodies and memory cells to fight the disease in the event of actual exposure. People who cannot receive vaccines for any reason can grow herd immunity by living among vaccinated individuals.

Resistance to Vaccination

It is estimated that 4 million children die annually from a disease that vaccines can prevent, and another four million are left disabled (Ramalingaswami, 1989). Vaccines provide more benefits than harm to the people because they protect them from avoidable diseases and keep their children from disabilities. Some cultures challenge vaccines' safety and morality because they believe that vaccines are dangerous drugs designed to harm their children. "Cultural Perspectives on Vaccination | History of Vaccines", 2021). These cultures have their understanding of vaccines. They need to be educated on the importance of vaccines and the risk they are taking, leaving their children unvaccinated ("Cultural Perspectives on Vaccination | History of Vaccines", 2021). This paper will provide information on vaccines when they are supposed to be administered to children and their benefits to children's health. The paper will also cover the religious and cultural understanding of vaccines and how they can change in the community.

There are well-known benefits of childhood vaccination. Generally, vaccine uptake rates are high in most developed countries. However, according to Leask et al. (2012), under-vaccination is correlated with two significant parental factors. The first relates to the socio-

economic disadvantage where parents or caregivers lack access to sufficient resources and logistics, despite any incentive to get their children vaccinated. The second element, according to this source, concerns the safety or usefulness of vaccines for parents.

Parental experiences with health practitioners are a crucial factor affecting parental attitudes to vaccination (Leask et al., 2012). A successful dialogue will resolve vaccine-supporting parents' concerns and encourage reluctant parents to embrace vaccines. Poor communication may lead to vaccine rejection or care dissatisfaction. Dempsey et al. (2006) highlights how vaccination acceptance greatly relies on parental involvement in decision-making and education about the vaccine. Both sources emphasize parental knowledge of the vaccine for approval. However, some of the vaccines' misconceptions are a real issue that is not well addressed in the sources.

Health Literacy

Health literacy is the extent to which people can get, process, and understand essential health information that they need to make informed health choices. Sufficient health literacy involves the ability to read and appreciate basic health-related resources such as appointment letters, prescription bottles and papers, and labels. A good health literacy will help a person take care of their health better and keep themselves and their family safe and healthy. Health institutions can help to enhance health literacy by aiding those who are not able to comprehend easily. They may use visual aid and other interventions to help this group understand the materials better.

Health literacy is a contributing factor to the health of any child. It is a critical factor in the administration of vaccines to children. According to Aharon et al. (2017), better health literacy is linked to lower vaccination rates. The article investigates this relationship between parents' health literacy and their outright decision-making regarding their child's vaccinations. The source

provides a comprehensive study of parents and their children. A wide range of data was collected from the study, such as knowledge, beliefs, and reliability.

The study identified that the health literacy concern has a severe determinant direct correlation with vaccination compliance. Although the source is not linked to identifying the most effective way of vaccination, it assists in telling the story from the parent's perspective. In this formation, it is practical to conduct a comprehensive survey for the informal resources considering parent's non-compliance. Although the study results are highly unpredictable, it is essential in representing vaccinations' erratic nature and their relationship to parents.

Vaccination Success and Penetration

In her article “How to Get More Parents to Vaccinate Their Kids,” Dina Maron (2021) focuses on the vaccination processes' financial and behavioral aspects providing various incentives for change. The article further describes the superstition of health workers on parents on the matter concerning vaccinating their children. On an upside, the various methods with which parents can vaccinate their children have been effectively recorded in light of which methods work. In the working ways, the recruiting of diverse community members becomes more enforcers of vaccines over time.

Further, the article discusses the issues concerning finances. Achieving high vaccination rates will depend on the willingness of people to pay for the process. The chain of financial gain is well documented, with the key players being physicians. The government may also stand to gain through attaining statistical data such as the number of children as well as the spread of the disease being vaccinated. On the downside, the article does not discuss the relationship between the financial incentives and the immunization rates as much as it may be influential in proposing new strategies, the generation of resistance since they may not have experienced the first-hand effects

of the diseases being immunized. This form of resistance to vaccination has been documented as being a contributing factor to the vaccination exercise.

Anderson et al. (2015) describes a more relevant outlook to the discussion. The article first describes the various statistical analyses of the vaccination process and the various diseases and how well they have been handled. The article proves useful from an early stance where different individual information such as the right question about vaccines is brought to light. Issues concerning vaccines' safety raise critical questions that may bar the parents from accessing the vaccines due to insecurity. This discussion of safety is critical and essential as it may be a contributing factor not mentioned in the earlier sources surveyed.

Sensitization

To convince parents to vaccinate their children, the correct information should be presented to them. This means that the right individuals cannot be acquired if accurate information has not been passed. Accessing the right information means having the right experts deliver the information firsthand to the community through training and community development programs. Considering these activities, it is essential to note that notifying the right individuals on the vaccinations means telling the parents. As earlier mentioned, the background to vaccinations is critical and well discussed in the article. The functioning methods and how well they prevent the diseases form the basis for the entire review.

From the article, it can be discussed that information is power. Having the correct information may convince the parents and even motivate them towards vaccination. The article, therefore, focuses on having the right information concerning the vaccination techniques. It is crucial to undertake vaccinations' instructions as required; hence, more sampling and witnesses to successful vaccinations may influence others about vaccinating their children.

This last article covers why parents hesitate to give their children vaccines, as earlier mentioned. Various factors affect the children's critical vaccination due to parents' refusal to deliver their child a vaccination. This source aims to provide motivation and obstacles for parents to demonstrate the vaccination process. A compelling study, shown by Williams et al. (2014), showed that parents hope that they will develop immunity against contracting the disease. In this effect, it is critical to understand that the various changes are envisioned by parents, such as injecting a vaccine, maybe a shortcut to achieving the desired state of immunity.

Conclusion

Vaccination allows greater and more significant and critical installation of a healthier population. Also, vaccination brings forward longer life for all with a keen appreciation for infants and children whose immune system has not been reinforced with the vaccine-motivated immune system. As a society, the outlook of the vaccine can be said to be safer as the vast diseases of the past may not afflict them due to advanced technology and the population's health literacy. Despite the paradigm shift indicated by the advancement of more informative rallying individuals to vaccinate the infants, the exercise still faces vast challenges with various contributing factors such as finances and the working methods. In general, the research presented is keen on the importance of human factors and their application to human health matters. Although there was a wide range of responses from the parents on the reluctance, the data support that parent behavior may influence the manner and whether the vaccinations can be administered. In a straightforward discussion, parents' formal indulgence in the talks concerning vaccinations can be an upside to the activity.

References

Amit Aharon, A., Nehama, H., Rishpon, S., & Baron-Epel, O. (2017). Parents with high levels of communicative and critical health literacy are less likely to vaccinate their children. *Patient Education and Counseling*, *100*(4), 768-775. https://doi.org/10.1016/j.pec.2016.11.016

Anderson, V. (2015). Promoting Childhood Immunizations. *The Journal for Nurse Practitioners*, *11*(1), 1-10. https://doi.org/10.1016/j.nurpra.2014.10.016

Cultural Perspectives on Vaccination | History of Vaccines. Historyofvaccines.org. (2021). Retrieved 6 April 2021, from https://www.historyofvaccines.org/content/articles/cultural-perspectives-vaccination.

Dempsey, A. (2006). Factors That Are Associated with Parental Acceptance of Human Papillomavirus Vaccines: A Randomized Intervention Study of Written Information About HPV. *Pediatrics*, *117*(5), 1486-1493. https://doi.org/10.1542/peds.2005-1381

Leask, J., Kinnersley, P., Jackson, C., Cheater, F., Bedford, H., & Rowles, G. (2012). Communicating with parents about vaccination: a framework for health professionals. *BMC Pediatrics*, *12*(1). https://doi.org/10.1186/1471-2431-12-154

Maron, D. (2021). *How to Get More Parents to Vaccinate Their Kids*. Scientific American. Retrieved 6 April 2021, from https://www.scientificamerican.com/article/how-to-get-more-parents-to-vaccinate-their-kids/.

Plotkin, S. A., Offit, P. A., & Orenstein, W. A. (2008). *Vaccines*. Place of publication not identified: Elsevier Inc.

Ramalingaswami, V. (1989). Importance of Vaccines in Child Survival. *Clinical Infectious Diseases, 11*(Supplement_3), S498-S502. https://doi.org/10.1093/clinids/11.supplement_3.s498

What is a vaccine, and how do vaccines work? | Vaccine Knowledge. Vk.ovg.ox.ac.uk. (2021). Retrieved 6 April 2021, from https://vk.ovg.ox.ac.uk/vk/how-do-vaccines-work.

Williams, S. (2014). What are the factors that contribute to parental vaccine-hesitancy and what can we do about it? *Human Vaccines & Immunotherapeutics, 10*(9), 2584-2596. https://doi.org/10.4161/hv.28596