

**STRATEGIES TO IMPROVE CHILDHOOD IMMUNIZATION
COVERAGES: AN INTEGRATED LITERATURE REVIEW**

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ABSTRACT

Globally, childhood vaccinations are estimated to prevent 2.5 million deaths annually. But 19.7 million children under the age of one year have missed receiving basic vaccinations. It is important to identify, understand and promote strategies and interventions that have been proven to increase vaccination coverage among children. This review identifies strategies that were proven effective in increasing childhood immunization coverage through Integrated Literature Review (ILR). This review was identified through electronic database from PubMed and EBSCO within the timeframe, 2014 to 2019. Seven articles were included in this study. The results of this study were synthesized and narratively reported. The result showed that health provider-based intervention, interference for parents, community and government-based interventions are effective strategies to improve childhood immunization coverage/rates. It is recommended that improved immunization coverage depends not only on health provider factor, but collaboration with parents, health care providers and the government is needed. Overall, the literature shows many promising strategies. Future research must focus on best practices and comprehensive strategies that can be applied in a variety of patient populations and clinical settings.

Keywords: *strategies, interventions, childhood immunization*

INTRODUCTION

Immunization is one of the most cost-effective ways to ensure healthy lives and well-being. Every year, vaccines save 2–3 million lives, while millions more are protected from disease and disability (Gavi: The Vaccine Alliance, 2018a). The sustainable development goals (SDGs) recognize vaccines as an essential factor in ensuring healthy lives and promoting well-being for people all over the world. Immunization is the only intervention that brings most children and their families into contact with primary health services five or more times during the first year of a child’s life (Gavi: The Vaccine Alliance, 2018b).

Globally, childhood vaccinations are estimated to prevent 2.5 million deaths annually (Ostermann et al., 2019). Brown et al. (2015) show that vaccines are given at recommended scheduled intervals. The timing and spacing of vaccine doses are two of the most important issues in the appropriate use of vaccines. Studies have shown that the right doses at the right interval through the right route generate the optimal immune response. Untimely receipt of immunization can expose children to the risk of vaccine-preventable diseases (VPDs) with their associated morbidity and mortality. Brown and Oluwatosin (2017) also state, that poor compliance to immunization schedules and completion of recommended vaccinations limit the effectiveness of vaccination. According to the World Health Organization (WHO), 12.9 million infants (nearly 1 in 10) did not receive any immunizations in 2016. Although many young children receive some primary immunizations, many are never fully immunized because of inaccessibility to adequate health care and follow-up (Seth et al., 2018).

Kazi et al. (2019) describes that a major reason for poor childhood vaccine coverage is the lack of awareness among parents and caregivers regarding the need for immunization and the importance of completing the entire series of vaccines. Barriers to timely immunization are multifaceted and include immunization system constraints (e.g., vaccine stock-outs, limited availability of health care providers), poor access to health facilities (e.g., transport cost, opportunity cost), lack of information (e.g., about the vaccination

schedule or community mobilizations), and negative parental attitudes and inadequate knowledge (e.g., lack of trust in vaccinators, poor knowledge of vaccination benefits, fear of vaccination side effects) (Ostermann et al., 2019). Effective and novel strategies are therefore required to enable the country to meet the WHO recommended 95% level for the sustained control of VPDs and reduce under-five mortality (Brown & Oluwatosin, 2017).

New innovative and cost-effective techniques are necessary for practical solutions to improve vaccination uptake and coverage. The review objective into identifying strategies implemented to improve immunization coverage.

Literature Review

Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease. Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases and is estimated to avert between 2 and 3 million deaths each year. It is one of the most cost-effective health investments, with proven strategies that make it accessible to even the most hard-to-reach and vulnerable populations. It has clearly defined target groups; it can be delivered effectively through outreach activities; and vaccination does not require any major lifestyle change (WHO, 2019).

Immunization is one of the efforts that has been proven scientifically effective for the prevention of severe infectious diseases, in addition to breastfeeding for six months, balanced nutrition, increased personal hygiene and the environment which is also a basic need for general child health must be met. The importance of immunization is based on the idea that disease prevention is the most important effort in maintaining children's health. The immune system can recognize materials present in the body as "self" or "non-self." Foreign materials (non-self) are called antigens. When an antigen is recognized by the immune system, the immune system responds by producing antibodies (immunoglobulins) or directing special cells to

destroy and remove the antigen (Kyle & Carman, 2012).

Every infant is entitled to the best possible protection against disease. Obviously, infants cannot take proper precautions, so family caregivers and health professionals must be responsible for them. This care extends beyond the daily needs for food, sleep, cleanliness, love, and security to a concern for the infant's future health and well-being. Protection is available against several serious or disabling diseases, such as diphtheria, tetanus, pertussis, rotavirus, hepatitis A and B, polio, measles, mumps, German measles (rubella), varicella (chickenpox), Haemophilus influenza meningitis, pneumococcal diseases, and meningococcal disease, making it unnecessary to take chances with a child's health because of inadequate immunization (Klossner & Hatfield, 2010).

Although many of the immunizations can be given to individuals of any age, the recommended primary schedule begins during infancy and, except for boosters, is completed during early childhood. The recommended age for beginning primary immunizations of infants is at birth or within 2 weeks of birth. Children who began primary immunization at the recommended age but fail to receive all the doses do not need to begin the series again but instead receive only the missed doses. For situations in which there is doubt that the child will return for immunization according to the optimum schedule, HBV vaccine (HepB), DTaP, IPV (poliovirus vaccine), MMR, varicella, and Hib vaccines can be administered simultaneously at separate injection sites. Parenteral vaccines are given in separate syringes in different injection sites (Hockenberry et al., 2017). In the United States, two organizations, the Committee on Infectious Diseases of the American Academy of Pediatrics, and the Advisory Committee on Immunization Practices of the Centers developed optimal vaccine recommendations. In Canada, recommendations are from the National Advisory Committee on Immunization under the authority of the Minister of Health and Public Health Agency of Canada. The policies of each committee are recommendations, not rules, and they change because of advances in the field of immunology.

The concerted global effort to use immunization as a public health

strategy began when the World Health Organization (WHO) launched the Expanded Programme on Immunization (EPI) in 1974, following the successful global smallpox eradication programme. When the EPI was launched, WHO recommended a standard immunisation schedule covering six basic antigens [i.e., tuberculosis (Bacille Calmette-Guérin (BCG)), polio, diphtheria, tetanus, pertussis, and measles], which are generally referred to as traditional EPI vaccines (Oyo-Ita et al., 2016). WHO recommended 95% level of universal child immunization coverage for the sustained control of VPDs and reduce under-five mortality (Brown & Oluwatosin, 2017). Immunization coverage is a proportion of vaccinated individuals amongst the target population. It is one of the most important indicators of a successful immunization programme.

Vaccines for routine immunizations are among the safest and most reliable drugs available. However, minor side effects occur after many of the immunizations, and, rarely, a serious reaction may result from the vaccine. Health providers need to be aware of the reasons for withholding immunizations, both for the child's safety in terms of avoiding reactions and for the child's maximum benefit from receiving the vaccine. Unfounded fears and lack of knowledge regarding contraindications can needlessly prevent a child from having protection from life-threatening diseases (Hockenberry et al., 2017).

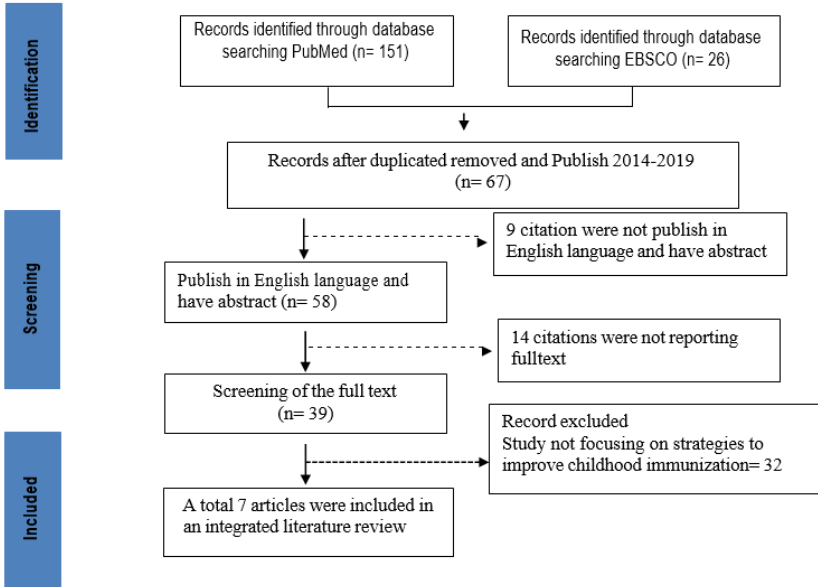
METHODOLOGY

An Integrated Literature Review was conducted to identify strategies implemented to improve immunization coverage. This study used Toraco (2005) framework. This framework has five stages of implementation, namely: Identify an appropriate topic, justify literature review methodology, search literature, analyze and critique the literature, and synthesize results. The procedure of the search strategy was presented using the PRISMA flow diagram. The literatures were searched by relevant databases (EBSCO & PubMed). Databases search using the terms childhood immunization, strategies, improve, with criterion of exclusion is the study not focusing on strategies to improve childhood immunization. The criteria of inclusion are: published within 2014-2019, must have abstract and full-text paper,

and literature in English. Data were appraised critically and reviewed using the narrative approach. The detailed procedure of the search strategy is given in figure 1.

Figure 1

Flow diagram of the reviewing process according to PRISMA



RESULTS

The literature search results above produced 177 articles. But after being reduced by repetition of articles, inaccessible and not in accordance with the inclusion criteria, only 7 articles were matched. These articles explored strategies to improve childhood immunization coverage.

Johri et al. (2015) in their study found that demand-side interventions, educational approaches plus use of incentives were effective strategies to improve childhood immunization coverage. Ventola (2016) identified three categories for interventions to overcome vaccine noncompliance: increasing community demand for vaccination, enhancing access to vaccination services, and provider-

based interventions. These strategies are based on The CDC's Task Force on Community Prevention Services.

Nelson et al. (2016) identified 15 articles examining 14 interventions to improve routine immunization coverage in urban areas. They categorized the intervention in each study into one of three groups: interventions aiming to increase utilization of immunization services; interventions aiming to improve availability of immunization services by healthcare providers; or combined availability and utilization interventions. All were studies reported positive to improve routine immunization coverage.

Oyo-Ita et al. (2016) found that regular immunization outreach, home visits, and integration of immunization with other primary healthcare services (such as intermittent preventive treatment of malaria) may improve immunization coverage. They also found that giving information to parents about the importance of vaccinations during visits to health clinics combined with specially designed 'reminder-type' immunization cards may improve immunization coverage. However, there was low-certainty evidence that household monetary incentives (in the form of conditional or unconditional cash transfers) may have little or no effect on immunization coverage.

Frew and Lutz (2017) showed that interventions for parents, interventions for providers, and interventions for clinics and communities can improve pediatric immunization rates. While Robinson (2018) revealed that making immunization mandatory for childcare or school entry, financial incentives, implementing immunization registries at the provincial/territorial level, educating parents about vaccine-preventable diseases can ensure their children to be fully immunized. Moreover, Nour (2019) stated that technological, mass marketing or campaigning, and direct communication are effective to encouraging vaccination coverage.

DISCUSSION

Based on the results of studies, there are many strategies implemented to improve routine immunization coverage. This review

has identified three strategies for interventions to improve childhood immunization coverage: Health provider-based intervention, intervention for parents, and community and government-based intervention.

Health Provider-Based Intervention

Ensuring high immunization coverage is very important for a healthy community. Immunization is a multi-sectoral activity. This activity is influenced by various demographic, socio-economic and political structures; and factors such as health service recipients, health service providers and government policies. Studies show that when immunization coverage is low, vaccine preventable disease (VPD) contributes to poorer health outcomes.

Oyo-Ita et al. (2016) revealed that interventions targeting providers included training in continuous supportive supervision, development of supportive supervision guidelines, and tools for immunization district managers. Studies have consistently shown that absent or weak recommendations from health care providers are primary drivers of poor vaccine uptake. Consequently, it is important to develop interventions that target health care providers and their practices including patient counseling and automated Electronic Medical Records (EMR)-based reminder systems, and other provider-based interventions (Ventola, 2016).

Studies have shown some of the health provider-based interventions to improve childhood immunization coverage including: Provide parent counseling (e.g. be informed about vaccinations, provide patient reminders), maximize opportunities for immunization (e.g. issue a standing order to allow nurses to administer patient vaccinations), recommend combination vaccines (minimizes the number of injections and reduces need for return vaccination visits), develop accessibility to immunization (e.g. provide convenient office hours and limit patient wait time), and use Electronic Medical Records/EMR (e.g. set electronic alerts for needed vaccinations) (Nour, 2019; Oldfield & Stewart, 2016; Temoka, 2013; Sharts-Hopko, 2009).

Intervention for Parents

Parents are the key in looking after and caring for children. Children can grow and develop healthy, both physically and mentally, depending on parents. To make it happen, parents must always pay attention, supervise, and care for their children especially at the beginning of their child's life during infancy. Parental involvement is needed to prevent child health problems (Hockenberry et al., 2017).

The low coverage of childhood immunization cannot be separated from the role of good families in recognizing health problems. Parents tend to refuse basic immunizations for their babies because of lack of knowledge about health, lack of support from the family, fear of the child acquiring fever due to immunization given, far immunization place, busy parents, and the locations and times at which they are provided. Nelson et al. (2016) stated that parental education intervention can improve childhood immunization coverage.

Recommendations for designing and implementing parental education interventions included the provision of specific, directed messages that focused on logistical information, such as the time and location of immunization sessions, rather than general health promotion messages. To improve effectiveness of parental interventions, parental education must be targeted towards pre-identified high-risk communities. These interventions like the redesigned vaccination card, which required few resources and could be implemented within the existing structure of the routine immunization system, have the potential to achieve substantial cost benefits (Owais et al. 2011; Usman et al. 2009).

Johri et al (2015) also showed that education or knowledge interventions were effective to increase the demand for childhood vaccination. Interventions to improve vaccination outcomes are commonly grouped into those targeting health services delivery or supply (e.g., improving human resources training, and monitoring) and those that stimulate demand for vaccines (e.g., knowledge transfer or communication campaigns). Moreover, Robinson (2018) stated that parents should be notified automatically when their child is overdue

for an immunization.

Community and government-based intervention

Frew and Lutz (2017) identified that strategies aimed at communities have proven to be effective in increasing childhood immunization coverage. Community- and government-based approaches to enhance vaccination rates include increasing outreach and educational programs; using recall and reminder strategies; providing financial incentives; and offering vaccination at nontraditional sites (Ventola, 2016). Besides that, standing order protocols (SOPs), electronic health record (EHR) templates and interfaces, computerized interface registries (between clinical practices and the state), and standardized documentation and tracking streamline clinic workflow and minimize clinician burden were reported effective to improve immunization.

The sustainable development goals (SDGs) recognize vaccines as an essential factor in ensuring healthy lives and promoting well-being for people all over the world. Immunization coverage is the proportion of vaccinated individuals amongst the target population. According to the World Health Organization, 12.9 million infants (nearly 1 in 10) did not receive any immunizations. This review presents strategies that had been implemented to improve routine immunization coverage. This review has identified three strategies for interventions to improve childhood immunization coverage: Health provider-based intervention, intervention for parents, and community and government-based intervention. It is recommended that improved immunization coverage depends not only on one factor, but collaboration among parents, health care providers and the government. Overall, the literature shows many promising strategies. Future research must focus on best practices and comprehensive strategies that can be applied in a variety of patient populations and clinical settings.

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