

# Effect of Health Communication Models and School Students on Parental Behavioral Change towards Improved Immunization Coverage among Under Five Children

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**Abstract:** *A conceptual framework makes theoretical distinctions and organizes ideas of what is intended to be conveyed in a research. Poor immunization coverage of under five children is one such pertinent perennial research problem to world since decades. Campaigns have reached a saturation point in creating health behavior change with vaccine hesitant parents. How do we ensure that parents are well motivated to bring their children for immunization that consequently contributes to better immunization coverage? School students may perhaps play a significant role towards encouraging and influencing their own parents and neighbors through their knowledge. In order to improve immunization coverage successfully with sound scientific evidence, health promoters need to design all health programs using theoretical concepts like health communication models like Perceived Behavior Control Model (PBC) and Health Belief Model (HBM) for health promotion campaigns. PBC framework initiates a process where people are predicted to move between stages from pre knowledge, knowledgeable, approving, intending to practice and advocating for variety of preventative health related behaviors like immunization. HBM can be used as a pattern to evaluate or influence individual behavioral change.*

**Keywords:** Health communication models, school students, vaccine hesitant parents, immunization coverage, behavioral change

## 1. Introduction

A conceptual framework is a model with analytical tool in research having several variations and contexts. It makes conceptual distinctions and organizes ideas of what is intended to be conveyed. As communication is at the heart of who are we as human beings to exchange information, it signifies the symbolic capability. In health, communication has been at the realm of National health programs including immunization drive of under five children since many decades through health education campaigns. Consequently hundreds of thousands of children's lives has been saved from vaccine preventable diseases (VPD) by immunization [1,2]. But still VPDs are accountable for more than five lakh deaths annually in India [3].

As lack of awareness by parents has been found to be the main hurdle, efforts are needed on escalating demand for vaccination. When parents hesitate to bring their child for vaccination this may not be possible. In such a case then, how do we ensure that parents are well motivated to bring their children for immunization which in turn would contribute to better immunization coverage? Their own elder children who are school students may play a significant role towards encouraging their own parents and neighbors through their knowledge influence.

For adapting this strategy scientifically conceptual frameworks on health communication may provide answer when studied their relevance through literature for developing action protocols. Through this research various models are analyzed and by derivation of concepts it makes an effort to combine all stakeholders to improve immunization coverage through health communication strategy.

## 2. Literature survey on conceptual frameworks on health communication

Strong conceptual frameworks capture something real and do this in a way that is easy to remember and apply. It is the system of concepts, assumptions, expectations, beliefs and theories that supports and informs about research - a key part of research design (Miles & Huberman, 1994; Robson, 2011). Miles and Huberman (1994) defined conceptual framework as a visual or written product that describe either graphically or in narrative form, main things to be studied, key factors, concepts or variables and presumed relationships among them [4].

What is often called the „research problem“ is a part of conceptual framework and formulating the research problem is the prime work in a research study. Research problem functions (in combination with goals) to justify a research study, to show people why the research is important. Moreover this problem is not fully understood and we don't adequately recognize how to deal with; hence, we want more information about it.

There are four main sources for the modules that can be used to construct a conceptual framework for the research study: (1) researcher's experiential knowledge, (2) present theory and research, (3) pilot and investigative research and (4) thought research. All these sources have contributed in development of the conceptual framework for this research. It is derived from health communication theory. Health communication denotes study and practice of communicating promotional health information whose purpose of broadcasting is to persuade personal health choices by improving health literacy.

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Healthy People 2010 define health communication as „art and technique of informing, influencing, motivating individual, institutional and public audiences on important health issues“<sup>[5]</sup>. Public healthiness is „what we, as a society, act collectively to ensure conditions in which people can be healthy“<sup>[6]</sup>. When we amalgamate these two perspectives, a new meaning emerges: Public health communication is scientific growth, strategic propagation and critical assessment of pertinent, accurate, accessible and comprehensible health information communicated to and from intended audiences to advance health of public<sup>[6]</sup>.

U.S. Department of Health and Human Services defines health communication as „study and use of communication strategies to inform and pressurize individual and community decisions that enhance health“<sup>[7]</sup>. The field is gaining recognition in part because of its emphasis on combining theory and practice in accepting communication processes and shifting human health behavior. This approach is relevant at a time when many of threats to global public health (during diseases and environmental calamities) are rooted in human behavior<sup>[8]</sup>.

Immunization coverage of under five children is one such health problem that is looming world since deacades. Currently immunization prevent an estimated two to three million deaths each year in all age groups from polio, diphtheria, tuberculosis, tetanus, pertussis (whooping cough) and measles. It is not sufficient considering the mammoth investments vested in it by national and international Governments and organisations.

### 2.1 Health communication for immunization coverage

Why such health programmes have not achieved their targets set at regular intervals? Where is the gap in providing health services? The researcher experienced each year, over two decades that each generation of parents seeking treatment for their children, lack health promoting behavior primarily as a result of denied or deficient communication on health and are least motivated to take their child for immunization. There are multitude of theories that can be used in communication of health. There are no set guidelines for practitioners to lend a hand in selecting which model to use. Tones and Green (2004) list a series of questions that practitioner could regard before choosing models;

- Whether it includes all relevant variables?
- Will it make logical sense to use this model in a particular situation?
- Has someone used it for comparable purposes?
- Are there any studies to illustrate its use in a chosen area?

Often models assume some pre-contact with client or a person before an intervention can take place. For example, if you can identify barriers that client groups experience or attitudes that are mutual in relation to behaviours, it is easy to identify the topics to address. Communicating with the chosen target group before the intervention commences and enable one to foster a more bottom-up approach to health communication, making a transactional information exchange process possible. This research made an endeavour

to assess impact of advocacy through school students on vaccine hesitant parents through such models.

### 2.2 Significance on immunization coverage

It is generally believed that progress in last 20 years or so, has not been as rapid on this front as in other fields. Still 1 in every 20 children at national level, 1 in every 18 at rural area and 1 in every 29 at urban area die within one year of birth in India, whereas Millennium Development Goal (MDG) is 1 in 37 nationally<sup>[9]</sup>. The benefits of escalating cost-effective promotion strategies are the need of hour to a country like India contemplating inflation. Campaigns have reached a saturation point in creating health behavior change with vaccine hesitant parents. Hence there is an imminent need to step-up on vaccination front and further improvement<sup>[10]</sup>.

Thus born this research on immunization coverage with the present and future generations (parents and school students) adopting health communication theory. Two individual communication theories have been adopted in a matrix combination independently as conceptual frameworks in this research i.e. PBC model for school students and HBM for parents of < 5 children. Information Education and Communication (IEC) strategy using Child to Child and Parent (C-C-P) will be the intervention that proffer health promotion message on immunization in these models. Subsequent passage of content discuss various aspects and its practical application of two conceptual frameworks.

### 3. Perceived Behavior Control Model

The PBC was described by Population Communication centre / services for Communication Programs (2003) in US; it defines communication as a process where people can move between stages of PBC framework. (Fig 1 and 2). It consists of series of steps where a person moves upwards towards the final goal. In PBC people move through the following steps:

- Pre knowledge : when a person is unaware of risks or problems associated with their behaviour
- Eg: School students are unaware of risks or problems associated with their parents and neighbour's behaviour of un-immunizing their < 5 year children
- Knowledgeable: when a person is aware of risks or problems associated with their behaviour
- Eg: when school students are aware of risks or problems through IEC strategy with un-immunizing an < 5 year children in their household or neighbourhood
- Approving: when a person is in favour of changing their behaviour
- Eg: when school students are in favour of immunizing < 5 year children
- Intending: when a person is proposes to begin action to change their behaviour
- Eg: when school students are intending to disseminate the health message to their parents and neighbourhood
- Practicing: when the proposed behaviour is being practiced

- Eg: when school students communicate their knowledge on immunization and encourage the parents to immunize < 5 year children
- Advocating: when new behaviour is implemented and the person then advocates that behaviour to another.
- Eg: when school students actively advocate to their parents and neighbours for immunizing their < 5 year children

### 3.1 Application of PBC in practice

It is particularly useful when there is an access to a group thereafter allowing mapping of major beliefs that may help or hinder performance of behaviors. Another advantage of this model is the inclusion of „subjective norm“ letting focus on peer or family influences. Health campaign through C-C-P mode can be used to target on behavioral beliefs, normative beliefs and perceived behavioral control. Stead et al (2005) gave an overview with various health messages. Behavioral control messages focused on consequences of not immunizing their child, for example developing an infectious disease which may be fatal. Normative beliefs focused on how others perceived of having a neighbourhood child who is not vaccinated and perceived behavioral control by school students will remind parents that they could positively immunize their under five children.

## 4. Health Belief Model

Becker (1974) proposed HBM from the work of Rosenstock (1966). Of various models used to explain health behavior, HBM provides the most appropriate theoretical framework with which it can examine how parents think about

immunization and disease. This social cognitive framework developed in 1050s by US Public Health Service (Mullen, Hersey & Iverson 1987) is often used to explain and predict variety of preventative health related behaviors (Strecher & Rosenstock 1997). It can be used as a pattern to evaluate or influence individual behavioral change [11].

The model (Fig 3 and 4) proposes that a person's behavior can be envisaged based on how susceptible individual believes themselves to be [12]. „Vulnerability“ is articulated in HBM through „risk“- perceived susceptibility and seriousness of consequences – severity needs to be considered before a decision is taken. This means an individual should weigh up costs / benefits (Naidoo and Wills 2000) or pros / cons of performing a behavior. For example, how „susceptible“ parents feel their child is to contracting an illness like mumps and how „severe“ consequences of having mumps will be. A person's decision to perform health promoting (or damaging) behavior will be based on outcome of this „weighing up“ process.

When applied to parents' immunization behavior, HBM suggests that merely having information and understanding on infectious diseases shall not automatically result in increased visits to a hospital for vaccinations. Instead, model specifies 4 interconnected elements that must be present for knowledge on disease to be translated into protective action (Onta 1998). First, a person must recognize that he or she is susceptible to an infectious disease and then the person must perceive that if acquired VPD is a serious condition. Third he or she must believe that there are benefits to taking preventive action.

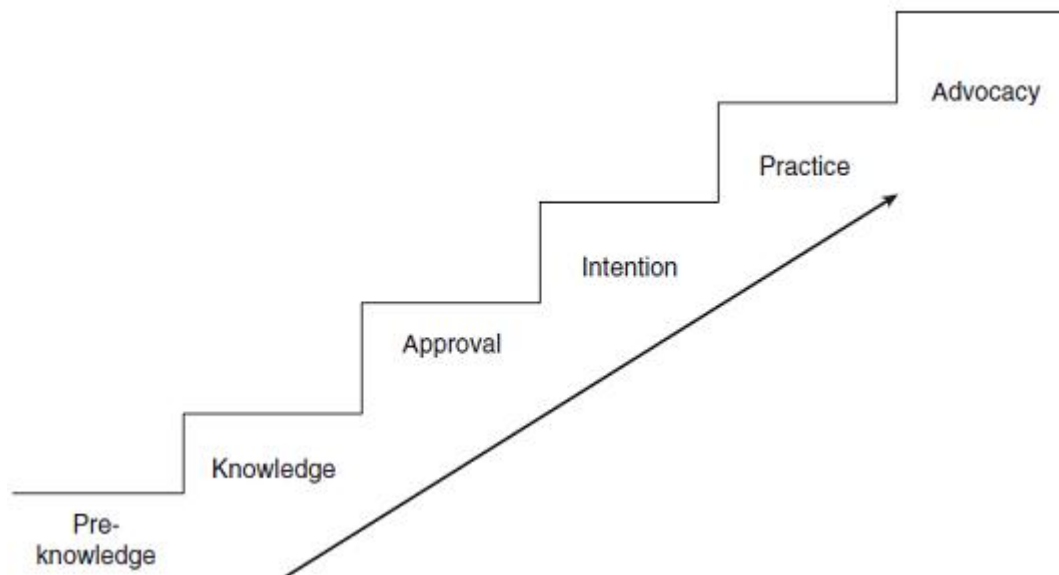
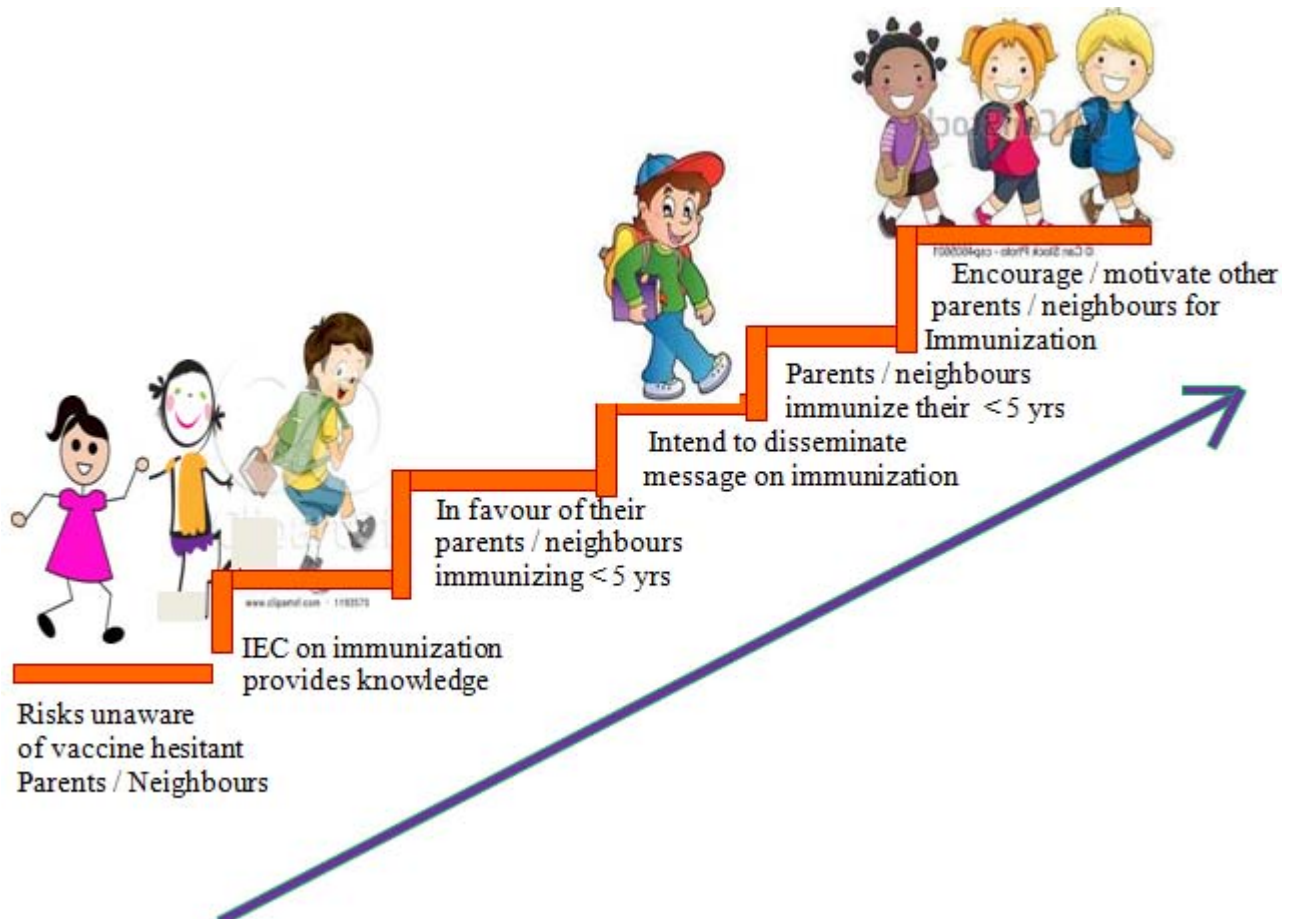


Figure 1: The perceived behavioural control (PBC) model, based on population Communication Services/ Centre for Communication programmes





**Figure 2:** Theoretical framework based on Perceived Behavioral Control model (for school students)

Finally individual should also recognize that any potential barriers to taking preventive actions are outweighed against potential benefits. Based on this model, perceived susceptibility, perceived severity and perceived benefits are likely to be positively related to immunization behaviour while barriers to taking action is likely to be negatively related to it.

A final variable completes original HBM: presence of an internal or external drive or „signal to action“, to prompt individual’s health behavior. An internal cue include symptoms of illness, whereas external cues are media campaigns on health promotion or interpersonal interactions like learning that a neighbour’s child has been affected by an infectious disease or interaction with school students advocating promotion of immunization.

More recently, concept of “self-efficacy” is added to HBM to facilitate prediction of actions. Self efficacy is a persons’s perceived buoyancy of their ability to perform that behaviour. Rosenstock suggests that self-efficacy was not clearly included in the early versions of HBM because original focus was on circumscribed preventative actions, such as giving immunization or accepting a screening test. Rosenstock (1990) proposes that self-efficacy is more helpful in understanding behaviors, such as those related to chronic illness care, that occur over a period of time and require lifelong changes in behaviors.

HBM includes four features that need to happen for a behavior change to occur:

- (i) The person needs to have an „incentive“. Eg: An „incentive“ for a parent whose < year 5 child is not fully immunized, could be the desire to make a decision about immunization for their child
- (ii) The person ought to sense there is a „risk“ of continuing the current behaviour Eg: By not taking preventive measures such as immunizing their child, a parent might feel that they are placing their child at „risk“ of contracting VPDs.
- (iii) The person must believe change will have „benefits“ and these need to outweigh the „barriers“ Eg: A parent may believe that the benefits of immunizing the < year 5 child means they are less likely to have VPDs. They also identify that the barriers to delay or not immunizing their child could be minor ailments or adverse reports that they come across. The „benefits“ must prevail over „barriers“ in order for a change to be made
- (iv) The person must have 'confidence' (self efficacy) to change their behaviour Eg: A parent must believe and are „confident“ on their capacity to immunize their < 5 year child and complete it.

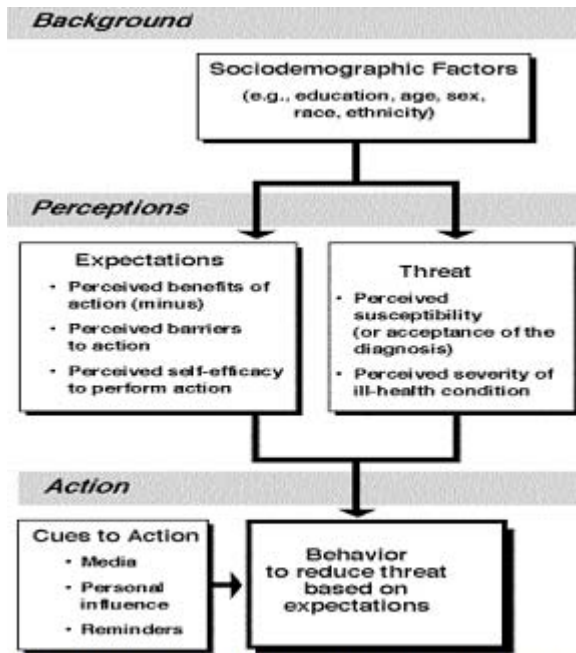


FIGURE 1. A Schematic Outline of the Health Belief Model Proposed by Rosenstock, et al., 1990

HBM also considers „modifying factors“ important to behavior change. These include demographic, socio-psychological and structural variables that influence how a person perceives disease severity, threats and susceptibility. Factors like age, gender, peer pressure or earlier contact with disease also impact on decision making process. One of the main strengths of four domains of HBM is that it is earnestly understood by clinicians and may facilitate constructive conversation with vaccine hesitant parents. While complete understanding of parents' decision-making processes would be valuable, obtaining comprehensive measures relating to multiple cues to action is imminent.

Thus HBM is a robust model to predict vaccine acceptability in parents for their children. Scores for knowledge, HBM constructs perceived - severity, susceptibility, benefits, barriers and cues to action improved over time while no significant findings were made for control groups. HBM has a gradient within the psychosocial domains which signifies that increased parental diffidence is associated with parents' decision to delay or refuse vaccination for their child resulting in lower vaccination coverage.

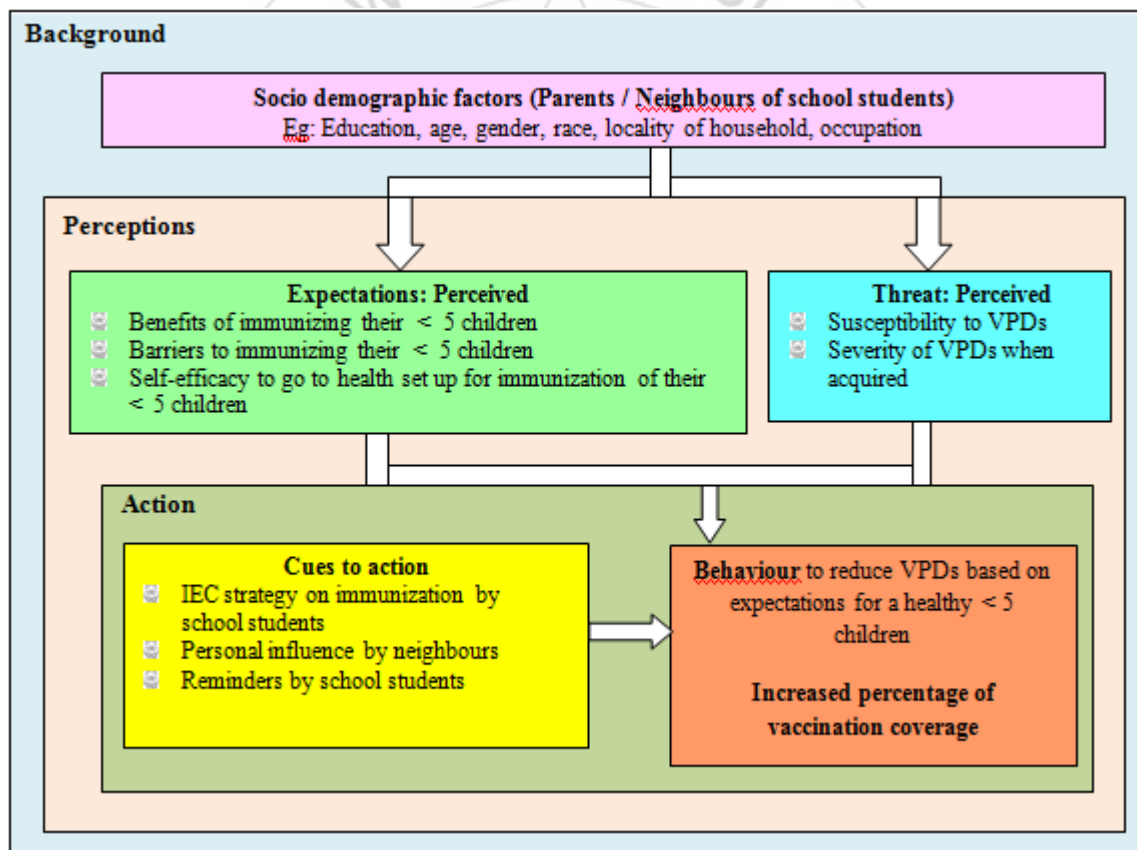


Figure 4: Schematic outline of the conceptual framework based on HBM by Rosenstock, et al (1990) (for Parents and Neighbours)

Further, it is important to note that various theories of behavior provide conceptual frameworks offering alternative explanation as to why parents delay recommended vaccine doses or fail to give all doses of recommended vaccines for their children [13-15]. However, this research has reported on HBM because of its historic importance in vaccination coverage research and its remarkable analogous in parents' sentiments during 1950s, when the model was developed till today.

Irwin Rosenstock, Mayhew Derryberry and Barbara Carriger of U.S. Public Health Service published their findings of systemic reviews in Public Health Reports [16] and showed four psychosocial domains that inclined parents' resolution to vaccinate children: (1) susceptibility - parents' judgment of their child' risk of getting affected with polio; (2) seriousness - their appraisal of risk being polio affected a sufficient health concern to warrant vaccination (3) efficacy and safety - their inference that vaccine is safe and

vaccinating their child reduce chance of their child' getting polio and (4) social pressures and convenience - concerns and persuasions facilitated or discouraged their decision to vaccinate child. These factors soon became basis for illustrious HBM that has been used throughout public health to describe why people adopt behaviors that lead to healthy lives [17-22]. Since Rosenstock's initial specification of HBM, [12] there have been successive refinements and improvements to the model [16].

#### 4.1 Application of HBM in practice

HBM can be applied to a variety of health behaviors. Interventions using this model usually aim to influence „perceived threat of disease“ variable and hence change susceptibility / severity balance. Key approach of doing this tends to direct information that has an emotional appeal or contains a strong fear or emotional response. Application of theory to practice is not an easy step. Health promotion in past has made use of theory infrequently and more so inconsistently. Jones and Donovan (2004) discuss that practitioners frequently pay no attention to theory, failing to use and implement theory based interventions. They suggest that practitioners lack skills and knowledge needed to exercise generic theories and models available. Consequently such a lack of theory based practice may not convince parents positively.

Who can persuade parents that appropriate immunization is in their child's best interests, if they have concerns about vaccines? Amount and type of information parents have about vaccines has varying effects on their acceptance of the idea of vaccinating their children. During polio vaccination campaigns in late 1950s and early 1960s which followed after establishing safety and efficacy of Salk vaccine, Rosenstock, et al observed that some parents' decisions to seek vaccination may be determined by social demands given by a person who is important to them [16].

This research suggests social marketing methods [17] to target vaccine hesitant parents who may consider delaying or denying vaccines and transmit positive messages to assure parents that vaccines are safe and vaccinating their children is an intelligent safety measure to protect their child's health. Language and lexical content of the message too is important. Lexical content means words that can be used positively or negatively. Utilization of words from complex medical parlance or abbreviating key terms can confuse target audience, whereas using repetition has been positively found to influence communication as taught to school students (Pechmann and Reibling 2000).

In spite of criticisms, HBM has been used successfully for over thirty years to understand health behaviors in a variety of circumstances. As Kirscht wrote in his analysis of model, it is „complex and unpredictable in its history, even though amazingly robust and useful“ (Kirscht 1988). Thus, it is a very constructive process for explaining health behavior - one that provides substantial power in predicting perceptions that underlie parents' immunization behavior.

Applied to vaccination choice, these theories and models can inform how and why parents make their choices.

Vaccination is in most cases an effective and safe means of preventing the spread of infectious diseases, but for parents the decision that they make can be complicated. Parental vaccination decision is influenced by multiple factors. The perceived susceptibility of their child to illness, perceived safety and efficacy of vaccines, their past experiences with vaccination and experiences of others, advice of professionals, their personal health beliefs, etc all have an impact on a parent's judgment. Making decisions on behalf of their children can be difficult and many parents whether they support vaccination or not decide to err on the side of caution – be it choosing to vaccinate or deciding not to.

#### 5. Conclusion

With its trans-disciplinary nature, environmental perspective, change orientation and audience based philosophy health communication has to make significant impact on health of public. It is no longer adequate that health promotion crusades are planned and implemented on an ad hoc basis and application of theory to practice in health programmes cannot be ignored. In order to promote health successfully with sound scientific evidence, health promoters need to design all interventions using theoretical concepts like health communication models for health promotion campaigns.

##### What is already known about this subject?

- Health communication models are known to exist theoretically in books and journal articles.
- Factors responsible for poor immunization coverage are highlighted enormously and a vaccine hesitant parent is one such reason.
- Very few projects like „hand wash“ campaign by UNICEF have subjected school students as stakeholders of health.

##### What are the new findings?

- School students can play a major role in influencing vaccine hesitant parents to give immunization to their under five children using health communication models.
- How this process can be adopted in immunization and other health campaigns in a phase wise manner has been identified and discussed in this research article.
- Evidence based scientific reason (from health communication theories) for a sound and guaranteed clinical approach in National Health programme is focussed to formulate health education strategies.

##### How might it impact on clinical practice in the foreseeable future?

- Practical application of health communication theory is demonstrated in a step wise manner in this research article which is feasible by any health worker at any level.
- Instead of droning health messages involving millions of funds, a more economical, optimal and highly rewarding approach linking school students as stake holders is sure to transform health scenario in any country.

*Permission from Institutional Ethical Committee of PIMS, Loni had been taken where relevant*



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