Chapter 1.
Introduction

Health is not a physical accomplishment but the manifestation of our awareness of who we are and integrity in living out of that knowledge.

—Dr. Rand Olson, Children of Promise: The Ultimate Guide to Raising Healthy Kids

Throughout history, social communication has served as a longstanding mechanism for fostering enduring changes in behaviour within societal contexts on a population-wide scale. Initially, social communication was linked with raising awareness by engaging an individual's inner realm, encompassing their cognitions, attitudes, and emotions (Earley, 2002; Smith, 2020). It has, however, evolved over the millennia, including Hippocrates writing about health and environment in the 4th century BCE, the rise of religious movements globally in the 2nd century BCE, including Buddhism and Zoroastrianism, and its current form, health communication.

The following definition of health communication was developed by the Society for Health Communication in 2017: 'Health communication is the science and art of using communication to advance the health and well-being of people and populations'. Health communication is an interdisciplinary domain of research and application that utilises creativity, theories, and strategies to promote habits, practices, policies, and behaviours that enhance the well-being and health of populations and individuals (Health Communication, 2016). The manner in which health communication is structured plays a pivotal role in influencing the health decisions made by a population.

Public health professionals acknowledge the critical role of health communication in shaping health promotion initiatives aimed at preventing diseases and fostering behavioural changes, ultimately contributing to an enhanced quality of life. In the current healthcare scenario, health communication has become the new face of social communication and can influence and empower individuals to make better health choices (Rural Health Promotion and Disease Prevention Toolkit, 2018).

Numerous governmental, for-profit, and non-profit organisations have undertaken extensive efforts to devise health communication interventions centring on awareness,

adherence monitoring, and reminders for immediate action (World Health Organization [WHO], 2003). The approach to health communication is methodically structured and emphasises the modulation of health-promoting strategies. Nevertheless, this approach tends to be paternalistic and instruction-oriented, placing less emphasis on encouraging information seeking, self-reliance, and the development of self-management and self-responsibility mechanisms that promote awareness of one's health and well-being.

While health communication predominantly targets acute health concerns, such as pregnancy, diabetes, HIV/AIDS, and COVID-19, its long-term implications and effects on sustainable behaviour change remain uncertain. According to the WHO (2010), the implementation of austerity measures by governments in many Western countries is strengthening the neoliberalist emphasis on individual self-responsibility in healthcare and public health (WHO, 2010). In a similar vein, Chapin et al. (2016) highlighted the importance of self-management and self-responsibility, which should contribute to health promotion strategies. Notably, they condemned the tendency to portray social groups and individuals as uninformed and lacking the ability or discipline to assume responsibility for their health. This shift in outlook is changing the healthcare discourse by encouraging individuals to take agency in their self-care. Thus, there is a need to re-examine existing intervention paradigms and design interventions that make individuals more aware of health behaviour by allowing them to bear the onus of decision making by reshapring their attitudes and beliefs.

Diverse age groups hold varying perceptions of risk, and disparities in their approach to risk are contingent upon individuals' attitudes, perspectives, and cultural factors. It is difficult for any health communication medium to design an intervention that caters to this diversity. This research attempts to acknowledge this diversity by encouraging health-promoting behaviour through the development of a social communication model. Specifically, it was conducted among female adolescents to increase awareness of their reproductive health and well-being. The aim of this research was to identify ways of developing communication that works at a metacognitive level to psychoeducate adolescents, making them self-reliant for the future course of their lives.

This chapter focuses on understanding the issues in existing health communication models, consequently identifying the need to redefine health communication frameworks and build a conceptual framework that addresses issues that affect programme efficacy.

1.1 Decoding Health Communication

Health communication has been essential in influencing health choices among different populations. Public health experts recognise the importance of health communication in public health programmes for disease prevention and behaviour change for a better quality of life. Over the years, health communication has transformed from a static one-way mode of communication to a dynamic medium with two-way, data-driven technology. This can be seen in its evolution, which has spanned advertisement campaigns on family planning in print (Elliott, 1971), messages regarding health and hygiene on broadcast media (Smith et al., 2011), tech-enabled health communication interventions based on analytics (Amarasinghe et al., 2018), and the use of social media (Bhattacharyya & Roy, 2016). Each of these offers significant opportunities in health communication (Stellefson et al., 2020), and their use has expanded the acceptance and adaptability of health communication programmes, which can now achieve high outreach among diverse and large populations.

With the evolution of technology-based interventions and the penetration of mobile technology, the 21st century has been recognised as the digital age of health communication (WHO, 2018). The emergence of Web 2.0 has consistently expanded the range of digitised health promotion practices (Dé et al., 2020; Dunn & Hazzard, 2019), including AI-enabled adaptive technology, Internet search engines, and social media-based data mining for the prevention or diagnosis of disease (Banerjee et al., 2020; Fogel & Kvedar, 2018). Social media platforms such as YouTube, Facebook, Twitter, and Instagram can adapt to the dynamic social context of their users using sophisticated technology, which has led to their success (Bughin et al., 2010).

The information assimilated from these sources is derived from big data processed and synthesised for behaviour analysis (Buhi et al., 2012; Korda & Itani, 2011), based on which communication strategies are designed and developed. Regardless of whether these communication strategies are further disseminated using moderated or unmoderated methods, interventions that are designed with an emphasis on visuals and voice modulation and built to fit specific contexts facilitate the ease of understanding (Joshi et al., 2011; Shoup et al., 2018).

1.2 Health Communication in the Public Health Sector

The majority of primary healthcare services prioritise disease treatment over prevention, resulting in an ongoing burden on healthcare providers. Doctors and healthcare workers have limited time in overcrowded hospitals, and patients lack reliable information. For

such scenarios, health communication has been a boon in the public health sector as it has worked on disease prevention and health promotion rather than treatment and maintenance (Joshi et al., 2011; Srinivisan, 2020).

There is a global consensus that it is possible to reduce disease morbidity effectively if individuals reliably engage in disease prevention behaviours. Non-communicable diseases contribute to 71% of annual global fatalities. To combat this issue, the WHO (2017) has acknowledged public health awareness campaigns as a 'best buy'. Accordingly, universal health coverage is essential, which the United Nations Sustainable Development Group (2023) emphasises in Universal Values Principle 2: 'Leave no one behind'. This principle recognises the advantages of health communication due to its cost-effectiveness, broad reach, and capacity to tailor messages for specific groups or individuals based on their geographical location. Such messages can undergo time analytics to evaluate their reach and engagement and be adjusted in real time to optimise their effectiveness (Rehman et al., 2021; Sousa et al., 2019).

The implications of health promotion practices are continually subjected to scrutiny and evaluation. Where people have recognised the benefits of such practices, they have been able to accept and adapt to technology. However, multiple factors contribute to and influence such behaviour, and some of these behaviours are willingly adopted by those who are interested in improving their physical fitness and health; in other cases, individuals are employed by agencies to conduct health interventions among specific target groups (Lupton, 2015; Reddy et al., 2020). While there are encouraging strides in technological innovation and acceptance, there is a paucity of substantial evidence indicating that these interventions consistently result in sustained behaviour change. This highlights the need for a fresh approach that includes new theories and interventions that are not imposed but empower individuals to be self-reliant by taking charge of their agency. Thus, gaining a deeper understanding of the underlying complexities hindering the effectiveness of any intervention is crucial.

In light of the growing acceptance and growth of digital technology, it has become imperative to foster a comprehensive perspective that considers both the negative and positive aspects. The emergence of digital health practices and promotion has underscored the significance of grasping the impact of misinformation and misconceptions, which possess the potential to distort and undermine the public's perception of public health matters (Gold et al., 2019). In specific contexts, limitations may manifest because of an increasing reliance on specific interventions. Evidence suggests that consumers have become overdependent on technology rather than becoming self-reliant by using tools such as alarms and pill reminders;

further, the integration and proliferation of intelligent systems, applications, and self-monitoring devices in the domain of digital health promotion has allowed the use of data on individuals' well-being- and health-related behaviour, thereby leading to further complexities (Lupton, 2015; Renfree et al., 2016). The field data indicate an imbalanced distribution between health seekers and healthcare providers, resulting in the need for frequent system upgrades and ongoing staff retraining and development.

Most health communication models work at the system level by defining strategies to manage and promote health behaviours. However, there needs to be more evidence of using health psychology concepts, models, and frameworks that can work at a metacognitive level to encourage self-reliance.

The following sections discuss the existing health communication frameworks commonly used by healthcare agencies.

1.3 Existing Health Communication Frameworks

Several agencies have formulated health communication frameworks that clearly define a systematic method of integrating and navigating health interventions. These frameworks are used extensively to plan and strategise for health promotion programmes. This section discusses three such programmes that work at different levels. The framework proposed by the WHO in 2017, known as the strategic communications framework for effective communications, is the most well-known. Other popular frameworks include the field guide by O'Sullivan et al. (2003) and the Periodic Table of Healthcare Communications (2018).

1.3.1 The WHO's Strategic Communications Framework for Effective Communications

The WHO recognised the need for an effective, integrated, and coordinated communication model that can be integral to building a healthier and better future for people worldwide. To that end, they proposed a comprehensive framework that outlines a strategic approach for effectually disseminating information, providing advice, and offering guidance on health issues. The framework (see Figure 1) comprises:

- Individuals: They are the health decision makers for their and their family's health. Programmes that target individuals cover topics such as childcare guidance, basic hygiene practices, norms, and protocols for travel in countries where infectious diseases are circulating.

- Healthcare providers: They are the agents for decision making regarding diagnostics and screening, treatment, and patient recommendations.
- Policymakers: They are the agencies at the national and subnational levels. Their responsibilities include investing in healthcare worker training, allocating funds to vaccination programmes, and establishing emergency operations centres.
- Communities: They are the groups or networks of people responsible for decision making for shared spaces, services, and activities with potential health impacts. For example, managing the removal of stagnant water in public spaces, ensuring that health facilities are near residences, and so forth.
- International organisations and stakeholders: These are the agencies responsible for decision making regarding the funding and implementation of health programmes, which includes assisting countries to improve their health and healthcare systems, financing initiatives aimed at reducing chronic diseases, and supporting public health research.
- WHO staff: They are the primary stakeholders responsible for decision making related to programme development, coordination, and allocation of human and financial resources.

Figure 1

The Strategic Communications Framework for Effective Communications

Note. From *WHO Strategic Communications Framework for Effective Communications* (p. 3), by World Health Organization, 2017 (https://cdn.who.int/media/docs/default-source/documents/communication-framework.pdf?sfvrsn=93aa6138_0). In the public domain.

The framework has been presented as a set of principles that can be applied to various health interventions. The audience for this framework includes health decision makers and representatives who use informational materials from the WHO for various health decisions. Furthermore, the structured format of the framework enables the process of integrating the programme; however, it is not associated with the content of the communication design and how that might affect an individual's behaviour.

1.3.2 O'Sullivan et al.'s (2003) Field Guide for Designing Health Communication Strategies

A Field Guide to Designing a Health Communication Strategy by O'Sullivan et al. (2003) is a comprehensive 300-page document that details each stage of an intervention in a

step-by-step process. It was published by the Johns Hopkins Center for Communication Programs and aims to offer hands-on advice to individuals who plan, execute, or assist health communication projects. The field guide is collaborative and participatory, aiming for effective strategic communication that converges ‘senders’ and ‘receivers’ (i.e., merging the differences between the two). It recognises the need for effective communication to make informed choices. The primary audience of the field guide includes policymakers, funding agency representatives, managers who design and implement healthcare programmes, and communication professionals who execute health communication strategies and design messages and other materials.

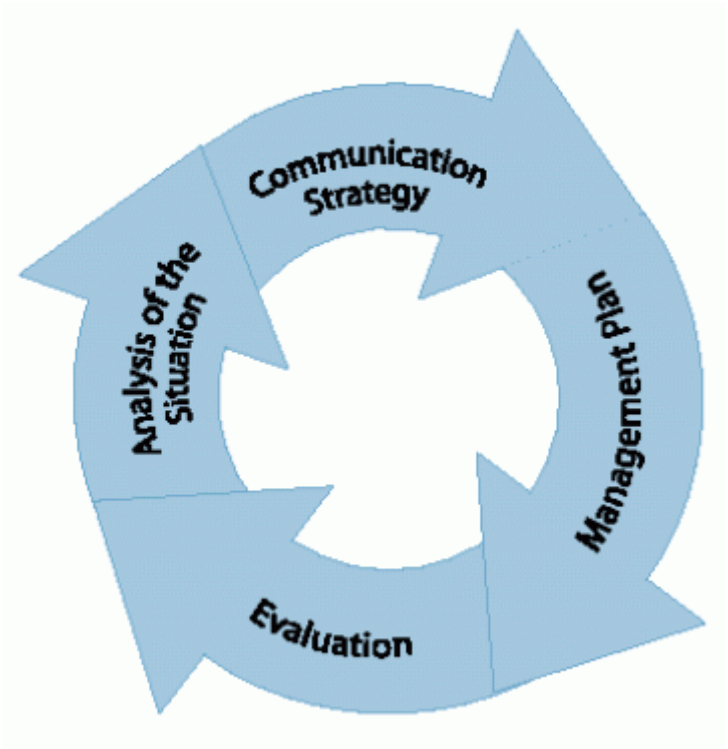
The process for implementing the programme (see Figure 2) includes:

1. A detailed examination of the situation to identify critical health issues, which involves conducting a strengths, weaknesses, opportunities, and threats analysis of the context, identifying gaps in the information available, and conducting formative research.
2. Communication strategy, which focuses on identifying the audience, positioning the strategy, and establishing a long-term identity; developing a tactical approach for delivering the core elements or points of messages; and identifying communications tools and channels.
3. Management considerations, which include the responsibilities and roles of partners, timelines for implementing strategies, and budgetary and monetary planning.
4. Evaluation tracking in terms of progress and impact through monitoring and assessment.

Each stage is further divided into steps that include additional resources. For example, worksheets, tips, checklists, questions to ask oneself, essential notes, and case study examples of documentation. In summary, the field guide provides an exhaustive process for defining the role of the stakeholder, including the professionals who design the communication medium, and focuses on how to design a strategy to build and implement an intervention as well as what the content of the intervention should be.

Figure 2

Field Guide for Designing Health Communication Strategies



Note. From *A Field Guide to Designing a Health Communication Strategy* (p. 2), by G.A. O'Sullivan, J.A. Yonkler, W. Morgan, and A.P. Merritt, 2003, Johns Hopkins Bloomberg School of Public Health, Center for Communication Programs (https://pdf.usaid.gov/pdf_docs/Pnacu553.pdf). In the public domain.

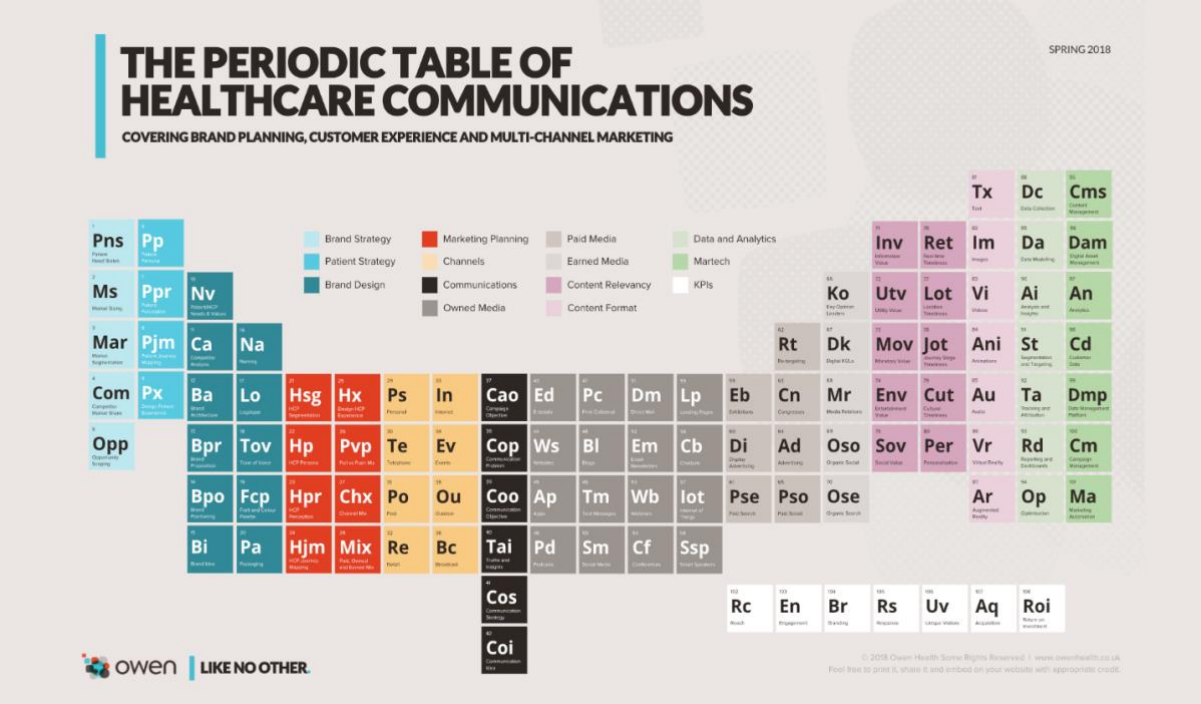
1.3.3 The Periodic Table of Healthcare Communications

The Periodic Table of Healthcare Communications (2018; see Figure 3), is a commercially known and popularly accepted framework for brand planning to integrate marketing activities. This definitive framework facilitates the building of healthcare communication strategies for brand planning, customer experiences, and multi-channel marketing by different agencies that deal with health communication. It was created by Owen Health, a health communication agency, for pharmaceutical multi-channel marketing, and it is now used extensively by healthcare firms. The Periodic Table of Healthcare is built such that any firm or organisation can customise it to design strategies that cater to their organisational needs. It covers three areas:

1. Brand planning and multi-channel marketing, wherein the brand activities catering to markets, patients, and competitors are prioritised while the marketing planning scenarios are set. This subsequently informs the brand planning decisions taken in multi-channel communication campaigns.
2. Customer experience in healthcare communications, which focuses on understanding and positioning the customer experience in health communication. It begins with understanding the journey map of the customer and healthcare professional and then further mapping the journey to facilitate designing a new journey map.
3. Healthcare communication propositions, which focus on keeping the brand proposition and communication proposition separate in order that they can be integrated without influencing or affecting each other.

Figure 3

The Periodic Table of Healthcare Communications



Note. From *The Periodic Table of Healthcare Communications*, by Owen Health, 2018 (https://www.weareowenhealth.com/the-periodic-table-of-healthcare-communication). In the public domain.

The communication frameworks discussed in this section cater to different aspects of health communication. While the WHO framework defines the roles and responsibilities of stakeholders, O'Sullivan et al.'s (2003) framework focuses on the overall implementation plan of the intervention, and Owen Health's Periodic Table of Healthcare Communication details the branding strategies that can be customised as per the needs of the firm or organisation that is implementing a particular programme. While each framework touches upon how to design a strategy for implementing and executing an intervention, none focuses on the what and why of communication design. Thus, these frameworks are more from a management perspective and do not consider underlying yet significant psychological variables that can influence any intervention and lead to behaviour change.

1.4 Complexities in Designing Health Communication

Designing healthcare communication for a multicultural, diverse population is a complex endeavour, as it requires addressing issues pertaining to geographical diversity, infrastructure, technological limitations, and language barriers, all of which can affect the success of an intervention. Other issues, such as sociodemographic, cognitive, and psychosocial factors, can make designing an effective health communication model challenging (Biswas, 2023; van Hoof et al., 2014). The following section highlights and discusses some of these pertinent issues.

1.4.1 Infrastructure

Most health communication interventions are technology-based and implemented by government and non-governmental agencies in remote locations. Managing the ecosystem in a resource-limited setting with multiple stakeholders becomes a challenge. Public hospitals in most parts of India have limited resources and lack essential infrastructural support. In particular, because of the lack of human resources and few trained workers to handle complex systems, health workers tend to be overworked with multiple tasks such as enrolling, registering, training, and troubleshooting (Joshi et al., 2014). The lack of infrastructure significantly hinders the successful implementation of any intervention.

1.4.2 Technology

A lack of technological skills limits field staff and health workers. Although technology can take the lead by supporting the management and maintenance of processes, it becomes a

roadblock in certain situations. This occurs when untrained health workers lack the skills to effectively utilise advanced technology, resulting in incorrect data entry and flawed implementation (Biswas, 2023).

Whether users accept features such as pill reminders is contingent on individual preferences. Evidence suggests that habit formation may lead to underusing a specific feature. On the contrary, there are likely to be others who might become more dependent on technology. Therefore, support must be identified and provided in specific instances where it is needed. Significantly, the well-being of dependents serves as a motivating factor for behaviour change. Moreover, mobile technology proves valuable in preserving privacy, particularly in contexts where information on sensitive issues—such as sex education—is needed, necessitating the use of discreet messages (Joshi et al., 2019).

1.4.3 Top-Down Approach

The discourse referring to 'behavioural interventions' predominantly adopts an approach that is paternalistic and top-down. That is, an imposition of thoughts, where the emphasis is on preaching advice rather than behaviour change and building a consciousness of general health and well-being. With the emergence of technology resulting in the option of choice autonomy, most health communication thus far tends to impose content on individuals rather than inform them with their consent. Although individual responsibility for health outcomes has intensified in healthcare and public health (WHO, 2010), most health promotion interventions are not chosen by their target populations. Instead, they are identified for the target populations by the agencies who provide them (Dennison et al., 2013). Thus, there is a need to re-examine interventions and their design in order to sensitise people towards health behaviours in a manner where individuals bear the onus of decision making through changes in attitude and belief.

1.4.4 Sociocultural and Demographic Factors

Sociocultural and demographic diversity significantly influences healthcare systems, as people from various cultural and demographic settings have vastly different perceptions of illness, health, and healthcare. Such diversity acts as a hidden or less apparent determinant that is more powerful than it appears to be. However, in most cases, behavioural scientists work more on psychological variables and less on sociodemographic variables. Despite several government initiatives, countries with rich cultural and sociodemographic diversity—such as

India—face challenges in providing equal access to health delivery. In such situations, designing section- or community-specific interventions that can overcome disparities becomes challenging (Ashing-Giwa, 2008).

In India, the socioeconomic status across regions is not uniform. Beyond its linguistic diversity, the country has regional variations in culture, wherein what is deemed acceptable to one group or community may not align with the norms of another. Furthermore, a gender divide persists, even when determining which information will be disseminated to whom. Women face restrictions in receiving specific messages and information from stakeholders, and their sociodemographic factors affect the level of exposure to new technology and the availability of resources. These issues become a roadblock for localising and scaling any health communication programme (Biswas, 2023; Joshi et al., 2019).

1.4.5 Psychological Dimensions of Learning

Behaviour change mechanisms are affected by psychological factors such as motivation and trust. While conditions such as safe parenthood and well-being motivate people to adapt to modern technology, the reliability of the information source is a critical determinant for adapting to technology. There is little evidence of the efficacy of health communication programmes for future health issues. Current health communication interventions are designed to cater to present needs and do not cover the perception of future health risks (Renfree et al., 2016). The theories of nudge, motivation, and risk perception have played an essential role in health communication design. However, more research is needed to integrate them and develop a holistic model. Health psychology emphasises the relevance of a multilevel framework that considers biological determinants and the social context of health-related experiences, highlighting how various factors can influence change mechanisms. Measuring such influences in highly diverse settings is a challenging endeavour (Biswas, 2023).

1.5 COVID-19

COVID-19, an infectious disease, has emerged as a significant threat to human health. The sudden and unpredictable nature of this pandemic has heightened the awareness of both health consumers and policymakers regarding the critical role of preventive health communication. This has led to a surge in demand for digital health messaging (Dé et al., 2020; Motta Zanin et al., 2020). Despite the evolving nature of the risks posed by SARS-CoV-2 throughout the pandemic, the extensive media coverage, including that on social media

platforms, has shaped people's perceptions of risk (Dryhurst et al., 2020). The uncertainty during the COVID-19 pandemic prompted individuals to become more mindful of their actions, reaffirming the link between risk perception and the urgency of behaviour change (Cori et al., 2020). Consequently, this heightened awareness has resulted in the rapid adoption of digital health communication, with health consumers exhibiting greater receptivity to implementing preventive health measures (Golinelli et al., 2020).

Furthermore, constructive fear has been pivotal in promoting health behaviour change (Maddux & Rogers, 1983). The desire to maintain health and safety has become the driving force behind behavioural shifts. Individuals took proactive steps to enhance self-reliance by enhancing their self-awareness to the best of their knowledge (de Bruin & Bennett, 2020). Moreover, the lockdowns compelled people to recognise the significance of technology in seeking health information, thereby highlighting effective and ineffective modes of communication for disseminating health-related information (Gerhold, 2020; Wise et al., 2020).

However, the permanence of the resulting behaviour changes is uncertain because a particular situation prevailed; therefore, the change was evident. Additionally, with the availability of vaccines and the new variants of the SARS-CoV-2, adherence to established norms and protocols witnessed fluctuations. Hence, although there is substantial evidence of technology acceptance, the effectiveness of health communication remains influenced by individuals' perceived risk perception. No studies demonstrate that the behaviour change has been consistent and has long-term effects (Kalhori et al., 2021; Scott et al., 2020; Sust et al., 2020).

1.6 Risk Perception and Risk Communication

From the public health perspective, risk perception and risk communication are multifaceted concepts that people need to be aware of. Health risk perception and risk communication are linked with individuals' attitudes and behaviours; that is, individuals must perceive a personal sense of risk or vulnerability. Thus, reducing risk behaviours becomes integral to any health intervention (Schmälzle et al., 2017).

Risk perception can be evaluated across two dimensions: dread risk, which focuses on individuals' perceived control over risk exposure and varies based on the harmful consequences and ramifications of the risk, and unknown risk, which focuses on the predictability, observability, and comprehensibility of the risk. This shows that attitudes and

perceptions have influences beyond a probability-severity risk matrix (G. Loewenstein et al., 2015; G. F. Loewenstein et al., 2001). Another type of risk perception is rooted in intuition or analytic or deliberative feelings (Schmälzle et al., 2017).

The risk perception attitude framework proposed by Turner et al. (2006) offers a theoretical perspective for categorising audiences according to their risk perceptions and personal efficacy beliefs. The framework includes four categories. Group 1 includes individuals with weak efficacy beliefs and low risk perceptions who may be described as holding attitudes of 'indifference' and lacking the motivation to act. These individuals do not believe they have control over taking action, consequently possessing an indifferent attitude towards protective behaviours. Group 2 includes individuals with strong efficacy beliefs, high risk perceptions, and responsive attitudes. Such individuals have high risk perceptions that motivate them to act, which facilitates strong efficacy beliefs, and they extensively engage in self-protective behaviours. Group 3 includes people with weak efficacy beliefs and low risk perceptions who may be described as having proactive attitudes and confidence in their abilities. They generally do not adopt self-protective behaviours because their risk perceptions are insufficient for motivating change. Group 4 includes individuals with weak efficacy beliefs, high risk perceptions, and avoidance attitudes. For such individuals, on the one hand, their high risk perceptions motivate action, but on the other hand, their weak efficacy beliefs prevent engagement in the relevant or necessary behaviours (Rimal et al., 2009).

Improving risk communication hinges on comprehending how individuals perceive risk and using that to strategise communication activities, which differ in their scope over a spectrum that ranges between influencing and informing (Fischhoff et al., 2012; Rice & Atkin, 2001; Schmälzle et al., 2017). In terms of information, health risk communication can increase public awareness of health risks in one's life and environment, and in terms of influence, health and risk communication should aim to heighten risk perceptions to encourage preventive and protective behaviours (Wakefield et al., 2010). While numerous factors contribute to the effectiveness of health messages in mass media, a fundamental element of successful campaigns is the ability to address and engage recipients in a manner that is motivationally relevant and personal (Schmälzle et al., 2017).

1.7 Redefining Health Communication

Health communication researchers recognise the importance of communication and related issues, and research is constantly being conducted to suggest improvements. While

attending to communication-related complications may not resolve all the issues, doing so is vital for increasing health-promoting behaviours and practices.

Health communication is a multidimensional domain that converges multiple fields to offer a holistic approach. It is constantly evolving, and researchers continue refining earlier theories and developing new ones at every stage of the health communication process. Many prominent theories used in health communication originate in communication principles, social psychology, and anthropology, with a significant focus on understanding behaviour change mechanisms.

Over the last two decades, health consumers have evolved from passive recipients to active health-seeking co-owners of their health and wellness decisions. After the COVID-19 pandemic, people have become conscious of their right to good health and well-being and prefer to have choices and preferences regarding the messages they want to hear (Ciasullo et al., 2022). However, overexposure to media and excessive quantities of information can lead to information overload and misinformation because individuals cannot differentiate between relevant and non-relevant information. Perspectives are formed on popular practices and trends, occasionally leading to quick-fix solutions rather than critical evaluations of the future implications. There needs to be a process where inviduals' choices are validated, thereby making them active participants in curating the content. It is also important that communication be two-way. Thus, there is a need to re-examine existing intervention paradigms and design interventions to sensitise individuals towards their well-being—doing so would make individuals self-reliant and self-responsible.

In situations where procedural factors related to self-management can be addressed using extant frameworks, the intervention design has incorporated psychological concepts, such as motivation and nudge, and elements of gamification to guide individuals to self-management. Health communication research on attitude formation and behaviour change is nascent, and how various factors affect health speculation through risk perception is poorly understood. People from different age groups perceive risk differently, and differences in approach exist according to individuals' attitudes, perceptions, and cultural influences.

Campaigns use various communication strategies to influence the behaviour of target populations. These strategies encompass efforts to modify the economic and political environments surrounding decision making, direct interventions for the target populations, and initiatives targeting individuals who might hold sway over the target population. The chosen strategy or strategies are selected after analysing individual decision-making contexts. The

existing health communication models view the general population with the assumption that everyone receives and perceives messages in the same manner. Further, there are few opportunities to customise health communication at an individual level. The inclusion of technology has enabled coverage, and features such as gamification increase motivation. Moreover, although learning models facilitate behaviour change, it is not permanent or the result of increased self-awareness and self-regulation.

1.8 Conceptual Framework for the Study

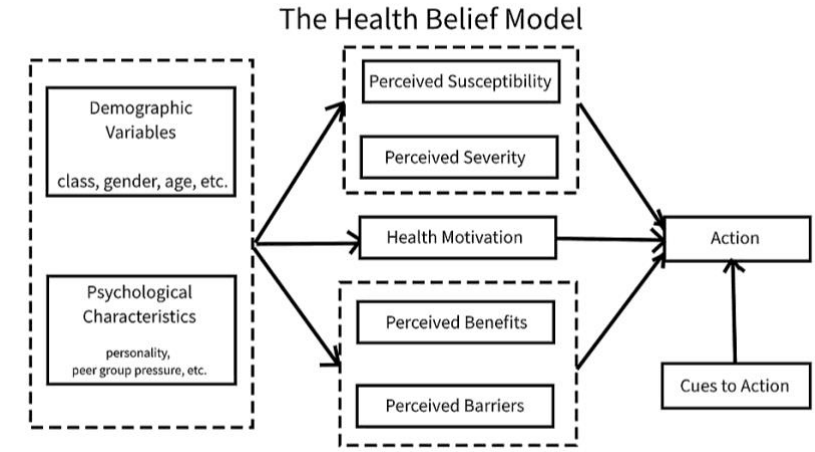
The conceptual framework proposed in this research is underpinned by the health belief model (Rosenstock, 2004) and Bronfenbrenner's ecological systems theory (1979). The health belief model (see Figure 4) considers individuals' perceptions and convictions concerning health and health-related conditions, which in turn predict their health-related behaviours. It also describes the critical factors influencing health behaviours, which revolve around individuals' perception of the risk of illness or disease. These factors include self-efficacy, cues to action, perceived severity, perceived benefits, and perceived susceptibility (Rosenstock, 2004).

In 1979, Bronfenbrenner proposed the ecological systems theory (see Figure 5), which explains the influence of social environments on human development and how environmental changes lead to behavioural changes (Härkönen, 2007). The five systems include the microsystem, mesosystem, exosystem, macrosystem, and chronosystem. In this research, the focus is on female adolescents, who navigate through various experiences in their life in terms of physiological health and social changes, and these two models discussed above form the premise of the proposed conceptual framework (see Figure 6).

The proposed conceptual framework details how behaviour change mechanisms work, highlighting the variables that lead to the change. Individuals navigate through a trajectory that begins with information seeking and ends with the maintenance of self-goals. Here, information is defined as the set of information that is needed to complete a specific goal. It also refers to behaviours such as ascertaining the information needed, selecting and evaluating information sources, and using the information. **Information seeking** is a process in which humans change their state of knowledge by acquiring or building knowledge. This form of constructivism entails a communal inquiry into a particular subject, which leads to deeper understanding.

Figure 4

The Health Belief Model



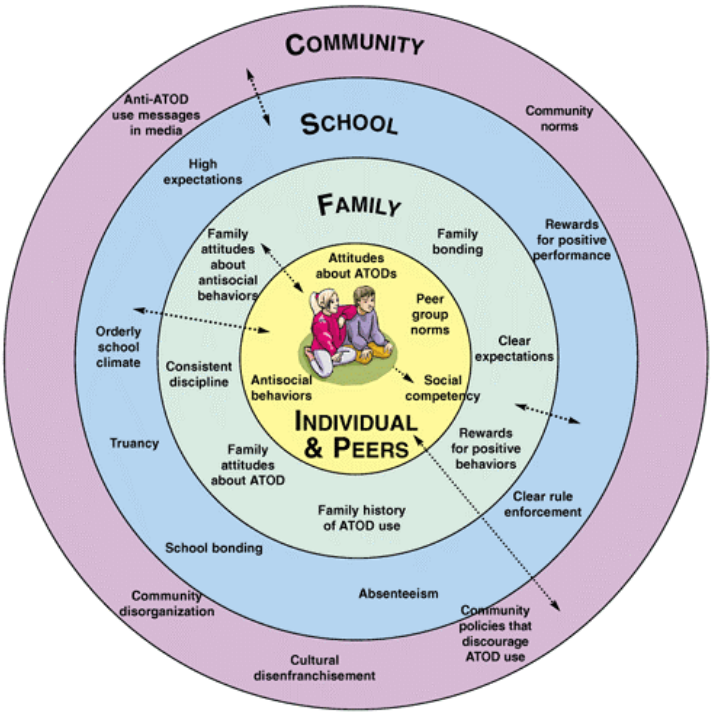
Note. From Health Belief Model, by Wikipedia, n.d. (https://en.wikipedia.org/wiki/Health_belief_model). In the public domain.

Such an inquiry may be conducted through interactive questioning, dialogue, and ongoing improvement ideas. Similarlly, **knowledge building** is a conscious and intentional action that constructs knowledge based on exposure to various sources. While information seeking and knowledge building are the two variables leading to behaviour change that have been identified, their functioning largely depends on two dependent variables: **influences** and **attitudes**. Positive and negative factors influence an individual's information seeking, and the underlying variables that influence these factors include the sociodemographic setting, environment, and exposure to knowledge and information sources. Positive influences, in all probability, positively impact one's life. However, even negative influences can lead to information seeking and knowledge building in specific scenarios. How individuals interact with various factors depends on their attentional attitudes, which could result in passive or active attention. While individuals with passive attention would remain indifferent towards any information leading to behaviour change, individuals with passive attention would be impacted by their lived experience. Further, individuals attend to topics related to their adverse experiences, and those with active attention would attempt to be armed with health-related

information. The combination of influences and attitudes would lead an individual towards information seeking and, subsequently, knowledge building. To build a communication model, it is important to identify and understand this dynamic interplay between the variables and design strategies that can effectively address issues.

Figure 5

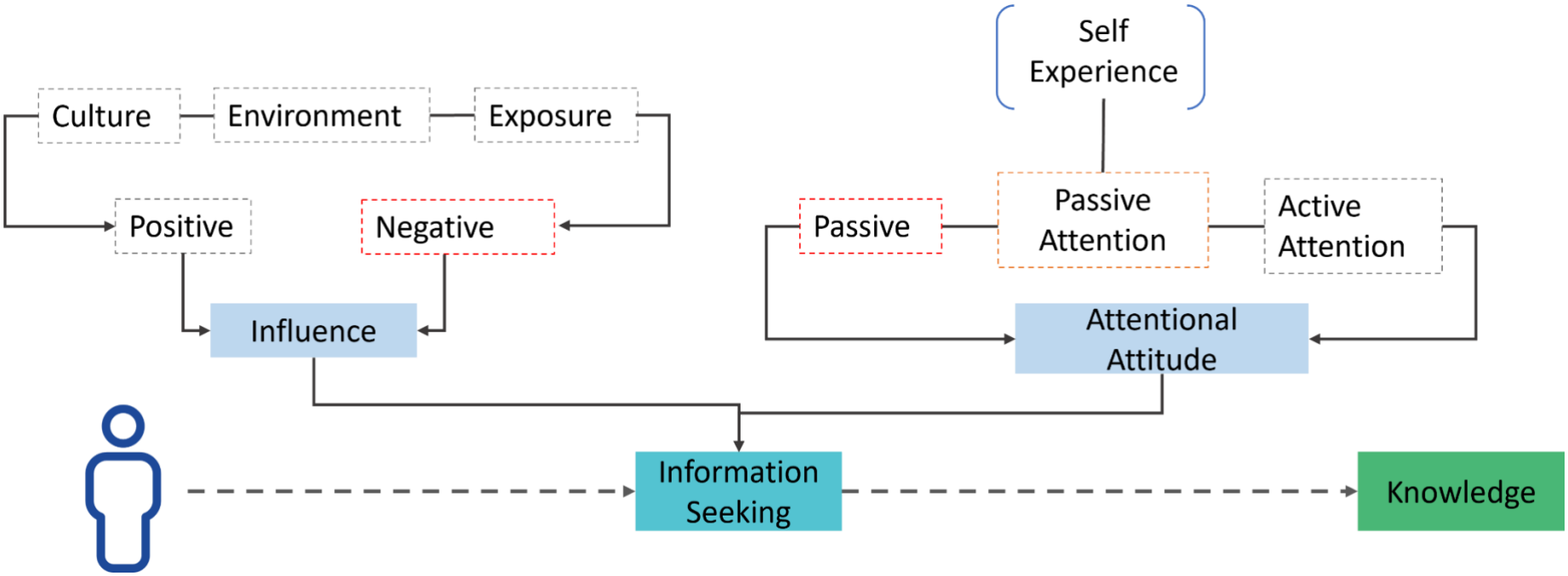
Bronfenbrenner's Ecological Systems Theory



Note. From *Ecological Model*, by K. Alyla. Retrieved from Wikimedia Commons (https://commons.wikimedia.org/wiki/File:Ecological_Model.gif). CC BY-SA 4.0.

Figure 6

Proposed Conceptual Framework of the Research



1.9 Overview of the Chapters

A summary of each chapter of the thesis follows:

- **Chapter 1 – Introduction**: This chapter discusses the significance of the research in the context of health communication for public health. It further discusses the gaps in three prevalently used health communication frameworks, highlighting the need to redefine the perception of health communication. The later section of the chapter discusses the complexities that arise while designing health communication in the Indian context. The chapter concludes by proposing a conceptual framework that forms the premise of the overall research study.

- **Chapter 2 – Review of the Literature**: This chapter provides an overview of the significance of the research and details the key constructs of the study: social communication and adolescent reproductive health and well-being. It further highlights the significance of social communication in the current healthcare scenario and identifies the relevance of adolescents in the context of this research. The latter section details the research gaps in the literature and the research rationale.

- **Chapter 3 - Research Objectives, Design, and Structure**: This chapter deals with the research methodology, including the sample, data collection, and analysis procedures, for the two phases of this research. In Phase 1, concurrent mixed methods were applied to conduct a qualitative and a quantitative study to understand reproductive health and well-being among women of different ages. For the qualitative study, semi-structured interviews were conducted with 30 women; for the quantitative study, survey data were collected from 736 participants. Phase 2 involved developing a social communication framework, building a social communication toolkit using experience-based co-design (EBCD), and validating the toolkit through expert review.

- **Chapter 4 – Comprehension of Reproductive Health and Well-Being Among Women: A Qualitative Study**: This chapter presents the results of a qualitative study conducted to better understand the underlying factors that influence knowledge-building and information-seeking behaviours regarding reproductive health and well-being. The results of the interviews of 30 women from different age groups are presented, along with the identification of themes that emerged from the data. The aim of the qualitative study was to identify information regarding reproductive health and well-being retained since adolescence among women at all stages of life. The chapter also highlights the effects of sociodemographic influences and psychosocial factors that restrict knowledge building and information seeking among women.

- **Chapter 5 – Knowledge-Building and Information-Seeking Behaviour Regarding Reproductive Health and Well-Being Among Women – A Quantitative Study**: This chapter presents the objective, methods, results, and findings of the quantitative study, which was conducted with 736 participants to understand knowledge and information-seeking behaviours regarding reproductive health and well-being among women of different ages.

- **Chapter 6 – Development of a Social Communication Framework for Health Behaviour Change**: This chapter converges the results of the qualitative and quantitative studies using the triangulation method. Further, it integrates the study findings with psychological theories and concepts to develop a social communication framework for health behaviour change. This process includes identifying the gaps pertaining to reproductive health and their implications on the overall well-being of women, highlighting the need to psychoeducate adolescents for their future health and well-being.

- **Chapter 7 – An Expert-Validated Social Communication Toolkit**: This chapter discusses the process of identifying the components for a gamified social communication toolkit based on the framework proposed Chapter 6. The toolkit's components were derived from a series of workshops based on EBCD. As the objective of the toolkit was to facilitate health behaviour change towards

reproductive health and well-being among female adolescents, the workshop was conducted with young adults, who have progressed from adolescence to adulthood. The chapter highlights the relevance of EBCD for building the toolkit, elucidates the process of using EBCD to build the toolkit, and present the results of the expert interviews conducted to validate the framework and the toolkit components.

- **Chapter 8 – Discussion**: This chapter synthesises the qualitative and quantitative findings of this research, guiding the reader through the studies conducted to construct the social communication framework. It details the mapping of the framework with the toolkit and discusses the nuances that were identified to build the proposed social communication model. It concludes by summarising the results of each study to bring closure to the proposed conceptual model and build a holistic understanding of the research.

- **Chapter 9** – **Summary and Conclusion**: This chapter includes the major findings of the research, followed by a discussion of the implications of the research, limitations, and recommendations for future work.