2022

Typhoid Fever Among Low-Income women living in Gujranwala, Pakistan.

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This is to certify that the doctoral dissertation by

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2022

Abstract

Typhoid Fever Among Low-income Women Living in Gujranwala, Pakistan

by

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

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November 16, 2022

Abstract

Approximately 21 million individuals suffer from typhoid fever (TF) globally, and most outbreaks occur in Southeast Asia. The incidence of TF is high in Pakistan, particularly in low socioeconomic areas, and a new drug-resistant strain makes it difficult to control the spread of TF. There is a pressing need for up-to-date and accurate data regarding the attitudes, beliefs, and habits leading to the spread of TF infection among individuals living in low socioeconomic areas of Pakistan. This qualitative, phenomenological study was grounded in the health belief model and explored factors that influence the spread of TF among women of childbearing age in Gujranwala, Pakistan. Women of child-bearing age are essential to study because they are usually neglected, and other family members control their treatment. Semistructured interviews were conducted with 10 women, aged 18 to 45 years, via telephone. Responses were transcribed and translated to English and analyzed according to Creswell's qualitative data analysis methods. Eight themes were revealed by the data: ignorance and mistrust, local practices, faith in biomedicine, obstacles to treatment and medical services, environmental barriers, life constraints, perception of risk, and gender issues. Most participants experienced multiple episodes of TF and prolonged sickness, relied on home remedies instead of visiting the government hospital, had limited knowledge of symptoms, prevention practices and treatment for TF, and reported lack of access to clean, filtered water. Findings from this study can impact social change by identifying factors that influence the spread of TF in targeted areas and informing potential TF education and awareness campaigns for low socioeconomic areas of Pakistan.

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Dedication

I dedicate this writing to my parents, my husband, and my three children who helped me learn and achieve my goals in life.

Acknowledgments

I sincerely thank my chair Dr. Aimee Ferraro, who helped me and guided me through my dissertation. I also thank my immediate family (husband and children), who stood by me during the dissertation writing process.

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Chapter 1: Introduction to the Study

Introduction

Typhoid fever (TF) is a critical health issue among individuals living in low socioeconomic areas, especially in developing countries (Saleem & Hassali, 2019). *Salmonella typhimurium* (*S. typhi)* causes TF and humans are the only reservoir for this bacterium, infecting individuals through contaminated water and sewage systems (Kabwama et al., 2017). *S. typhi* flourishes in hot, humid climates and unhygienic environments (Chatham-Stephens et al., 2019). Ingestion of *S. typhi* contaminated food/beverages or drinks, and poor sanitation/hygiene is the cause of TF spread It is a typical community health problem in low socioeconomic areas. There is a need to pay close attention to community health in perspective of containing infectious diseases like TF and directing funds for clean drinking water and sanitation in high-risk areas.

Individuals suffering from TF face consequences of morbidity and mortality (Bulage et al., 2017). Lack of funds, direction, and interest from local governments often leads to the neglect of this issue in low socioeconomic areas. These areas lack proper sanitation and hygiene facilities, and the standard of living is below average; many times, there is no proper sewage system or toilet system in the area (Patrick et al., 2021). This can result in sewage water getting mixed with drinking or household water. According to Saeed et al. (2020), ingestion of contaminated *S. typhi* food also causes the spread of TF within a community. The fecal-oral route is the main culprit for transmission of infection, as human feces contain *S. typhi*, and usually, *S. typhi* contaminated water is the prime source of infection (Saeed et al., 2020). Individuals, especially low-educated women

living in these low socioeconomic areas, are unaware that an unhygienic environment affects their sanitation, health, and lifestyle (Rizvi et al., 2014).

Gujranwala is a marshy city in Punjab province of Pakistan. Locals work on farms, and the small, home-based industry is the livelihood of 45–49% of the individuals living in low socioeconomic areas (Mushtaq et al., 2011). Due to the individuals' low education and cultural practices, this population usually relieve themselves in the open fields where they work (Ssekamatte et al., 2019). Private toilets are the key to sanitation, and controlling fecal-oral diseases (Ssekamatte et al., 2019). Hence, investment in public toilets is a critical need. The average male-to-female ratio for TF in Gujranwala, Pakistan, is 1:1.3 (Mushtaq et al., 2011). Gujranwala city has a total population of more than 20 million individuals and is an industrial area located northeast of Punjab in Pakistan (Naz et al., 2017). Out of the total 5,014,196 population of district Gujranwala, Pakistan, 2,480,828 are women, and out of this, only 1,030,581 women live in rural areas of Gujranwala (Population of Pakistan Census, 2020). In this targeted area of Gujranwala, 37–41% of its population suffers from TF (Mehboob et al., 2013). The incidence of TF in Pakistan is 451.7 cases per 100,000 individuals per year (Rasul et al., 2017).

Globally, the incidence of TF is between 12 to 27 million cases annually (Chatham-Stephens et al., 2019). Approximately 128,000 to 161,000 deaths occur annually due to TF (Date et al., 2014). In Asia, 216,500 deaths occur due to TF annually (Date et al., 2014). Developing countries' governments often neglect low socioeconomic areas, and infectious diseases spread from these areas. Despite the international donor agencies, local donor agencies, and local government authorities, allocating resources to

curtail the disease in low socioeconomic areas, the disease is spreading. These funds seem to be insufficient to do the needful work towards disease control (Janjua, 2018). Another reason for the spread of TF is that some TF patients travel worldwide without medications or vaccination (Anwar et al., 2014). Barac et al. (2018) indicated that investing in public education plus clean water, and clean environment would help control of TF in high-risk areas. Hence, there is a dire need for innovative programs, policies, and interventions to control typhoid epidemics and outbreaks (Barac et al., 2018). Even though typhoid monitoring and medications are available, the scientific literature does not explain the attitudes, beliefs, culture, and habits that put vulnerable populations at greater risk for TF infection.

Moreover, Pakistan is one of the gender-suppressed societies as far as women are concerned (Rizvi et al., 2014). The typical culture neglects women, and because of this, they cannot raise their voices even when they are sick and need medical attention (Rizvi et al., 2014). It is vital to listen to women in societies to reach the root cause of some health issues in a community. Jabeen et al. (2020) explained that women of childbearing age are important as the rate of childbirth in Pakistan is one of the greatest in the world. If these women die of TF complications, there is no one to take care of the children left behind. Prompt attention and interventions can address their needs. This chapter will include more details about the background of this study and the problem statement, the purpose of the study, its research questions, the nature of the study, and other critical elements such as its assumptions, scope and delimitations, limitations, and significance.

Background

TF is a disease found in low socioeconomic areas, and the outbreak of drug-resistant TF bacteria has made it worse in Pakistan (Janjua, 2018). The organism *Salmonella enterica serovar typhi* and *S. paratyphi A are* the main causes of typhoid or enteric fever in humans (Mukhopadhyay et al., 2019). TF is transmitted from individual to individual due to fecal contaminated food and water. *S. enterica serovar typhi* is exclusive to humans; therefore, domestic use of sewage-contaminated water can spread the disease (Mogasale et al., 2016). Humans are the only reservoir, and flies, which are abundant in Pakistan, also spread TF via fecal-oral route infection (Mukhopadhyay et al., 2019). Water and food quality in the endemic area also plays a significant role in infecting individuals with TF (Watkins et al., 2020).

Moreover, TF causes gastrointestinal diseases, the severity of which depends upon the virulence of the organism and the immunity of the infected human (Mukhopadhyay et al., 2019). The environment and hygiene play an important role in the frequency of TF in low socioeconomic areas of Pakistan (Rasul et al., 2017). TF transmission usually peaks in the summer and early fall season in a high-risk area; probable reasons include collecting rainwater from reservoirs, an unsanitary environment, and insufficient sewer systems (Phillips et al., 2020). In developed countries, investments in clean water supply, improved sewage systems, and high sanitation standards have decreased TF spread (Phillips et al., 2020).

According to Mukhopadhyay et al. (2019) improved sanitation systems and hygiene are the two main approaches to reducing TF disease burden, in addition to

prevention and control measures using medications. Nonetheless, it is unclear how good (or bad) sanitation and hygiene practices are in low socioeconomic areas of Pakistan. In addition, cultural differences and gender disparities may impact decision-making and the ability of women to practice safe hygiene. It is imperative to understand the attitudes, beliefs, cultural barriers, and decision-making of women of childbearing age in Gujranwala, Pakistan to identify potential interventions that can prevent the spread of TF.

Problem Statement

Approximately 21.5 million individuals suffer from TF globally (Centers for Disease Control and Prevention [CDC], 2016). Outbreaks reoccur in low socioeconomic areas, specifically in South/Southeast Asia, the Western Pacific area, and sub-Saharan Africa (CDC, 2016; Date et al., 2014, 2018). TF incidence is still high in Pakistan and India compared to other countries in Asia (Ochiai et al., 2008). The increasing rate of TF in Pakistan is alarming and about 41% of the population in Gujranwala, Pakistan suffers from TF disease (Mehboob et al., 2013). Several regions in the Punjab province of Pakistan now show evidence of resistant TF bacteria strains, causing typhoid outbreaks, complications, and death, particularly in the low economic areas (Janjua, 2018).

A new strain of TF called the “superbug” is becoming prevalent in Pakistan. Pakistan reported 5,372 multiple drug-resistant typhoid bacteria cases from 2016 to 2018 due to TF outbreaks (Chatham et al., 2019). Aziz (2019) contended that the superbug is due to too much antibiotic use, the ingestion of unclean and contaminated water, and consumption of contaminated street food. There is a dire need to pinpoint the current causes for the spread of the disease, keeping in mind the attitudes towards TF of

individuals living in targeted areas. There are several unhygienic practices and habits that are known to increase spread of TF, including not washing hands after using toilet or before eating food, failing to cover cooked food to avoid contact with flies, drinking from the same glass or sharing a food plate with someone who has TF, and using open latrines with no sewage system (Im et. al., 2021, 2022). However, according to Bartholomew et al. (2011), data collected from low socioeconomic areas are not accurate or up to date, and there is a need for more evidence-based data. There is a lack of population-based data in low socioeconomic areas of Pakistan, just like in areas of Eastern, Central, and Western Africa, where there is spread of TF despite the availability of medicines (Radhakrishnan et al., 2018).

Purpose of the Study

This study focused on the participant's attitudes, beliefs, behavior, and their different approaches toward TF disease, sanitation, and hygiene practices that individuals follow to prevent TF infection. Phillips et al. (2020) indicated that individuals who live in low socioeconomic areas have low levels of education and are less aware of the spread of the disease and its long-term side effects. In addition, there are medications and vaccinations to control TF, and health officials in high-risk areas must provide these to the public with proper counseling and advice (Anwar et al., 2014; Date et al., 2014). Therefore, increasing awareness, education, and treatment is essential to combating TF disease.

Many TF patients try to control symptoms of the disease (i.e., malaise, fever, and diarrhea) with the use of probiotics (Huertas-Ceballos et al., 2014). Other studies show

that some use herbal medicines as the first line of treatment for diarrhea or irritable bowel syndrome (Liu, 2011; Liu et al., 2006). Individuals commonly use homeopathic medication and tricyclic antidepressants/selective serotonin reuptake inhibitors (TCA/SSRI) to treat symptoms of gastrointestinal ailments, and sometimes they are effective (Peckham et al., 2019; Ruepert et al., 2011). Education and awareness of good hygiene are critical in controlling the spread of TF, and third-generation cephalosporin and conjugate vaccination (when required) are still considered effective managements against it (Stoesser, 2013). Individuals should know that often in developing countries, food and beverages from street vendors are contaminated with typhoid bacteria (Kabwama et al., 2017). It is essential to guide individuals living in low socioeconomic areas of Gujranwala, Pakistan with all preventive measures to control the spread of TF disease, because they often think of TF as a self-limiting disease. Local and federal government officials must pay more attention and direct funds towards improving water quality, sewage systems, sanitation, and clean environment in high-risk areas (Phillips et al., 2020).

The primary purpose of this qualitative study was to understand the factors, through lived experiences, that influence the spread of TF among women of childbearing age in Gujranwala, Pakistan. According to Rizvi et al. (2014) women in Pakistan face vast gender inequalities and gender bias. Hence, they often suffer neglect and face the consequences from TF in the form of miscarriages, anemia, lethargy, poor health, and sometimes becoming carriers for *S. typhi*. The incidence of TF is more prevalent in areas with poor sanitation, inadequate hygiene, poor water quality, and contaminated food, but

prompt diagnosis, vaccination, and treatment, along with improving environmental conditions, can decrease the incidence of TF in a community (Nga et al., 2018). In this research study, information was collected, regarding the attitudes, beliefs, awareness levels of women, and reasons why women face TF morbidity and mortality (see Jena et al., 2017). Educated women can make prompt timely decisions. Findings from this study will provide helpful knowledge to women about safe daily life practices to prevent, diagnose, and contain the spread of TF.

Research Questions

The research questions for this qualitative study were:

Research Question 1 (RQ1): What are the attitudes and beliefs regarding TF prevention and treatment among women of childbearing age in Gujranwala, Pakistan?

Research Question 2 (RQ2): What are the perceived cultural barriers related to TF prevention and treatment among women of childbearing age in Gujranwala, Pakistan?

Research Question 3 (RQ3): To what extent does the severity of TF impact the decision-making processes of women of childbearing age in Gujranwala, Pakistan?

Theoretical Framework of the Study

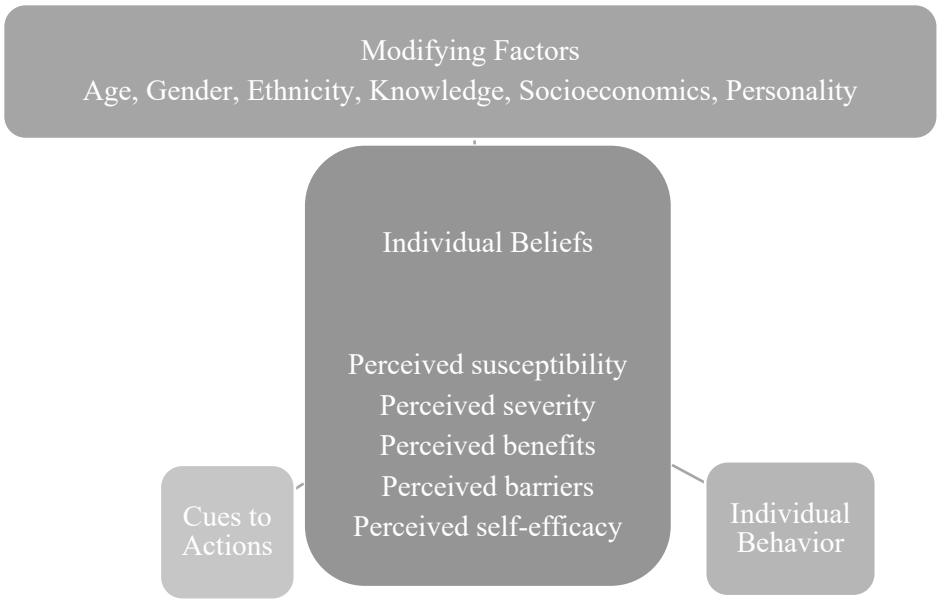
The theoretical framework for this study was the health belief model (HBM), a psychological model used to identify the intention of the individual (see Glanz et al., 2015; Hochbaum et al., 1952). According to Hochbaum et al. (1952), the HBM attempts to explain and predict health behaviors by focusing on the attitudes and beliefs of the individual. The HBM identifies the triggers (i.e., increase in knowledge of disease, hygiene, and vaccination) necessary for prompting engagement that promotes healthy

behaviors (washing hands, drinking clean, safe water, use of medication, and get medical help when sick) (Hochbaum et al., 1952). The HBM framework helped to analyze the intensity of cues needed to prompt actions that vary by the perceived susceptibility and barriers among low-income women (Stoesser, 2013). Regarding this study, the HBM has the potential to systematically explain and predict the health behaviors of women from a low-income region of Pakistan by focusing on their attitudes and beliefs.

According to the initial HBM (Rosenstock et al., 1998), health behaviors depend upon four health beliefs. Those beliefs are: (a) the perceived susceptibility of the risk of acquiring the disease, (b) the perceived severity of the disease, (c) the perceived benefits, and (d) risks of the prevention/treatment, and ultimately the perceived benefits of the prevention/treatment (Fall et al., 2018). The HBM given in Figure 1 shows how the adoption of healthy behaviors depends upon the perceptions of knowledge and experiences (Fall et al., 2018). According to Fall et al. (2018), self-efficacy and autonomous motivation greatly influence future intentions to act and carry out specific positive actions toward a healthy lifestyle. The theoretical framework provides guidance or direction for the study and underpins the connection among the various research constructs (Adom et al., 2018). Primary focus was on the connection between modifying factors, perceived severity, and behaviors related to TF prevention.

Figure 1

Health Belief Model



Note. Adapted from Glanz et al. (2008).

Nature of the Study

The nature of this study was qualitative. Qualitative methodology allows data collection on how individuals understand, think, and behave towards the disease (Rubin & Rubin, 2016). Qualitative data provided a clear picture of the participants' ideas and what is practically available for disease management in the targeted area. The qualitative research design focuses on the individual, wherein the participant described their lived experiences and decision-making process (Tight, 2016). Because these experiences were personal to the research participants, the phenomenological approach unraveled such experiences and provided an in-depth understanding of how attitudes and beliefs influence the risk for TF among women (see Lewis, 2015).

The use of phenomenology allowed for a deeper understanding of the situation from a broader perspective and the collected data from several sources uncovered the veiled emotions of participants (Hollweck, 2015; Miles et al., 2014). In Pakistan, due to the suppression of the female voice and broader gender inequalities, women of childbearing age are difficult to approach (Rizvi et al., 2014). Females were hard to interview in this specific area of Gujranwala, due to their norms and cultural factors, which required long hours of interaction with them to gain their trust and explore their genuine emotions, feelings, and ideas. Sometimes living in the research study area is ideal, but this was difficult due to COVID-19 pandemic. I lived in the vicinity of low socioeconomic areas of Gujranwala in my childhood. I also worked as a tertiary care government hospital physician and gynecologist, and treated many female patients from this area of Gujranwala, Pakistan, so my understanding of the community helped me gather unique information about this specific population.

Definitions

Epidemic: A widespread occurrence of an infectious disease in a community at a particular time (Oxford Dictionary, n.d.).

Hygiene: The practice of keeping oneself and the living and working areas clean to prevent illness or disease (Oxford Dictionary, n.d.)

Morbidity: The fact of having a particular disease, the number of individuals who have a particular disease (Oxford Dictionary, n.d.).

Mortality: The condition of being mortal or subjected to death (Oxford Dictionary, n.d.).

Mortality rate: The rate of death in a population. Mortality rate is a measure of the frequency of death in a defined population during a specified interval (CDC, 2021). The formula for mortality rate is deaths occurring during a given time (period)/size of the population among which the deaths occurred x 10n, in United States, values of 1,000 or 100,000 (most used for 10n) per year is used (CDC, 2021).

Outbreak: The sudden start of something unpleasant especially violence or disease (Oxford Dictionary, n.d.).

Salmonella typhi: The affected individual suffers from fever, nausea, vomiting, and diarrhea. In extreme cases, intestinal perforation can occur if the disease is not treated for a long time or if it is left untreated (Mukhopadhyay et al., 2019).

Treatment modalities: A particular way treatment is experienced or done (Oxford Dictionary, n.d.).

Typhoid fever: A bacterial infection of the gastrointestinal system caused by *Salmonella typhi.* The affected individual suffers from fever, nausea, vomiting, and diarrhea. In extreme cases, intestinal perforation could occur if the disease left untreated (Mukhopadhyay et al., 2019)

Vaccination: An act of injecting a vaccine into the human body or animal to protect against disease (Oxford Dictionary, n.d.).

Vaccine: A substance that is put into the blood to protect against a disease (i.e., measles; Oxford Dictionary, n.d.).

Assumptions

Researchers should always keep their assumptions of doing everything perfectly right when conducting research (Creswell, 2014). The primary method of this research study was to gather all the informative data via audio (only) recordings of women living in low socioeconomic areas to explain their lived experiences truthfully. The assumption was that the selected participants (10 women of childbearing age) had enough experience related to TF in their area. Another assumption was that questioning these experienced women will unfold the root cause of TF spread in low socioeconomic areas. The researcher's bias was that every interview went smooth, ensuring subject's privacy. Further, assumptions included consistency in the questioning, conducting, and administering of the research interviews (see Creswell, 2014). My personal bias, being a physician/gynecologist, was kept to a minimum by explaining my current role as a PhD student at Walden University, in the United States.

It was assumed that the information collected from this purposeful sampling of participants was sufficient and will provide honest, truthful, valid, and dependable data with knowledge based on each participant's experience. Also, it was assumed that the research study outcomes and results would reach the required goal of learning how these individuals deal with TF positively. Individuals can adopt effective measures to curtail and prevent TF from spreading when they were informed well about the required hope and goal of the research study.

Scope and Delimitations

This study was a qualitative phenomenological study and limited to women dwelling in low socioeconomic areas of Gujranwala, Pakistan. Only 10 women were enrolled, and no casual inferences were made. The reason for choosing women was to explore women's experiences, who managed their family's home lives, and their health issues were important. Usually, men living in low socioeconomic areas work outside the home (most of the day). This purposeful sampling of women provided rich information due to their experiences and observation of TF cases around them, and their own suffering from symptoms and long-term effects, as well as health interventions and treatments. This study provided these neglected women the opportunity to express themselves openly. Also, this study provided an opportunity for these women, living in low socioeconomic areas, to experience having their views taken seriously.

The phenomenological methodology and HBM framework helped to facilitate an understanding of women's attitudes and behaviors in these low-income areas (see Creswell, 2014). Men and women of higher socioeconomic status were not approached so that the focus was on a particular group of individuals. Interview questions revolved around TF lived experiences, feelings and reactions toward the disease, and attitudes or actions women thought were suitable if someone suffers from TF. Only the HBM theory was taken into consideration (see Fall et al., 2018). The data collected was limited to a specific group of individuals, and their demographics.

Limitations

This qualitative research study had many limitations. Interviews were conducted until saturation was reached, but findings were not applicable to the general population. Interviewer bias may have been introduced because the researcher is a female physician who can take a sympathetic attitude towards participants from these low socioeconomic areas. Triangulation strategies were used to minimize bias, such as including mentors and the dissertation chair in data coding and interpretation.

I spent my childhood in Pakistan, and after marriage lived in the city of Gujranwala and Lahore. I studied medicine in King Edward Medical College, Lahore, Pakistan. I did my postgraduate studies at Postgraduate Medical Institute, Lahore, Pakistan, and did my specialty (OBGYN) at the University of Health Sciences, Lahore, Pakistan. I also worked as a physician/surgeon and OBGYN in Pakistan. I have seen and observed many patients with TF and followed them for a long time (10-25 years). This educational and professional background gave me an advantage when conducting interviews, but it could also have made me a biased interviewer.

There was a potential bias regarding data collection through the telephone. Women face gender inequality in Pakistani culture (Ali et al., 2011). Participants may have been afraid to give all information on phone calls at home as someone else can listen to what they are saying. Sometimes, participants were afraid to answer the phone call, and hence there was a chance for an unrepresentative sample of the target population. To reduce bias due to study limitations, I worked with my dissertation chair to review interview transcripts and ensure saturation was reached. This helped maintain

dependability, transferability, and integrity of the research study's results (see Creswell, 2014).

Significance

The results from this research study will help medical and public health professionals understand the factors and experiences of women living in low socioeconomic areas of Pakistan that contribute to TF contraction and spread. The findings could help outline the programs and preventive steps to curtailing TF and eliminating such infectious diseases in the future. The results may become helpful to community and public health centers of Gujranwala in adopting healthy lifestyles, environment hygiene, and sanitation (Phillips et al., 2020). The findings will help community individuals living in low socioeconomic areas understand the health risks, the gravity of the risks, and how to prevent them. These research findings will help physicians, healthcare providers, and government officials at the local and federal level to understand the conditions of sick women in low socioeconomic areas. These stakeholders could implement community preventive measures to prevent the further spread of typhoid and future outbreaks of other infectious diseases (Kabwama et al., 2017).

Significance to Practice

The research findings may be helpful to health care practitioners and researchers. Health professionals can develop new strategies for tackling TF, such as TF education classes, just as hospitals have educational classes for diabetics and heart patients. The number of typhoid patients these health professionals tackle can be recorded and depicted on a graph and followed up to see the incidence of TF disease in a community. Results

may be beneficial for government leaders of Pakistan at various levels of authority and doctors in the health sector responsible for policymaking and implementation. This study may contribute to knowledge regarding TF spread in Southeast Asia and in the Western Pacific Region. Findings from this study could have potential implications for positive social change in women's lives in the Punjab state of Pakistan, as these women may experience a shift in paradigm in their understanding of TF and knowledge about how to avoid future infections.

Significance to Theory

The application of the HBM helps explain this study and is useful in helping individuals understand the facts about TF and how to change their behavior to prevent and treat the disease. The theory explains the principles and concepts depicting a phenomenon. This study focused on individual behaviors, beliefs, and factors influencing their attitudes and, finally, how these individuals will react to protect their health. It is important to understand the theory and link it with actions.

Significance to Social Change

The goal of this study was to impact positive social change and inform policies and programs for women in low socioeconomic areas of Gujranwala, Pakistan. This qualitative study can provide first-hand knowledge and evidence about problems experienced by one population at risk of TF in Gujranwala, Pakistan. It can help overcome the cultural and cognitive blocks prevalent in the population facing this health issue. Education and awareness regarding the factors causing TF can empower the community to improve hygiene and sanitation systems, provide clean, safe drinking

water, and introduce safe and effective waste systems (Kabwama et al., 2017). This study's findings will help individuals screen themselves and adopt effective vaccination and medication modalities (see Tilahun et al., 2017). The study's findings will also highlight the importance of constant monitoring, and strict supervision or surveillance for TF in these areas (see Date et al., 2014).

Summary

This study is vital so that effective interventions can be implemented to control and eradicate typhoid through a program of strict surveillance of the disease before it becomes endemic in affiliated city areas (Mogasale et al., 2016). Through the intervention of education that this study's findings promote, individuals in the target area can become aware that early detection and treatment can save lives and halt the future spread of typhoid (see Bulage et al., 2017). Women of childbearing age can make their own decisions to take steps toward a healthy lifestyle, as they are the ones experiencing the disease closely, and they also play a significant role in the house. The education intervention can help women avoid religious leaders, fraudulent medical practitioners (quacks), and herbal medicine practitioners (hakims), and pirs (spiritual guides) in seeking future advice on disease treatment. Instead, the local and federal governments can take charge to provide amenities and facilities in the form of clean water provision, medications/vaccinations, and improved sanitation/hygiene for low socioeconomic areas. Chapter 2 will address the literature review and theoretical framework along with the contributing factors responsible for TF spread and transmission in low socioeconomic areas of Gujranwala, Pakistan.

Chapter 2: Literature Review

Introduction

TF is still spreading in low socioeconomic areas globally, and there has not been a research study to evaluate TF spread among women in Gujranwala, Pakistan. Multiple drug resistant (MDR) TF bacteria in Pakistan has escalated the issue and has raised the alarm that TF is a big problem in targeted areas and should not be ignored (Chatham-Stephen et al., 2019). Different intervention strategies such as vaccination, prevention, and antibiotic administration have failed to control TF in Southeast Asia and the Western Pacific areas. It is imperative to find the cause of TF spread in high-risk areas and among low socioeconomic populations as soon as possible (Date et al., 2014; Jackson et al., 2015).

This chapter discusses the literature search strategy, the methodology used in the literature, its theoretical framework, the HBM, and factors causing TF expansion in low socioeconomic areas. The crucial factors examined in this study included the sociological, environmental, ecological, and climatic (CDC, 2016; Garrett et al., 2022). Low standard hygiene practices in the area, such as poor handwashing habits, not covering food, contact with TF infected individuals, usage of unfiltered water, poor sanitation, and flawed sewage systems, were causing the disease spread in the targeted areas (Ersser et al., 2014).

This literature review explored the cultural, traditional, religious, social, environmental, and everyday health practices individuals adopt while living in Gujranwala, Pakistan. The main idea was to gain insight into women's experiences

regarding TF and its rapid spread. There was no previous information available on how individuals in low socioeconomic areas of Gujranwala, Pakistan behaved toward TF infection, their attitude towards infectious diseases, or what steps they took for prevention and treatment to control the disease spread (Kuijpers et al., 2018). Previous studies included surveillance and treatment or vaccination, but no ethnographic research studies or methodology to combat or contain TF, particularly in low socioeconomic areas (Barac et al., 2018; Mogasale et al., 2016). Psychological and educational interventions become impossible when there is a lack of detailed study of low socioeconomic areas (Ersser, 2017). Kuijpers et al. (2018) argued that the prevailing environment, climate, culture, behavior, health-seeking attitudes, and behaviors toward a disease are pertinent to understanding the spread of TF.

Literature Search Strategy

Most of the relevant literature was obtained via the online library of Walden University. The following databases were used to search for appropriate literature: ProQuest, ABI/INFORM Global, CINAHL, MEDLINE, EBSCOhost, PubMed, Cochrane, and Google Scholar. Other search engines included SAGE journals, Science Direct, and LexisNexis Academic. The search terms used were *typhoid fever and attitudes of individuals*, *typhoid fever and social factors*, *typhoid fever and low socioeconomic area*, *typhoid fever and Pakistan*, *typhoid fever and vaccination*, *typhoid fever and education/knowledge*, *typhoid fever and census*, *typhoid fever and treatment*, *typhoid fever and prevention*, *typhoid fever and climate*, *typhoid fever and control*, and *typhoid fever and women*. Very few articles were found for women, particularly young,

childbearing women. Over 100 articles were reviewed, including those that were peer-reviewed and non-peer-reviewed. The literature search consisted of articles published within the last 10–14 years (2008–2022); however, articles for some theoretical frameworks are older.

Methodology Used in the Literature

Qualitative methodology provide details about behaviors toward TF in low socioeconomic areas. The attitudes and knowledge of the population dwelling in low socioeconomic areas regarding TF are crucial because sometimes religion and ethnic beliefs can influence individuals (Glanz et al., 2015). Qualitative methodology helps provide insight into current practices in certain low socioeconomic areas. Qualitative methodology helped me to understand why TF is spreading and causing incidences of disease at a higher rate despite the availability of medical treatments (Frempong et al., 2018). It is important to explore how and why individuals behave the way they do when they are sick? And it is vital to investigate factors affecting their health-seeking behaviors. TF is engulfing low socioeconomic inhabitants badly, and the number of TF patients is rising every year (Jena et al., 2017).

Qualitative interviews or asking direct/indirect questions to subjects make many things clear about their attitudes, behaviors, and their thinking process in sickness (Kuijpers et al., 2018). Kuijpers et al. (2018) clearly explained the thinking and behavior of individuals when exploring their choices to treat diseases after conducting a study in which they observed patient's behaviors. The researchers conducted partial interviews, and one focus group to determine how their study participants accepted medical treatment

(Kuijpers et al., 2018). An individual's attitudes depend on the thinking process, knowledge, experience, exposure, practices, observation, and economic and social placement (Kuijpers et al., 2018). Qualitative data collection includes interaction with participants directly. Qualitative methodology depends on interviews (i.e., focus groups, face-to-face interviews, an ethnographic approach, partial-interviews, observation, informal conversations, or keeping diaries) data collection and then analysis of data collected (after interpreted into themes) via NVivo (Kuijpers et al., 2018).

A qualitative study with ethnography is characterized by research with more observation and less interaction with individuals, but at the same time, the subject's views are essential (Kuijpers et al., 2018). Ethnographic research study is also becoming popular. Kuijpers et al. (2018) conducted their study in Cambodia, combining one focus group and performed partial or semi structured interviews of 10 purposefully selected participants. The study findings revealed the health-seeking behaviors and attitudes of an economically driven society and how necessary it is to spread awareness and education in these areas. Women are neglected and hence suffer more in low socioeconomic areas. Women can become carriers of TF disease and can transmit the bacterium to their offspring via the transplacental route (Jena et al., 2017). Qualitative methods can help address a dire need to consider healthy habits, behaviors, attitudes, and, consequently, health-seeking actions to control TF before it becomes endemic and out of control.

Health Belief Model (HBM)

The HBM is suitable for research on disease control in a designated area in a developing country like Pakistan. HBM theory is an effective way to investigate health

issues or community issues, and scholars use HBM to explore different angles of their research. In the social and behavioral sciences, behavioral change is like a public health intervention for the researcher and a way to handle a health issue (Glanz et al., 2015). There are two central beliefs in HBM, and individual's responses revolve around opinions in health threat and trusting ineffective response strategy (Makoge et al., 2017). According to Makoge et al. (2017), the environment and conditions in which individuals live affect their health and how they deal with their diseases. Makoge et al. studied the health-seeking behaviors of 21 students and 21 camp dwellers via interviews, and results are seen using thematic analysis, which shows that individuals use multiple sources to cope with poverty-related diseases.

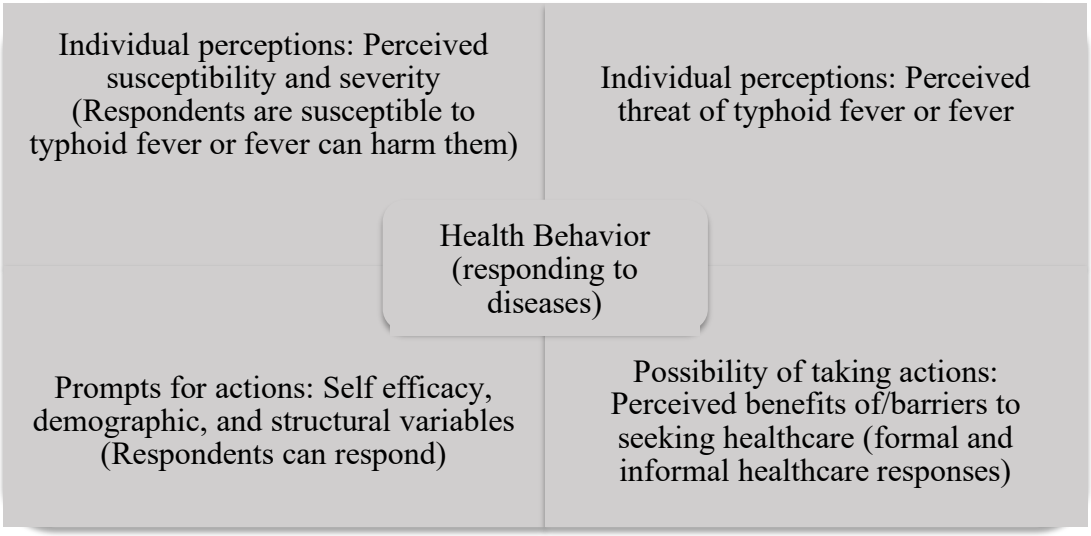
Also, there is a close relationship between disease perception and environment, finances, reliability, and healthcare facilities (Makoge et al., 2017). Figure 2 depicts the HBM model and shows how actions depend on the perceived susceptibility, severity, and threat of the disease. An individual usually responds using norms of the society and culture or uses their learned knowledge from authenticated sources. Figure 2 also shows how individuals learn, what threats they perceive, and what thinking they have according to the behaviors they observe in other individuals. The behavior of an individual depends on many things. A scholar should look at all the angles and possibilities of an individual's reaction towards disease and observe the attitudes and beliefs of an individual towards a situation (Glanz et al., 2015).

After looking at all the angles of a particular disease condition, scholars can recommend interventions. Sometimes the interventions do not work, and then a scholar

should research where the problem lies (Meadows et al., 2019). TF is still not controlled, and it is still spreading in low socioeconomic areas (Makoge et al., 2017). One possibility is that individuals' beliefs, attitudes, and behaviors toward the disease are the fundamental flaws. Educating them or helping them understand the disease and its consequences can help curb the disease's spread (Meadow et al., 2019). TF is a preventable disease with vaccination, management, and treatment, but (especially in Pakistan), it is still a health threat (Stoesser, 2013). The HBM is used to understand the connection between all these factors.

Figure 2

Health Belief Model for TF Disease



Glanz et al. (2015) explained how HBM helps researchers understand why individuals fail to adopt disease prevention strategies when early disease detection strategies are within their reach. Glanz et al. (2015) demonstrated via HBM that individuals can slowly change their behavior positively after understanding the problem,

as HBM is a practical framework for behavioral change. HBM helps solve health issues (i.e., the control of TF among young women living in low socioeconomic areas of Gujranwala, Pakistan). The HBM can gauge the population's intentions and introduces innovative, practical, and adaptable health interventions. Jones et al. (2015) described how the HBM explored and helped in communication and promoted healthy habits among the community members.

The HBM is the most heavily studied theory, and researchers use it in various situations (Jones et al., 2015). Jones et al. (2015) conducted surveys in Indiana from May 2010 until June 2010 after an eight-month media campaign from October 2009 to May 2010 for H1N1 flu vaccination. The researchers asked if the participants received the H1N1 flu vaccine, and only 23.3% of adults received the flu vaccine from 2009 to 2010 (Jones et al., 2015). The hypothesis for the survey was "that encoded exposure (campaign exposure) would positively relate to the vaccination behavior" (Jones et al., 2015, p. 569). In this research, there were five variables including: (a) gender, (b) age, (c) education, (d) flu shot history, and (e) H1N1 flu history (Jones et al., 2015). The results show that exposure to the campaign had a positive effect on vaccination behavior.

Moreover, Jones et al. (2015) explained that the five constructs of HBM are vital targets for public health officials, and they seek to change behavior towards barrier, benefits, efficacy, and threat. According to Jones et al. (2015), the complex hierarchy of HBM includes a moderator (self-efficacy), one mediator (barrier), and a casual chain (benefits). The connection is between an individual's behavior and what they face (moderator) like named barriers, benefits, self-efficacy, and threat (Jones et al., 2015). It

is essential to understand the community's culture and what individuals believe and think while living within their practical limitations (i.e., low education, low income, less exposure, and little knowledge of the advanced world). It is also very important to study the route of spread and disease behavior in a region. There are different factors, yet to explore, which cause TF spread in endemic or targeted areas.

Tilahun et al. (2017) analyzed and proposed a compartmental nonlinear deterministic mathematical model for the TF outbreak and optimal control in a community with varying populations. Tilahun et al. (2017) used the stability theory of differential equations and primary reproductive numbers, representing the epidemic indicator. The model exhibited two judgmental divisions and sensitivity analysis (Tilahun et al., 2017). According to Tilahun et al. (2017) optimal control applies principles and four control strategies including: (a) prevention, (b) sanitation, (c) proper hygiene, and (d) vaccination (i.e., treatment strategies via adequate medication and screening carriers). The numerical and the deep understanding of typhoid outbreak, control, and dynamics helped introduce the health interventions. These interventions consisted of cost-effective prevention and treatment methods to eradicate TF (Tilahun et al., 2017).

Meadows et al. (2019) applied the HBM to examine social media messages during the California measles outbreak in 2015. Out of the most tweets, messages on Twitter™, 41.4% were regarding the severity of the disease outbreak, and 13% of the disease and its discussion only (Meadows et al., 2019). The other tweets were about personal opinions (33.7%), resources (19.4%), personal experiences (2.5%), questions (1.6%), and fewer actions (cues) regarding disease (18.9%) itself (Meadows et al., 2019).

In other words, HBM was used as a pathway to observe the trends of a community or group of individuals.

Perceived Severity

The perceived severity of any situation compels an individual to decide and then act accordingly. Hence this is an essential construct because it helps individuals adopt healthy habits immediately when they learn or know about the consequences (Shojaei et al., 2016). Perceived severity (i.e., how bad the consequences are) is a scare factor, and it will help individuals understand that although it is overkill, the actual situation of TF spread is also severe (Rasul et al., 2017). When someone gets information that TF is a disease that spreads via the fecal-oral route, they may start washing their hands after using the toilet or before eating food. Also, they may try to improve the toilet or sewage system. Additionally, they may start covering their food after cooking it thoroughly and start drinking filtered, boiled, or bottled water. These immediate hygiene-related habits are adopted as a precautionary measure by observing other individuals who suffer or get a fever, chills, diarrhea, vomiting, and abdominal cramps/pain. Hence this research will help determine what level of disease severity is known and perceived among community individuals, especially women.

Individuals must understand the severity of the disease and the virulence of the pathogen to follow preventive methods or treatment methods promptly (Jena et al., 2017). In the same way, when individuals came to know that Coronavirus 2019 (COVID-19) was a deadly virus in 2020, some people immediately started to follow rules of wearing masks, washing hands, and keeping six feet of distance apart from each other. Most of the

time, individuals living in low socioeconomic areas have poor education levels and scarce resources; hence, they fail to understand the severity of diseases, their side-effects, or their complications (Jena et al., 2017). Despite government policies, the economics that drive individuals to seek healthcare, these low-income individuals still rely on herbal medicines and home remedies first, which can complicate cases of TF disease (Kuijpers et al., 2018).

There is an emergent need to introduce a health care program in such areas to raise awareness and literacy rates so residents can understand diseases and their consequences if left untreated (Kuijpers et al., 2018). For example, if left alone and not treated with medication for 2–3 weeks, TF, in some individuals can cause intestinal hemorrhage and perforation (Jackson et al., 2015). TF is a complicated disease. TF is also a life-threatening disease, and the incubation period lasts from 6 to 30 days (Jackson et al., 2015). Innovative diagnostic and treatment modalities for these poverty-stricken areas are needed to control and eradicate TF (Voysey et al., 2020).

Individuals often do not understand the severity and consequences of diseases unless educational intervention is introduced (Shojaei et al., 2016). In this research study, focus was on the perceived severity construct of HBM keeping TF in perspective. It is a concept that has not been studied among women from low socioeconomic areas like Gujranwala, Pakistan. Main aim was to deeply examine HBM concepts to determine potential interventions and behavioral changes among community people of the target areas.

Factors Causing TF in Low Socioeconomic Areas

Various factors affect TF in different areas, but low socioeconomic regions suffer the most. These factors include climate, demographics, ethnographical, ecological, sanitation and hygiene, provision of safe, clean drinking water, updated sewage systems, reporting of diseases, personal attitude, perception of illness, individual behavior, and decision-making concepts. Kuijpers et al. (2018) conducted a research study using qualitative methodology combined with an ethnographic approach to evaluating the socioeconomic, environmental, and economic parameters. Then all were combined with the quality of life and predict the effects of TF. The researchers discussed taking precautionary measures and combat the disease (Kuijpers et al., 2018).

Furthermore, in addition to the environment, climate, and demographic placement the study findings showed that socioeconomic status and health-seeking behavior play an essential role in TF spread and its complications in a community (Kuijpers et al., 2018). Jalani et al. (2019) on the other hand, conducted a study on 144 participants comprising of three age groups (1–10 years, 11–20 years, and above 20 years old) and described how difficult it was to timely diagnose and treat TF when there is another co-infection. Jalani et al. (2019) found that co-infection with typhoid and malaria is a common diagnostic challenge for TF. Hence a more reliable, sensitive, and specific diagnostic tool is needed for TF diagnosis (Jalani et al., 2019). Jalani et al. (2019) also added that the providing clean, safe water, sanitation, hygiene, and a clean environment in high-risk TF areas could lower the risk of diseases. These modalities are unavailable in low socioeconomic areas. The spread of TF can occur via chronic carriers of TF (Darton et al., 2017).

Exploration of an individual's behavior and attitude toward the disease, regarding TF, was done in this study. Also, how health-seeking behavior can be detrimental when individuals face economic constraints was another issue with low-income group of people. In low socioeconomic areas, when someone, especially females, get febrile illnesses, the first line of treatment is the religious following, which the guardians impose on women, and the initial steps toward therapy according to their beliefs and low education involves cost effective home remedies (Kuijpers et al., 2018). These cause delays in reporting and issues to treat typhoid in time and sometimes can be challenging (Mogasale et al., 2016). The time factor is crucial because it explains how individuals get sicker and sicker, and complications can arise due to delays in professional healthcare management.

The Impact of Climate

Climatic conditions play a significant role in proliferating S. *typhi* bacteria as the hot, humid, wet climate of Pakistan is ideal for bacterial growth (Wu et al., 2016). In addition to unhygienic conditions and limited resources for sanitation requirements in low socioeconomic areas, climate also affects individuals' moods and their untoward behavior toward the spread of TF (Nasstrom et al., 2017). Wu et al. (2016) asserted there has been a rise in temperature by 0.74-degree centigrade in the 20th century, and global sea levels have risen about 1.8 mm per year since 1961. Arctic Sea ice is shrinking by 27% per decade (Wu et al., 2016). Moreover, glaciers are contracting, water in the oceans is becoming more acidic, and we face extreme weather changes (Wu et al., 2016). The Intergovernmental Panel on Climate Change predicted a rise of 1.5-5.8 degrees

centigrade change globally during the 21st century, including heatwaves, floods, and droughts (Wu et al., 2016). Due to climate change, more stress is being placed on infectious diseases comprising pathogens, vectors, hosts, and the environment (Wu et al., 2016). Climate change is also responsible for the seasonal distribution of infectious diseases, the timing and intensity of disease outbreaks, and disease transmission (Wu et al., 2016). Warm and unpredictable climatic conditions play an ever-growing role in propelling worldwide emergence, resurgence, and redistribution of infectious diseases (Wain et al., 2015).

According to Rasul et al. (2017), the frequency of infectious diseases and TF was seen more in the Gujrat area of Pakistan. Rasul et al. collected data from 382 cases of confirmed TF via a structured questionnaire prepared with the help of a physician, and found out that season, water quality, contaminated food, poor sanitation, overcrowding, and vaccination rates significantly affect the spread of TF in populations. Gujrat city is close to Gujranwala and share almost same weather. In Gujrat, the weather is hot, humid, and wet, with almost no resources for sanitation, cleanliness, updated sewage systems, or provisions of clean and safe drinking water (Rasul et al., 2017). Rasul et al. (2017) explained the following factors causing spread of TF (only those factors that are not self-explanatory were discussed). These factors include: (a) decision-making delays, (b) poor sanitation, (c) poor personal hygiene, (d) poor lifestyle, (e) unsafe drinking water, (f) outdated/nonexistent sewage systems, (g) contaminated food and drinks, (h) a hot, humid, and polluted environment, (i) carriers of TF and individuals who are unvaccinated, (j) flooding, (k) rainfall, (l) low levels of education, and (m) traveling to endemic areas.

Decision-Making Delays

Individuals who live in low socioeconomic areas of Pakistan have few decision-making powers and abilities. The decisions mostly trickle from elders or older family members to household men and then to women (Rizvi et al., 2014). They are afraid to expose themselves to modern science and depend more on primitive health care practices because they think they are safe and easy to adopt home remedies and diet modifications (Kuijpers et al., 2018). Economic-driven health-seeking behaviors propel individuals to take safety measures consulting their elders and try their methods to combat the disease. These actions often delay their arrival to healthcare professionals, and sometimes, the infections spread and risk patients' lives, primarily through intestinal perforation (Kuijpers et al., 2018). These complications debilitate many patients' life. Many times, patients seek medical help after trying out self-medication, only when the disease symptoms keep occurring or their fever never subsides, or other symptoms like vomiting and severe diarrhea along with dehydration occur (Kuijpers et al., 2018). Many febrile illnesses show the same signs, and medical professionals disagree with the final diagnosis of the disease (Voysey et al., 2020). Voysey et al. (2020) explored that data are missed when patients refuse typhoid blood culture tests, and individuals fail to get proper medical treatment for TF. When these TF disease patients prefer not to go to the health care facility/hospital, then later they develop TF complications.

Poor Sanitation

Factors responsible for TF spread are found in low socioeconomic areas because the provincial and federal governments fail to focus and spend money on uplifting the

environment, sanitary conditions, and hygiene levels (Mehmood et al., 2015). The availability of clean, safe drinking water and sanitation standards are essential in these areas (Cohen, 2018). Rasheed et al. (2019) encouraged clean, safe, or boiled water in cooking and discouraged unnecessary antibiotics to reduce morbidity and mortality against the drug-resistant *S. typhi*. Often low socioeconomic areas are poorly sanitized with unclean environment creating an ideal place for bacteria to flourish. Im et al. (2021) stated a sanitized environment and improved water quality can reduce the TF infection up to 95%. It encourages the adoption of healthy hygiene habits. The adoption of other inexpensive preventive modalities like keeping food away from flies, covering food items, using clean, filtered water, washing hands, using a proper sewage system, keeping the environment clean, and raising hygiene levels can also help in combating TF in low socioeconomic areas (Rasheed et al., 2019).

Socioeconomic Factors

Individuals living in low socioeconomic areas are often poorly educated or low educated with limited awareness. These individuals survive with low incomes, dwelling in lower living standards than individuals living in high socioeconomic regions (Barac et al., 2018). Low socioeconomic areas consist of community-dwelling farmers, masons, low level tailors, painters, daily wagers, and hawkers (i.e., poor individuals who sell their products in a basket either on their heads or bicycles, roaming on roads). Individuals living in low socioeconomic areas usually give importance to house cleanliness because of surrounding pollution and dust in the area. Some cultures stress covering food, keeping a high level of cleanliness and hygiene (i.e., frequent hand washing, wiping of house

furniture daily, daily washing the floors of a house, and cleaning the house daily). The lack of landscaping and asphalt-less roads and sometimes cow and horse dung on these roads get mixed with dirt which can result in a great deal of dust pollution inside houses in Pakistan.

Some families in Gujranwala, Pakistan, do not give much attention when a female in their family contracts a febrile illness, and they ignore them due to gender inequality and monetary issues (Rizvi et al., 2014). On the contrary, these women seek help from quacks, midwives, religious leaders, or an older adult in the family to save money. In addition, women face neglect when they feel sick in the culture of Pakistan (Rizvi et al., 2014). According to Jena et al. (2017), women can face complications of TF (i.e., miscarriages, fetal demise, poor health, including lethargy, untreated diarrhea, and fever, leading to loss of appetite and further downfall of health with conditions such as anemia and tuberculosis). Sometimes they become carriers of S. *typhi* if not treated with medication (Jena et al., 2017). Also, women get future complications from untreated TF (i.e., digestion problems, intestinal perforation, preterm birth, uterine infections, and fetal miscarriage due to vertical transmission of bacteria from an infected mother (Jena et al., 2017).

Attitudes

According to Steckler et al. (2010) HBM is a valuable tool to gauge an individual's opinion, as different individuals have different views and attitudes towards various diseases. Steckler et al. (2010) explained that with the provision of information, knowledge, and awareness, it is easy to change an individual's opinion in a positive

direction. HBM is also a compelling psychological model to measure an individual's intention (Glanz et al., 2015). Strategies or programs can motivate individuals from high-risk areas to accept medications for treatment and vaccination for prevention (Wierzba & Sanders, 2019). Janjua (2018) explained how a healthy living style could reduce the risk of contracting diseases. Many febrile illnesses are dealt with at home remedies through diet restrictions, old herbal remedies, and fever-reducing agents from the local pharmacy, instead of diagnosing the cause of fever first (Kuijpers et al., 2018). This attitude can delay and sometimes create hurdles diagnosing TF promptly (Kuijpers et al., 2018).

Reporting Issues

The spread of TF shows that the situation has gone from bad to worse and from worse to alarming, especially with the emergence of multiple drug-resistant typhoid bacteria, and extensively drug resistant typhoid bacterium (Chatham-Stephens et al., 2019; Rasheed et al., 2019). Many times, sick individuals do not report their sickness in time, especially in low socioeconomic areas due to lack of money (Mogasale et al., 2016). Sometimes, individuals living in low socioeconomic areas are reluctant to visit the hospital for minor ailments like fever or diarrhea until the condition worsens. According to Darton et al. (2017) typhoid disease's real burden hinders the lack of population-based studies and accurate laboratory diagnostics. In villages and low socioeconomic areas, individuals tend to consult religious leaders and quacks as the first line of treatment (Voysey et al., 2020). The wrong choice of priorities in sickness and self-medication attitudes results in complications of TF and inaccurate data (Voysey et al., 2020). Under-

detection of cases occurs when individuals do not seek timely medical help or blood tests (Voysey et al., 2020).

Behavior

Behavior towards disease is how individuals act while sick and how seriously individuals take sickness. Individuals behave responsibly only when they have knowledge and awareness of disease conditions. Many individuals living in low socioeconomic areas do not think febrile illnesses are taken care of by medication; hence they seek home remedies, diet modification, and religious prayers first (Kuijpers et al., 2018). They do not report the disease to the professional healthcare system, which hurts them from many angles. The result is interrupted data, misinterrupted data, and missing data regarding the illness, and misconception, misunderstanding the course of the diseases (Voysey et al., 2020). Secondly, individuals get future complications from TF, as it demands timely treatment, like intestinal diseases, chronic diarrhea, indigestion, malnutrition, lethargy, and anemia (Jena et al., 2017). If there is no timely correction, diseases can spread in communities, because disease transmission has no boundaries, leading to endemic and then pandemic situations (Saleem & Hassali, 2019). HBM can help change an individual's behavior, and they can take preventive measures even before traveling to different places.

Social Norms

Individuals like to follow social norms when living in society because they like to follow others. Habitants of low socioeconomic areas tend to follow older adults' advice to change or restrict their diet during TF or febrile illnesses and pursue home remedies

first (Kuijpers et al., 2018). It is common among low socioeconomic dwellers to believe in religious leaders such as Sufis or pirs and ask these individuals to pray for them in times of sickness and febrile illnesses (Kuijpers et al., 2018). There is a need to help individuals of low socioeconomic areas to adopt cost-effective strategies to curb infectious diseases like TF (Tilahun et al., 2017). According to Date et al. (2014), individuals living in low socioeconomic regions require improvements in their social norms, education, awareness, economic issues, and behavior toward the diseases. People need to develop acceptance for timely, cost-effective vaccination and medical treatment supervision of a professional healthcare system.

Early Intervention and Prevention

TF spread is prevalent in low socioeconomic areas, and many programs, including surveillance, have failed to control TF and its consequences on individuals (Date et al., 2014). Disease control is possible with cost-effective programs giving promising results (Tilahun et al., 2017). There is a need to introduce innovative and practical health interventions in this modern era (Glanz et al., 2015). This requires joint efforts with the local community. In developing countries and low socioeconomic regions of the world, TF and its associated complications require timely diagnosis and professional (health care worker's) management of the disease (Khanna et al., 2015). Intervention management strategies must impact the first change in behavior/attitude towards TF, its timely diagnosis, and its treatment with effective antibiotics. According to Kuijpers et al. (2018) Pakistan officials should introduce an organized program for intensive research to acquire real data and census information regarding confirmed TF cases and complications. TF

transmission control is possible through changes in health-seeking behaviors and positive attitudes. Jena et al. (2017) explained that women need to change their unhealthy attitudes, resulting in septic abortions due to vertical transmission (transplacental route) of *Salmonella enterica typhi*, which can further cause genitourinary infections.

Rasheed et al. (2019) showed their concern regarding the emergence of extensively drug-resistant TF bacteria cases. The use of inappropriate and unnecessary medications due to wrong health-seeking behaviors can also lead to diagnostic uncertainty (Kuijpers et al., 2018). Meadows et al. (2019) explained that *S. typhi* must be considered as one of the high priority virulent pathogens because unnecessary exposure to antibiotics is causing the bacterium to show resistance to antibiotics (i.e., third generation cephalosporins, ampicillin, trimethoprim-sulphamethoxazole, fluoroquinolone, and chloramphenicol), and new more effective antibiotic development is in high demand to save individuals' lives. Identifying high-risk areas for TF spread is essential (Chatham-Stephens et al., 2019; Janjua, 2018). Strict surveillance is still required to watch for the reasons or factors responsible for the TF spread in a particular area (Date et al., 2014). Planned programs are necessary to combat TF in low socioeconomic areas (Frempong et al., 2018). It is essential to promptly diagnose the infectious disease so that early healthy interventions regarding the acceptance of medical treatment and disease control steps/programs can be implemented (Bulage et al., 2017).

The strategies of screening, vaccination, and treatment are essential to containing TF disease. The effective typhoid conjugate vaccine for children is still not available in low socioeconomic areas of Pakistan. Research regarding introduction of TF

polysaccharide vaccine among school-aged children (Grade 1 to Grade 10) has shown fewer side effects and positive effects overall including parents' satisfaction (Khan et al., 2015). TF vaccine is available in Pakistan. Many countries take typhoid prevention by introducing a typhoid-conjugate vaccine (Wierzba & Sanders, 2019). TF tests must be done in all suspected cases. The studies show that the Tubex-TF test is a better diagnostic test for TF than the low-cost ones (used in Pakistan) such as Widal's test and typhi-dot test (Khanna et al., 2015).

Integrating Preventive Intervention

Efficient programs and methods are required to control the spread of TF, particularly in Pakistan's neglected low socioeconomic areas. The health issues starting from missed or poor diagnosis to ineffective medications/vaccination are still present in Pakistan (Mogasale et al., 2016). Awareness regarding different species of *S. typhi* causing typhoid is necessary (Wain et al., 2015). Stakeholders along with the government must implement vaccination programs in high-risk areas.

The WHO recommends proper vaccination and medications to control TF in high-risk areas (Wain et al., 2015). Treatments involve medications and sometimes prolonged admission and medications administered by certified professional health care personnel. According to Jackson et al. (2015), two types of TF vaccine, parenteral (Typhim Vi polysaccharide) and oral (Vivotif-live attenuated), are available for the high-risk areas where *S. typhi* is resistant to drugs or fluoroquinolones. Typhoid vaccination is repeated due to high bacterium virulence because the previous vaccine was not useful, and now the typhoid strain is resistant to antibiotics (Jackson et al., 2015). Improved vaccination

and treatment medication is the answer to contain and manage TF till effective eradication methods are endorsed.

Preventive steps like washing hands, using clean, safe water (boiled or filtered water), cooking food, covering food, avoiding street food and drinks, keeping houses free of flies and mosquitoes, and adopting hygienic habits are easy to introduce, and sometimes they are cheap and can quickly help individuals without any cost. Education and understanding TF can prevent diseases (Kuijpers et al., 2018). Most of the time, the delivery of effective or practical directions and messages is needed for individuals to follow and keep themselves safe by taking vitamins, medication and adopting preventive measures (Jena et al., 2017). In this modern time of technology, social media (radio/television/Internet/smartphones), billboards, signs, or advertisements (written signs on shops, roadsides, hospitals and in public places such as libraries, schools, colleges, universities, hotels, hostels, hospitals, and gyms) can deliver messages. Communication such as lectures in community centers, schools, and clinics are also important. It is essential to introduce and implement modern preventive methods to individuals, especially women, from low socioeconomic communities to curb TF spread in Pakistan (Jena et al., 2017).

Summary

TF disease is a constant health problem and is endemic to low socioeconomic areas of the world (Kuijpers et al., 2018). Simultaneously, the prevention of TF is within the modern health system (Jena et al., 2017). Every year 12 million to 27 million individuals get infected *with S. typhi* annually worldwide (Darton et al., 2017). About

200,000 deaths from TF annually are recorded (Jena et al., 2017). TF may not be a problem for developed countries. However, *S. typhi* is a threat to developing countries in Southeast Asia and Southcentral Asia because the rate of infected individuals is >100 per 100,000 individuals (Jena et al., 2017). Previous studies researched factors causing TF and remedies to address them e.g., environmental cleanliness, clean water/food consumption, and sanitation etc. Previous research also involved various diagnostic modalities, medical treatments, and vaccination as preventive methods, conversely this research study involves personal behavior. This literature review helped identify a gap in the understanding of TF spread by demonstrating a need for research targeting women in low socioeconomic areas of a developing country who have previously been given no voice. The behavior and attitude towards the TF disease and its spread were never investigated before. Chapter 3 will provide details about the study methodology.

Chapter 3: Research Method

Introduction

TF is a constant burden for individuals living in low socioeconomic areas due to its side-effects and health consequences. This study's primary purpose was to explore lived experiences of women with TF disease in the city of Gujranwala, Pakistan. The study's phenomenological design helped elucidate the participants' personal TF experiences and promoted an unbiased investigation. This chapter will discuss the research design (i.e., qualitative approach), recruitment of subjects, interviews, and derivation of themes from collected data. The protocols explained in Chapter 1 are considered and address all ethical issues. The researcher role as well as the ethnographic considerations are also discussed.

Research Design and Rationale

A qualitative, phenomenological research design was used to explore the TF experiences of young women living in Gujranwala, Pakistan. Semistructured interviews were conducted over the telephone and audio-recorded following safety protocols required during the COVID-19 pandemic. The qualitative approach explained personal views, attitudes, and experiences of TF in present living scenarios (see Creswell, 2013). The question of *how* and *why* TF spreads pointed to the importance of exploring the phenomenon (Creswell, 2013; Patton, 2015). Qualitative methodology helps to identify the subjects' biases and living experiences (Creswell, 2013). Interviews also focused on discovering participant's attitudes, beliefs, and feelings. Participants were approached in

their natural setting for interviews, making them at home in their geographic comfort zone.

The ethnic background of the individuals living in low socioeconomic areas of Gujranwala, Pakistan, has seldom been discussed before. The ethnographic view can make the research more interesting because it can explain the cultural and habitual reasons (if any) for spreading the disease in these areas (Shaw, 2018). In the semistructured telephonic interview inquiry process, the participants were asked open-ended questions according to their experiences. Data were collected via semistructured telephonic interviews, which were recorded (audio) after the participant's permission (see Burkholder et al., 2016). Data collected from participants were based primarily on their personal experiences, stories, and difficulties they faced regarding TF and its spread. The participants gave their views about what they observed and how the disease was tackled in their own house or community. These women also gave their own views about how to control TF spread in their areas. This study can give insight into how these women behaved as well as their attitude towards TF.

After data collection, interviews were transcribed and translated. Then data was analyzed to form themes or categories so that the data can be presented in a narrative form (see Creswell, 2013). After drawing themes, inductive logic was used to look for broader patterns and compare the theories to past experiences (see Creswell, 2013). In addition, constructs of the HBM theory were used to frame the results of the study and help identify solutions for prevention of TF (see Glanz et al., 2015).

Research Questions

The following are the main research questions used in this study:

RQ1: What are the attitudes and beliefs regarding TF prevention and treatment among women of childbearing age in Gujranwala, Pakistan?

RQ2: What are the perceived cultural barriers to TF prevention and treatment among women of childbearing age in Gujranwala, Pakistan?

RQ3: To what extent does the severity of TF impact the decision-making process of women of childbearing age in Gujranwala, Pakistan?

The Role of the Researcher

All the protocols for documentation, collection, interpretation, and analysis of data were taken into consideration. As a gynecologist, physician, practitioner, and lead investigator, I have extensive professional experience working with other health care team members in the treatment and prevention of diseases in Pakistan. My professional experience with infectious disease cases provided the impetus for this study. However, I am a permanent resident of the United States and currently live there. I grew up in Pakistan until the age of 19 years and then came to the United States. Before coming to the United States, I worked as a teacher in Federal Government High School Gujranwala, Pakistan. I am fluent in the Urdu language and know a little bit of the Punjabi language; therefore, I only consulted with a Punjabi translator during transcription of complex responses from two participants in this study.

The chance for a researcher's bias was considerable in this study (sympathetic inclination). Also, the subjective nature of this study required a nonjudgmental

assessment of biases. This research study was related to my interests, inclinations, and opinions. The intention to observe and measure the degree and extent of Gujranwala women's hygiene practices and activities during the interviews was helpful. Questions regarding TF disease treatment or medication, routine cleanliness, the sewage system, and the availability of clean drinking water were asked during the interviews. The subjects' answers to all the posed questions, their views on solving the issues and how they react during the interview were recorded. The researcher's bias, especially personal feelings, may have emerged during the interview. The main objective was to report accurate outcomes and findings while controlling the inner emotions and biases and explaining the participants' cultural views (see Patton, 2015).

Institutional Review Board (IRB) approval was received before collecting and using any data for research study purposes (IRB approval number 01-28-22-0292264) (see Burkholder et al., 2016). As the primary data collector, interpreter, and analyst, I ensured an open, transparent communication environment to address any accidents, biases, or confrontations between participants and myself. A pilot study of interview protocols helped ensure the semistructured interview guide's integrity, reliability, and validity. The outcome of this pilot study was recorded, documented, and analyzed to gather helpful information to maintain standards of instruments and strategies. A journal was kept for self-assessment and evaluation, along with a written log of specific information about the study that will be kept for at least 5 years.

Methodology

Participant Selection Logic

Women were selected from low socioeconomic areas of Gujranwala, Pakistan. These young women have low levels of education, almost no jobs, and depend most of the time on their husbands or elders/fathers for monetary funds to run the home and maintain personal needs. Healthwise they were anemic and weak. They face challenges regarding their health, and they often hide their diseases. Most of the time, women from these areas must follow the older/elderly family members' instructions (Ali et al., 2011). It was imperative to interview them and listen to their voices to offer first-hand experience of what they live through regarding TF disease (Patton, 2015).

Population

The Gujranwala urban population is 2,065,260, out of which rural women are approximately 1,030,581 (Population of Pakistan Census, 2020). Gujranwala is a city with religious individuals (both Christians and Muslims live and follow their religion strictly), and many of the families followed a conservative lifestyle. Women in this area either live with family or their parents. They live in homes with at least one or two cell phone, used by the husband or household figure to find work and communicate with business individuals, family, and friends. Knowing that, based on observation, these individuals charge their cell phones with local phone cards daily or weekly. Fortunately, there were no issues with phone communication in this population.

Sampling Strategy

Purposeful sampling was done to recruit women living in low socioeconomic areas of Gujranwala, Pakistan. Purposeful sampling is a non-probability sampling method, and it occurs when elements selected for the sample are chosen by the researcher's judgment. (Patton, 2015). A purposeful selection of participants was used to represent typical women living in low socioeconomic areas of Gujranwala, Pakistan.

Selection Criteria

Participants in the study were females aged 18-45 years and of childbearing age, preferably married with children. These criteria also gave insight into an experienced pregnant woman with TF and how she handled her situation with or without the disease. An attempt was made to select participants with some TF experience. These criteria helped determine how TF affects women in this region and elucidate their views on preventing and controlling TF.

Sample Size and Saturation

Saturation is the cutoff point for data collection or data analysis in qualitative research (Saunders et al., 2018). There are four ways to gauge saturation including: (a) inductive or deductive reasoning, (b) data collection, (c) data analysis, and (d) theorizing (Saunders et al., 2018). Saturation plus other factors also determine the sample size including: (a) heterogeneity of the population, (b) number of selection criteria, (c) the topic selected, (d) the scope of research study, (e) special interest groups requiring intensive study (the type of study), (f) multiple samples, (g) the type and quality of data collection methods, and (h) resources available including monetary funds (Guest et al.,

2020). For phenomenological studies, Creswell (2013) recommended a sample size of five to 25, and Morse (1994) suggested at least six. The sample size for this study was 10 participants, which was sufficient to reach saturation.

When there was no new information from subjects, or all the study participants gave almost the same answers to the questions repeatedly, the saturation point was reached, and there was no need to add more study participants (see Guest et al., 2020). When the purpose of the research questions is met, and when further investigation becomes repetitive, there is no point in recruiting more subjects, so researchers cut down on their participant recruitment (Mason, 2010). In this research study, many women, who were low educated, answered similarly because they live in the same environment and cultural setting.

Instrumentation

The data collection instrument for this study was a semistructured interview guide developed by the researcher (see Appendix A). There were 19 interview questions based on constructs in the research questions and health belief model. Interview questions covered participants' knowledge, attitudes, behaviors, and responses towards TF disease.

A semistructured interview guide with predetermined, open-ended questions encouraged participants to answer freely and in detail (Patton, 2015). All questions were asked word for word (verbatim) in the same way to each subject to avoid discrepancies and any intent to change the meaning. Neutral probes were used to clarify participant responses and avoid bias (Creswell, 2014).

Pilot Study

Pilot studies establish the reliability of the research study's instruments (Berry et al., 2019). For this research, the first two participants were included in a pilot study. This pilot study ensured appropriate wording of the semistructured interview guide. The data collected from these participants was not included in the final full study.

Procedure of Recruitment, Participation, and Data Collection

Recruitment

Most of the individuals dwelling in this low socioeconomic area of Gujranwala were not savvy with e-mail, and most of the women do not own a computer or have email accounts. Advertisement for this study was done using flyers posted on social media via TikTok and Facebook, flyers posted on roadside, cell phone text messages/WhatsApp messages, and friends texting friends about the content of the flyer/invitation. Maximum response was via roadside posters/flyers. Interested individuals contacted me via phone call or text message. The willing participants were able to discuss details of the study and any questions they had regarding the study before the interview.

Interviews

Participants who showed interest in participating in the study provided verbal consent and were informed of the date and time frame to participate in an interview session via a phone call, or WhatsApp call (a trendy communication app in that specific area). A call was conducted in a safe area determined by both parties (i.e., home, or other private, quiet location). The participants were informed ahead that they could refuse to take part in an interview anytime during the process and still be compensated for their

time. I used the semistructured interview guide. Interviews lasted 10–40 minutes and were recorded or audiotaped using a digital recorder or cell phone. These recorded interviews were stored on a password protected flash drive. Upon completion of the interviews, participants were given $20 (equal to approx. 3,300/- Pakistani rupees) compensation and an educational brochure to inform them of feasible COVID-19 and TF prevention methods that they can implement within the context of their unique lived experiences. Participants had their money transferred to their Pakistani bank account or phone number. Participants were asked to refer other potential participants. Participants were welcome to review their recorded interviews and ask any questions even after the interview or later. All interviews were transcribed and translated into the English language by the researcher.

Data Collection

There are different ways to conduct interviews (i.e., face-to-face, focus groups, telephone interviews, and written surveys) although the best are in-person interviews (Creswell, 2013). Interviews are a good bridge of communication between two different individuals having different views. In contrast, participants may feel pressured in a focus group and shy away from telling their personal experiences. However, some individuals also feel very comfortable telling their stories when listening to the stories of others (Creswell, 2013). The interviewer can also observe things closely (i.e., body language, actions, eye contact, and facial expressions) while interviewing the other party in person (Creswell, 2013).

Even though face-to-face interviews were preferred, the COVID-19 pandemic required modified data collection approaches to ensure the safety of the participants and the researcher. Therefore, interviews were conducted via telephone calls. The informed consent form was sent via text/ WhatsApp and discussed first. Participants had to provide verbal consent before continuing the interview. Questions were asked according to the semistructured interview guide and interviews were audio-recorded on my cell phone. The rules of safety, privacy, and confidentiality of subjects were ensured (see Cridland et al., 2015). There were no restrictions, and volunteer participants were allowed to leave the study anytime and be reimbursed for the time they spent with the interviewer (i.e., $8.00, equal to Rupees 1,200.00). As mentioned previously, questions were open-ended, and neutral probing questions were added as needed. The interview length was 10–40 minutes, depending on how busy the participant was and the depth of their responses. At the end of the interview, details about compensation were discussed. Data were collected and saved in an organized manner under lock and key or password protected flash drive to ensure reliability and data security (see Creswell, 2013). The stored data were backed up on a flash drive secured with password and kept under lock and key (see Miles et al., 2014; Rudestam & Newton, 2015).

Data Analysis

I manually transcribed and translated the data immediately following each interview to ensure no information was lost or confused. Transcripts were analyzed using the following qualitative methods recommended by Creswell (2013):

1. Organize and prepare the data (transcripts and interview notes) for analysis.

2. Read all data to get a general sense of information and reflect on its overall meaning.
3. Conduct content analysis with a coding process, organizing material into "chunks," segmenting them into categories, and providing items (codes) for those categories.
4. Generate a description of the setting and participation and identify themes from the coding.
5. Use narrative passages to convey the findings of the analysis.
6. Interpret the meaning of the data.

Issues of Trustworthiness

The validity of data depends upon trustworthiness in the qualitative research study, and consistency in methods and steps used in the study (Creswell, 2013). Onwuegbuzie et al. (2013) stated that trustworthiness is comprised of four components: (a) transferability, (b) dependability, (c) confirmability, (d) credibility, and they are discussed in the following paragraphs.

Credibility

Creswell (2013) explained that credibility is ensured when the researcher evaluates the primary research question. Patton (2015) described triangulation, which can ensure credibility in a qualitative study. The triangulation method compares the observed handwritten notes with the audio transcription made from observation and the participants' final comments. Triangulation reinforces the credibility of a qualitative study and has five forms: (a) data triangulation, (b) theory triangulation, (c) investigation

triangulation, (d) methodological triangulation, and (e) an environmental triangulation (Patton, 2015). Data triangulation was used in this study during the data analysis process. The dissertation chair independently reviewed data and coding to ensure appropriate organization of categories and themes.

Transferability

The data's transferability means that the findings can be applied to other studies, which is just the opposite in quantitative research, where the study is applied to the general population at large (Patton, 2015). Other researchers can use the study results and can apply them to other existing situations (Onwuegbuzie et al., 2013). Hence, there is a need for a clear, rich, and in-depth study of the individuals or participants' lived experiences regarding TF disease and its consequences. Open-ended questions during interviews in this study helped to endorse reliability (see Patton, 2015). Transparency has value in the transferability process (Patton, 2015). In this research study, an attempt was made to maintain all the participant's responses so transferability could be confirmed.

Dependability

Dependability was vital in this research study, and it was ensured by documenting and maintaining all the notes, audios, transcripts, and coding documents for review by mentors and the dissertation chair (see Patton, 2015). The semistructured interview guide was reviewed so that any instrumentation could be corrected before beginning data collection (see Onwuegbuzie et al., 2013). Participants were allowed to express their views openly, and it was ensured that information was recorded accurately.

Confirmability

Confirmability comes when some connection can be found between the source and data collected. The participants' recorded views were free of researcher's bias, personal interests, or advantages. Confirmability is also achieved when participants are free to review their statements for clarification (Patton, 2015). In this research study participants were allowed to review their transcribed interview. It is imperative to link the source of data from which it is obtained to establish confirmability. Confirmability also comes when other researchers who have conducted similar research can also use, evaluate, and admire the study (Onwuegbuzie et al., 2013).

Ethical Procedures

Creswell (2013) stated that ethical considerations and policy issues arise in a project where humans are involved, especially where women are interviewed. The research process involves facing new individuals and asking them questions to obtain information. Confidentiality and keeping the participants' trust is imperative; hence the researcher must follow all the rules and regulations and seek IRB approval (Creswell, 2013). IRB approval was obtained before commencing data collection (IRB approval number 01-28-22-0292264). In this study all the participants' rights, needs, wishes, and views were respected. Participants were sent consent forms via phone text messaging system. When participants' information or collected data were disclosed with in-depth meaning, their safety was ensured, and their identity and exposure were guarded. Following were some rules for the safety of participants:

1. This study was voluntary, and an explicit informed consent was offered for signature. If some participants felt uneasy, they could withdraw earlier.
2. Data were locked up in a safe under lock and key or password all the time including flash drive/thumb drive. Data will be safeguarded for 5 years.
3. Participants were made aware of the methods and objectives of the research study.
4. The Protocol for Human Subjects in Research were obtained and submitted to the IRB at Walden University for approval.

Summary

The main objective for doing this research study on TF spread among women living in low socioeconomic areas of Gujranwala, Pakistan, is to help contain this preventable disease. The participants' accurate information was collected via telephonic audio-recorded interviews following all preventive strategies of the COVID-19 pandemic. Collected data was transcribed and translated in English. Qualitative analysis was used to code, draw themes, and interpret the data. IRB approval was obtained before undertaking this study. Chapter 4 discusses the data collection methods, data interpretation, and results of this research study.

Chapter 4: Results

In this chapter, I explain the research instrument, data collection process, data analysis, and results of my research study about TF spread among women in a specific low socioeconomic area. In this chapter, I present the findings from data collected through in-depth audio-recorded (only) telephonic interviews with women of low socioeconomic regions in Gujranwala, Pakistan. The purpose of collecting this qualitative data was to investigate reasons for TF spread, and examine closely the attitudes, behaviors, and beliefs of women living in low socioeconomic areas, including their reactions to TF disease and TF spread. Interpretation of data is discussed in Chapter 5.

In this qualitative study, I focused on women's lived experiences regarding TF spread in the low socioeconomic areas of Gujranwala, Pakistan. In this region, women are actively engaged in the care management of their family members. An educated woman aware of TF disease can engage and educate other women and take care of other family and community members. Women play a pivotal role in society and can contribute to improving the lives of those around them. Usually, women are the primary caretakers when disease arises, so their education is essential in addressing TF spread.

In this study I used a phenomenological research design to elicit the attitudes, beliefs, behaviors, and experiences of participating women regarding TF spread. The phenomenological research design is based on rich descriptive interviews and in-depth analysis of lived experiences of an individual, which can help a researcher understand the individual's lived circumstances (Finlay, 2009; Giorgi, 2014; Jinruang et al., 2017). In this research study, participants explained their attitudes and behaviors toward TF disease

and their lived experiences of TF, which differs from intellectual generalizations (Finlay, 2009). According to Giorgi (2014), the phenomenological methodology is descriptive and can drive data transformation based on participants' words. Analysis of data collected in phenomenological studies provides a new understanding of participants' paramount expressions communicated in a way that gives an in-depth, and enriched understanding and psychological perspective (Giorgi, 2014). The phenomenological method helps a researcher step into a new world of understanding things from participants' perspectives, which is very helpful in providing health interventions.

As the researcher, I faced challenges when travelling to Pakistan, during the COVID-19 pandemic. Limitations were placed on human subject's research to ensure the health and safety of participants and the researcher. As a result, qualitative data were collected through audio-recorded interviews. I conducted two pilot study interviews and 10 research study interviews with women ages between 18–45 years living in low socioeconomic areas, who have experienced TF while living in Gujranwala, Pakistan. Interviews were conducted during January, February, and March 2022. All participating women experienced TF while residing in Gujranwala City. The participant age group was chosen because they are of childbearing age, and women are primarily involved in raising children and caring for the family. I gave education regarding the importance of hygiene, sanitation, and environmental cleanliness in addition to the use of safe drinking water following completion of the interview.

Research Tools

An interview guide (see Appendix A) comprised of four initial screening questions, five questions regarding demographics, and 16 open-ended interview questions. The first part covered fundamental and demographic questions about gender, family, residential area, and spread of TF in the region. The second portion focused on collecting data to answer three research questions:

RQ1: What are the attitudes and beliefs regarding TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?

RQ2: What are the perceived sociocultural barriers related to TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?

RQ3: What factors impact the decision-making process related to TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?

Setting

This research study was conducted in low socioeconomic areas of Gujranwala, Pakistan. I lived in the area when I was younger, which helped with participant recruitment. The study was limited to this area due to the prevalence and rapid spreading of TF, and because these areas are often neglected, which could be a root cause of disease spread. Most women living in low socioeconomic areas are housewives and stay-at-home mothers. A rural background and low education levels are common among these women.

All documents used for recruitment and data collection (i.e., questionnaire, flyer, and informed consent form) were translated in Urdu, the local language, to ease communication. Interviews took 10–40 minutes; some lasted longer because of poor cellphone connection and others because participants wanted to explain their disease experiences and problems. All participants indicated they were satisfied at the end of the interview, and each participant provided different suggestions. No one encountered any adverse reactions.

A pilot study was conducted prior to the data collection interviews. It included only two participants. Pilot study interviews were helpful and offered some detailed information about the disease spread conditions in the area. The pilot study also aided me in understanding how best to approach women of the area (regarding cultural greetings and listening to their stories). The pilot study data were not included in the final data analysis.

Demographics

Research participants' demographic characteristics are presented in Table 1. A total of 10 women were included in the final analysis. All participants were women ages 18–45 years living in Gujranwala, Pakistan. All participants had low education; nine having attended only elementary school and only one participant having attended high school. Most were wives of laborers earning daily wages; only one participant was unmarried. All participants experienced TF while living in Gujranwala, Pakistan.

Table 1

Participant Demographics

Demographic characteristics	Female (*N*=10)	*Percentage (%)*
Age range		
18–19	1	10%
20–29	5	50%
30–39	4	40%
Marital status		
Single	1	10%
Married	9	90%
Number of children		
0	5	50%
1	1	10%
2	1	10%
3 or more	3	30%
Religion		
Muslim	8	80%
Christian	2	20%
Language		
Urdu	9	90%
English	1	10%
Education		
Elementary school	9	90%
Technical education	0	0%
High school	1	10%
Household income level		
<$10,000	7	70%
$10,000–$20,000	2	20%
$20,000–$30,000	1	10%

Participant Selection

I used purposeful sampling to choose participants who were women ages between 18–45 from low socioeconomic areas of Gujranwala where TF spread is common. Participants were required to have had some experience of TF while living in Gujranwala, Pakistan. I ensured that participants had a cell phone and could communicate openly on the phone. One potential participant expressed a desire to communicate via a third party (her sister-in-law), but I denied such an interview; I wanted to speak directly to participants via cell phone. All participants were comfortable handling normal

conversation on a cellphone. I ensured that participants were alone in a separate room during the interview session. Most of the interviews were conducted in the late morning or afternoon when participants' children were at school and their husbands at work, which ensured no interference. Only one of the pilot study interviews was conducted at 11:00 p.m. nighttime. All the interviews were audio-recorded with permission from the participants.

I interviewed participants in Urdu and then translated to English language. I did all my communication with participants in Urdu language. The translated contents of the informed consent form were texted to each participant prior to the interview, and I answered any queries they had. At the end of the interview, all participants were sent money equivalent to $20 via "jazz cash" or transferred to their accounts. All women were sent a phone number of a mental health facility (providing health care in Urdu language), in case they experienced some distress after the interview and wanted to speak to a professional at no cost. The mental health facility is a confident phone number, offering services in both Urdu and English. At the time of the interviews, none of the interviewed women experienced any untoward effects and reported to mental health services. The interviewed women told me that they will remain excited about my research study and look forward to its publication.

Data Collection

Data collection was started after receiving permission from Walden University and IRB approval of my proposal. Data collection involved a step-by-step process. I traveled to city of Gujranwala, Pakistan, and selected low socioeconomic areas. Two

pilot study interviews were done over the phone in Urdu language to ensure interview questions were adequate, and participants were comfortable. These two pilot study interviews were also helpful in deciding which area to recruit from and how to approach women in the area. No modifications were made to the semistructured interview guide or methodological approach based on the pilot study interviews.

Recruitment commenced by posting the flyer/ invitation (see Appendix B) on social media (i.e., TikTok and Facebook) and on roadsides of TF prevalent areas. The flyer listed my contact number, therefor after one week, I started to receive calls and text messages from different women willing to participate in my research study. I started to screen and helped potential participants understand the flyer/invitation and informed consent form contents (see Appendix C). I gave them one more week to decide and then started my audio-recorded interview sessions with women who met the inclusion criteria for the study. Fortunately, all women, except one who contacted me, were willing to participate in the audio-recorded telephonic interview sessions and understood the informed consent form.

Initially nine women were interviewed. Out of them one participant refused to continue, so I was left with eight complete interviews. I noticed that most participants were from the same sect and religion, and only one individual answered differently. After consulting my dissertation chair, I decided to conduct two more interviews with women who follow a different religion. The area I chose earlier also had a Christian community, so I posted the flyers (see Appendix B) on the roadside in a Christian community. Again,

a few women responded and two women were selected according to the criteria and they participated willingly. Therefore, the final complete sample size comprised of 10 women.

All participants were compensated $20 in the currency of Pakistan (i.e., Rupees 3,000 approximately) at the end of the interview via transfer to their cell phone number (i.e., jazz cash). These audio interviews were recorded on my cellphone. I transcribed these interviews and translated them to English. I texted participants the interviews via WhatsApp to verify the accuracy of the transcript. Upon reviewing the contents of all the transcripts with my dissertation chair, we determined that the saturation point was reached because there were no new answers revealed in the data.

Data Analysis

I used a deductive coding procedure and a flow of codes to mirror the research study questions. I used the interviews which were transcribed and translated in English. Each participant's perspective has its own importance, so each transcript was manually coded, and the codes were reviewed by the dissertation chair. This process ensured that no codes were missed. Table 2 provides information about codes, sources (number of participants) and frequency (how many times) of references.

Table 2

Initial Coding Structure

Code	Source	References
Suffering	10	116
Hygiene/Cleanliness	10	84
Ignorance	10	54
Local fever treatment	10	56
Low education	10	48
Clean water intake	10	39
Faith in TF testing	10	38
Clean environment	10	36
Prolonged sickness	10	30
Subordination	10	27
Clean safe drinking water	10	23
TF spread in area	9	35
Belief in IV medication	9	29
Vaccination	9	28
Ineffective TF treatment	9	18
Lack of sanitation	8	28
Lack of confidence	8	18
Lack of funds	8	16
Home bound women	8	11
Low-cost treatment	7	14
Lack of different health facilities	7	12
Lack of available TF vaccine	7	8
Lack of government help	7	9
Lack of open communication	6	7
Mistrust in big city hospital	5	10
Diet modification	5	8
Life of a laborer	5	8
Multiple episodes of TF	5	7
Religious/ spiritual healing	4	14
Unfounded fears	4	9
Typhoid complication	3	11
Lack of transportation	3	5
Hearsay belief	3	4
Self-medication	2	5

After deductive coding of all transcripts, I formulated a table by putting the participants' words on the left side and codes on the right side. Themes started to emerge when codes were grouped together and were organized according to the participant's answers. These themes gave information about a pattern. The identified themes emerged

regardless of the assumptions (Creswell, 2014). The relationship between research questions, codes and themes is displayed in Table 3.

Table 3

Code to Theme Conversion by Research Question

Research question		Code	Theme
1.	What are the attitudes and beliefs regarding TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?	Ignorance	Ignorance and mistrust
		Mistrust in big city government hospitals	
		Hearsay belief	
		Unfounded fears	
		Local fever treatments	Local practices
		Religious/spiritual healers	
		Hygiene	
		Diet modification	
		Clean water intake	
		Clean environment	
		Vaccination	
		Low-cost treatment	Faith in biomedicine
		Faith in TF testing	
		Belief in IV medication	
2.	What are the perceived sociocultural barriers related to TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?	Lack of different health facilities	Obstacles to treatment and medical services
		Lack of available TF vaccine	
		Ineffective TF treatment	
		Clean safe drinking water	Environmental barriers
		Lack of transportation	
		Lack of sanitation	
		Life of a laborer	Life constraints
		Lack of funds	
		Lack of government help	
3.	What factors impact the decision-making process related to TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan.	TF spread in area	Perception of risk
		Multiple episodes of TF	
		Lack of open communication	
		Prolonged sickness	
		Complications of TF	
		Suffering	Gender issues
		Home bound women	
		Lack of confidence	
		Subordination	
		Low education	

Table 4 explains the TF experiences faced by women, and the frequency of experiences. I learned that some of the women suffered TF twice in one year. It was alarming to see that TF was so common, and so many women suffered from the disease. It showed that there were multiple factors impacting TF spread in the area. Either the treatment was ignored, defective, or women did not care for their hygiene, cleanliness, and safe food/water intake. Codes and themes were reviewed more closely to look for other reasons for rampant spread of TF.

Table 4

Experience of TF and Frequency of TF Among Women of Gujranwala, Pakistan

Participant	TF experience	Frequency of TF in participant
Aa	Self, one acquaintance woman	One episode 3 years ago that lasted 1.5 months
Bb	Self	1 year ago, one episode lasted 2 months
Cc	Self	2 years ago, one episode
Dd	Self	One episode 3 years back
Ee	Self, sister-in-law	Twice in last 2 years during summer and lasted 3 months
Ff	Self	One episode 2 years back lasted 2 months
Gg	Self	Two times; first episode lasted 3 months, and second episode lasted 6 months
Hh	Self, 6 neighboring women in street	One episode 5 years ago that lasted for 4 months
Jj	Self	One episode 2 years ago
Kk	Self, mother, sister, mother-in-law, 2 sisters-in-law, one niece, 15 neighboring individuals in the street and many more living far away	Self 2 years ago; three times in 1 year. Last year TF lasted for 1 year and still off and on

Results

All codes and themes reflect the responses given by participants. While exact quotes were difficult to maintain because interviews were translated, an attempt was made to express the views and answers of participants within the English translation. This

section describes details about codes and themes that were revealed by the data to answer the following research questions:

RQ1: What are the attitudes and beliefs regarding TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?

Ignorance and Mistrust

The first theme mentioned in Table 3 is ignorance and mistrust. The interviews revealed that many of the participants had bad experiences with big city hospitals that made them afraid and shook up their trust. Many women had no knowledge about diseases in general, which made them ignorant, weak, and fearful about dealing with TF disease. Participants believed whatever other people told them and relied on hearsay information due to their ignorance. The codes associated with ignorance and mistrust were: (a) ignorance, (b) mistrust in big city government hospitals, (c) hearsay, and (d) unfounded fears.

Ignorance

People who lived in low socioeconomic areas of Gujranwala, Pakistan did not have enough money to educate themselves. Most of them were laborers and lived on daily wages. When questions were asked about the causes of TF and measures to prevent TF, participants did not reply confidently because they were unaware and had little knowledge about TF.

Participants Aa, Cc, Dd, Jj, and Kk did not know the exact cause of TF. Participant Aa also did not know what medication was administered to her by the local or

city doctor. Participants Aa, Cc, Dd, Gg, and Hh had no idea about the existence of a TF vaccine. Participants Bb, Cc, Dd, and Kk did not know for sure how they contracted TF. Participants Aa, Dd, and Kk stated they did not know how TF spread in the area and what methods could control it. Participant Bb stated that she suffered from TF due to lethargy and too much work, and she consumed hot liquids for relief. Participant Jj said she did not know the preventive measures for TF. Participant Kk said she did not know about TF vaccine. Participant Kk was unaware about the complications of TF. Hence, participants Aa, Cc, Dd, Ee, Ff, Hh, Jj, and Kk clearly explained their ignorance and lack of information about the disease.

Mistrust in Big City Hospitals

There are government hospitals, which are free, or tertiary care hospitals in the city outside of the study area, but none of the participants visited them freely. Participant Aa narrated how traveling was difficult and then standing in a long queue for all day seemed hard for her. The doctors only worked from 8:00 am till 2:00pm, after that one had to visit the emergency room, so it was not a good option for her to visit the big city (free) government hospitals or tertiary care hospitals. Participant Aa stated all the difficulties regarding time frame and expense for poor individuals to approach a consultant or professor level doctor in the city hospital. Participant Aa opted for local doctor first, but the treatment she received did not work and she stayed sick. Then she went to see a private doctor in the city and got the treatment after getting tested for TF, which was positive. Participant Aa refused to get herself admitted in the hospital due to lack of funds and took all her medication at home.

Participant Hh said despite contracting TF twice in one year, she never went to a big city hospital because she was unable to afford an expensive treatment. Participant Jj said that she was admitted for 15–20 days in government city hospital for TF treatment and she observed that the doctor's behavior was different when nurses and doctors wanted to discharge her after 14 days of TF treatment, which she did not like. Participant Kk said although she suffered from TF, she never chose the hospital as a viable option.

All participants' narratives revealed that they did not trust big city, free government hospitals. These well-equipped hospitals provide free TF treatment. All senior and junior doctors work 24 hours per day and 365 days a year. Senior consultant-level doctors often work from 7 a.m. until 2 p.m. These doctors follow strict rules, and the participants were not happy about it.

Hearsay

Individuals living in this area usually believed one another, and often relied on hearsay to treat symptoms of TF. Participant Aa advised a sick lady that if fever is persistent for a long time, she must get yourself tested for TF. Participant Ee stated that she was sure about TF vaccine availability in the local dispensary and would like for everyone to get inoculated on availability. On the contrary when I asked her indirectly to confirm how many individuals in the area were inoculated with TF vaccine, she had no answer. Participant Kk said that the local dispensary doctor who administered her intravenous (IV) medication told her that TF germs are present in the body and TF is not contagious. The statements from the Participants, Aa, Dd, Ee, Hh, and Kk showed that people believe each other without confirming the information.

Unfounded Fears

Several participants expressed unfounded fears about TF disease that are worth noting. Participant Kk believed that TF can convert into Hepatitis C and then cancer and then death occurs. Participant Kk said she was afraid that the germ of TF lived in the human body all the time and was non-transferable. Participant Kk also said she thought she got TF due to fatigue and overwork; she also believed that the summer season caused TF. These narratives showed that participants had unfounded fears and they were unaware that TF is a treatable and preventable infectious disease.

Local Practices

The second theme demonstrated local customs and practices of the individuals who lived in low socioeconomic areas. The attitudes and behaviors of women who experienced TF was noted because it showed how they combat diseases and why TF spread still prevailed in these areas. This theme consists of the following six codes: (a) local fever treatments, (b) religious/spiritual healers (c) hygiene, (d) diet modification, (e) clean water intake, and (f) clean environment.

Local Fever Treatments

During the interviews, participants described small dispensaries and hospitals in the local area that were not equipped to handle serious diseases. Pharmacists, dispensers, and doctors provided simple medication for fever, cold, flu, first-aid medicines, and vitamins. No aggressive and long-term treatments were offered. Participants Aa, Ff, Gg, and Kk stated that they took local doctor's treatments, but their fever never subsided. Participants Bb and Cc took medication from a local doctor and followed a course of

treatment until they felt better. Participants Dd, Hh, and Kk stated they went to a local doctor for testing and treatment of TF. Participant Ee said she went to a local doctor for TF testing, took medication three times in 2 years, and eventually got better. Participants Aa, Bb, Cc, Dd, Ff, Gg, Hh, and Kk narrated their stories of treatments when they suffered from TF and kept visiting their local medical dispensary for treatment.

Religious/Spiritual Healer

When I asked questions about TF treatment, many participants narrated stories about how they tried to find relief from religious healers. Participant Bb believed in amulets given by a religious leader and in drinking holy water as a treatment for fever. Participant Dd believed in religious healers, and she also took holy water to relieve her TF disease. Participant Ff stated that she believed in religious healing, so she took some dates and holy water from the religious leader in the area. Participant Hh stated that she switched between religious healer treatment (i.e., Dum/ phook) and medication, which involved 1 month of medication and 1 month of religious treatment. Participants Bb, Dd, Ff, and Hh took religious treatments first, as they had faith in them.

Hygiene

Almost all participants knew about the importance of good hygiene. Participants Aa, Bb, Cc, Ee, Ff, Gg, HH, and Kk said they followed a hand washing routine. Participants Aa, Bb, Dd, Ee, Ff, and Gg believed cleanliness is necessary to keep diseases away. Participant Aa stated that her doctor advised her to take extra care for cleanliness and personal hygiene. Participants Bb, Cc, Ee, Gg, and Hh said they endorsed frequent hand washing with soap and water before meals and after toilet use. Participant Dd

believed in teeth brushing and frequent hand washing. Participant Kk said in the summertime she washed her hands frequently for 25 seconds and washed hands twice after using bathroom.

Participants Aa, Bb, Ff, and Kk also mentioned that they only used washed and clean dishes. Participants Aa and Ff both stated that they wash vegetables before cooking. Participants Aa and Bb said that their children also follow hygiene rules. Participants Cc, Ee, and Ff said they do not share or eat food from the same plate as others. Participant Cc has a one-year-old child, and she washed his hands and her own hands before each meal. Participant Dd believed in hand washing, brushing teeth, and keeping clothes and bedding washed and tidy. Comments from participants Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, and Kk showed preventive habits that everyone knows well, and they made sure that every housemate follow these habits too.

Diet Modification

Most participants mentioned changing their diet to treat TF. Participant Aa consumed carrot juice on the advice of a doctor who was treating her. Participant Bb stated that she started drinking hot liquids as treatment for the fever and body aches and pains (i.e., hot green tea, hot milk, and hot water). Participants Cc and Ff started using filtered water after TF sickness. Participant Kk said she only consumed a soft diet like soft bread, liquids, and rice after she contracted TF. Participant Kk stopped eating from outside markets and street hawkers. Moreover, participants Aa, Bb, Dd, Ff, Hh, and Kk said that they used diet modification before seeking medical treatment for TF.

Clean Water Intake

I asked if safe, clean drinking water played some role in preventing diseases. Participants Aa, Ee, Gg, and Hh stated a belief that dirty water in the area was the cause of diseases. Participant Aa filled a clean water bucket, covered it, and used this water all day. Participants Bb, Cc, Dd, Ee, Ff, and Gg stated that they use filtered water because the water in their area had gone bad. Participant Gg said they bring filtered water from outside to avoid diseases. Participant Hh said she was forced to drink dirty water because no one could fetch clean filtered water for her. Participant Kk said that she switched to boiled water intake after she contracted TF.

Clean Environment

I asked questions about the importance of cleanliness and sanitation in controlling disease spread. Participants Bb, Cc, Dd, Ee, Ff, Gg, Hh, and Kk believed in cleanliness of their surroundings. Participants Aa and Hh complained about open drains filled with filth and litter all around the area. Participants Aa, Dd, Ee, and Ff stated they also believed that litter and garbage, which is laying around their area was the culprit for diseases. Participants Aa and Cc stated they enforced cleanliness in the street outside their houses. Participant Bb explained how she cleaned her house and washed her house courtyard with Dettol or soapy water. Participant Ee cleaned her house and sprinkled phenyl to kill germs. Participants Gg and Hh said they kept their houses clean all the time. Participant Kk said that she believed in cleanliness, bathing, clean dishes, but she did not understand why she stayed sick, and why her TF testing showed a positive result every time. Participants Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, and Kk believed in environmental cleanliness and tried their best to maintain it.

Faith in Biomedicine

Women living in low socioeconomic areas in Gujranwala also believed in biomedicine, even though they did not have money to spend on medicines and consulting doctors. This theme included four important codes, which were: (a) vaccination, (b) low-cost treatment, (c) faith in TF testing, and (d) belief in IV medication.

Vaccination

I asked participants questions regarding TF prevention modalities and the typhoid fever vaccine. Participants Aa, Bb, Cc, and Ee believed in the TF vaccine. Participant Dd stated she wanted to learn more about the TF vaccine through written material. Participant Ff believed that she received the TF vaccine as a child. Participant Gg wanted to opt for the TF vaccine. Participant Kk believed that she was vaccinated. These responses indicated that participants did not have complete knowledge of the TF vaccine or vaccination process.

Low-Cost Treatment

I asked what treatments participants took for TF. All the answers of participants revolved around low-cost treatments. Participant Aa went to a local doctor for fever treatment (instead of getting different screening tests) so that she could save money, and it was all in vain because her fever never subsided. Participants Aa, Cc, Dd, Gg, Hh, and Kk stated that they went to a low-cost local doctor and received IV drips and medication for relief of fever. Participants Cc, Dd, and Kk also went to a local doctor for TF testing. Participant Kk said she got her TF tests and TF treatment from a local doctor. Participants

Aa, Cc, Dd, Hh, and Kk preferred low-cost TF tests first and then treatments. These participants either did not have enough money or they did not spend it on health issues.

Faith in TF Testing

Almost every participant reported that they underwent TF testing, whether it was done locally or in city hospitals. Participants Aa and Ee both went to the city hospital when they had a fever and they were tested there for TF, which they believed was the final clue. Participant Aa and Ee took all their prescribed TF medication and then got tested for TF; it came out negative and they believed that this is a good way to screen for TF. Participant Aa also advised a TF screening test for her female neighbor as her fever was not subsiding. Participants Bb, Cc, Dd, Ee, Ff, Gg, Jj, and Kk got their TF test done when they suffered from fever and believed that was how they were diagnosed with TF. Participant Gg said that she went for TF testing before each episode to confirm TF disease. Participant Hh stated that she was screened twice for TF, and the result was positive both times. Participant Kk said she opted for TF testing three times before and several times after TF treatment; it always showed positive result. All 10 participants believed in TF testing to confirm if they were suffering from TF or not.

Belief in IV Medication

Nine out of 10 participants replied to questions about treatments and felt better when received intravenous (IV) medication or fluids. Participants Aa and Dd received IV medication at the city hospital. Participants Bb and Cc stated they received IV drips before and after a TF positive test, which relieved their TF. Participants Ee, Ff, Gg, Hh, and Jj said that they received repeated IV medication and fluids, which cured their TF.

Participant Kk said that she did not believe in IV medication and always took oral medication. Participants Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, and Jj believed in IV medication for TF treatment.

RQ2: What are the perceived sociocultural barriers related to TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?

Obstacles to Treatment and Medical Services

The first theme related to research question 2 was about the complaints participants made regarding obstacles for treatment and medical services. This theme included four codes: (a) lack of different health facilities; (b) lack of available TF vaccine, (c) ineffective TF medication, and (d) TF spread in the area.

Lack of Different Health Facilities

Almost every participant described difficulties in obtaining high quality treatment due to lack of different health facilities in the area. Participants Aa and Kk did not get better with local doctor treatment, and they had no other health facility to visit for their fever problem. Participants Bb, Cc, Dd, and Ee said there was no other health facility other than a local dispensary and a local doctor, and they all went to him for their treatment. Participant Ff went to her uncle, who was a doctor/physician, to get treatment for TF because the local doctor's treatment was not effective. Participants had no other place than the local dispensary, and they kept on visiting it because they lacked options.

Lack of Available TF Vaccine

I asked if participants knew about the TF vaccine and their views it. Participant Aa did not know about the TF vaccine because it was not available in her area. Participants Bb stated the unavailability of the TF vaccine in her area, and that is why her children did not receive it. Participant Cc stated that she believed in the TF vaccine and wanted her child to get vaccinated upon availability. Participants Dd, Gg, and Hh said they did not know about TF vaccine existence. Almost all 10 participants mentioned lack of available TF vaccine in their area.

Ineffective TF Treatment

When asked about TF treatments, participants narrated stories of how difficult it was to treat TF in their area. Participants Aa and Gg took local doctor medicine for their fever, and they never felt better. Participants Bb and Cc received TF treatment from their doctor and recovered after two long treatments of medication. Participant Dd recovered after taking medication for three weeks. Participant Ee explained that she took TF treatment medication from a local doctor three times in two years, and then she recovered. Participant Ff took fever treatment from the local dispensary, but her fever was not relieved; then she took TF medication off and on for three months and felt better. Participant Gg said that she took TF medication twice for a three-month period each time. Participant Hh said she took TF medication treatment twice in one year, but her TF test result was never negative. Participant Kk said that she was treated with oral medication three times for two months each time, but she never felt better and stayed sick with fever and fatigue. All 10 participants took TF treatment medication from local doctors and

never found relief, and some of the patients had to travel out of the area to get TF treatment for a longer time. It indicated that TF medication was ineffective.

Environmental Barriers

Participants believed they were deprived of certain resources which were available to the city people. This second theme comprised of: (a) clean safe drinking water, (b) lack of sanitation, and (c) lack of transportation.

Clean Safe Drinking Water

I asked a question about the role of sanitation in diseases. Participants themselves started to inform me about unclean, unsafe drinking water in their area. Participants Bb and Cc complained about the water contamination in their area and many other individuals also preferred filtered water. Participants Dd, Ee, and Hh said that there was no water filtration system in their area, and they had to travel far to get filtered water in bottles. Participants Dd, Ee, Ff, and Gg stated diseases spread due to unclean, unsafe, and dirty water in the area. These participants used filtered water in their homes. Participant Hh stated that she had to ask her husband to fetch clean filtered water for her as the water filtration system was installed outside the area where she lived. Participant Kk used boiled water. Participant Aa, Bb, Cc, Dd and Ee stated that they travelled outside their areas for filtered water. Participants Ff, Gg, and Hh stated that tap water caused diseases in their area. Participant Gg believed in the collective effort of village/area individuals to convince the government for installation of a water filter plant in their area. Almost all participants complained about the bad quality of water in their area.

Lack of Sanitation

When I asked questions about sanitation in the area, almost every participant complained of litter and garbage lying around the area. Participant Cc complained about litter outside houses. Participants Aa, Dd, Ee, Ff, and Hh stated there was litter and garbage laying around in their area. Participants Aa and Hh complained about open drains with filth outside and around their house. Participants Gg and Hh believed in a clean sanitized environment for prevention of diseases. Participants Aa, Cc, Dd, Ee, Ff, Gg, and Hh clearly explained that their area lacked sanitation.

Lack of Transportation

When I asked questions about availability of TF treatments, several participants complained about the inefficient transportation system in the area. It showed that it was difficult to travel from their homes to medical treatment facilities. Participant Aa mentioned in detail that transport from their area to the city had no specific timings and fare amount. Transportation often reached late at destinations, and cost more than expected. Participants Aa, Hh, and Kk did not trust local transportation. Other participants never used it.

When I asked participants about their methods of treating fever, they all complained about distant health facilities that required dependable transportation to reach. Participant Aa said it took 15 days before she went to the hospital with her husband because there was no dependable transportation available. Participant Hh asked her husband to fetch filtered water for home because he himself drove a donkey cart. Participants had no reliable means of local transportation due to lack of money, lack of courage to leave the house alone, and unreliable transportation.

Life Constraints

The third theme represents sociocultural limitations related to the low socioeconomic status of participants. These life constraints consisted of three codes: (a) life of a laborer; (b) lack of funds; (c) lack of government assistance.

Life of a Laborer

Almost every participant talked about how the life of a laborer impacted the risk for TF and the ability to obtain timely TF treatment. Participant Aa depends on her husband who drives a donkey carriage as a laborer. Participant Cc depends on her husband for everything. Participant Hh stated that her laborer husband had limited funds and was unable to afford expensive and lengthy TF treatment or city hospital medication. Participant Ee explained that she was sick with fever for 5 days with body aches and pains until her husband took her to local doctor. When the fever medication did not work for a few days, her husband finally took her to the city hospital for TF testing and treatment, which took almost 1 month. Participant Kk always took local doctor medication and used boiled water, because her husband had no time for the city hospital visit or to get filtered water for her. Participants' stories showed the difficulties related to living with a laborer.

Lack of Funds

Nearly every participant talked about how they budgeted and managed their disease treatments. Participants Aa and Hh mentioned that their laborer husbands had no money to spend on transportation to the city and costly health facilities or expensive TF treatments. Participants Bb and Kk went to the local dispensary three times for cost-

effective fever management. Participant Cc wished for a vaccine availability over expensive TF treatments. Participant Ee stated she had spent money many times to get TF treatment. Participant Ff stated she took treatment from her uncle who was a doctor in the area to save money. Participant Hh complained multiple times about the high cost for TF treatment.

Lack of Government Assistance

Participants gave different answers to questions about area cleanliness, and all views pointed towards a lack of interest from the government in their area. Participant Aa expressed her views about the low sanitation level, and no one from the government ever took care of her street cleanliness. Participants Cc, Ee, and Hh said the government should supply TF medication, vaccines, clean filter water for homes, and help in area cleanliness and sanitation. Participants Ff and Hh stated there was litter around the area. Additionally, participants Aa, Ff, and Gg, also said that government must help them with their issues of filtered water system installation and area cleanliness.

RQ3: What factors impact the decision-making process related to TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?

Perception of Risk

Participants' views and attitudes about TF were related to real perceptions of risk due to multiple and long episodes of illness. The first theme included the following codes: (a) TF spread in area, (b) multiple episodes of TF, (c) lack of open communication, (d) prolonged sickness, and (e) complications of TF.

TF Spread in Area

When I asked questions about controlling TF in the area, almost all participants stated that unclean, unsafe water, and litter could be the culprit of TF spread. Participant Aa believed her neighbor was suffering from TF. Participants Bb, Dd, and Ee stated that they believed TF spread in their locality. Participant Cc stated that every other individual suffered from TF in her area. Participants Ee and Gg said their sisters-in-law also contracted TF. Participant Ff stated that despite her warning, she noticed her neighbors used tap water, and they could have suffered from TF as the disease was rampant in the area. Participant Hh stated that six more women in her street suffered from TF disease. Participant Kk stated that her mother, her sister, her two sisters-in-law all contracted TF, and 15 more individuals living in her street suffered from TF; that was enough to gauge TF spread in her area. Participants Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, and Kk described myriad reports of people suffering from a persistent fever, which was a strong indicator of rampant TF spread in the area.

Multiple Episodes of TF

I asked all participants how many times they contracted TF, and to my surprise, almost everyone had more than one episode. Participant Bb took medication off and on for two months and got better. Participant Ee stated that she contracted TF three times in the last two years. Participant Gg suffered TF twice, and it was confirmed by TF test. Participant Hh suffered two TF episodes in one year, they lasted four months, and she still tests positive for TF. Participant Kk said she was positive for TF three times, and she

took medication for two months three times and did not get better. Participant Kk said she always showed positive result for TF test.

Lack of Open Communication

I asked participants if they told anyone about their sickness and how they communicated with others regarding their illness. All participants had different ways of expression. Participant Aa expressed she never inquired about the causes of TF, its prevention, and whether TF vaccine is available in their hospital. Participant Bb did not initially openly inform her family that she was having fever, body aches, and pains and suffered sickness for three continuous days. Participants Bb, Cc, Dd, and Ee went to the local doctor but never asked about preventive measures for TF. Participant Hh stated she did not disturb her husband because he had to work very hard as a laborer; she remained sick with fever for almost 15 days until her husband noticed she could not work around the house, so he took her to the local doctor. Participant Kk said she never felt better with local doctor TF treatments. She said she never went to big city hospitals and never opted to get admitted in the hospital for TF treatment; on the contrary she kept changing her physicians. Participants Aa, Bb, Cc, Dd, Ee, Hh, and Kk withheld information about their sickness due to unknown fears of expenditure, ignorance, or laziness.

Prolonged Sickness

Almost every participant stated that the length of their sickness was in months and years e.g., two to four months or sometimes up to two years or more. Participant Aa remained sick for approximately one and a half months. Participant Bb suffered with TF for two months. Participant Cc said she was sick for a very long time. Participant

remained sick for three weeks. Participant Ee suffered from TF three times in two years for four months every time. Participant Ff said she remained sick with TF for three months. Participant Gg stated that she suffered from TF twice and each time for three months. Participant Hh stated she suffered from TF twice and remained sick for four months each time in one year. Participant Jj stated she was admitted in the hospital by her mother and received iv medication for 15–20 days and got better. Participant Kk said she contracted TF two years ago, tested positive three times, took TF treatment medication for two months each time, and still feels sick with fever. Hence participants Aa, Bb, Cc, Ff, Gg, Hh, Jj, and Kk complained that they suffered from sickness for a long time.

Complications of TF

I asked participants if they knew the complications of TF diseases. They all replied that they did experience it. After taking medication for two months, Participant Bb noticed that she developed piles (hemorrhoids). Participant Hh contracted TF twice in one year and her TF test is still positive. Participant Kk said she experienced TF two years ago and took oral medication three times. She developed acidity in the stomach, burning micturition (urinary incontinence), and her fever never subsided completely. Participants Bb, Hh, and Kk said they were sure that they had experienced TF complications because their digestive system was no longer as good as it was before the sickness.

Gender Issues

Women are the participants of this study, and they described cultural beliefs related to gender that impacted their ability to prevent and treat TF. This second theme

had five codes, which included: (a) suffering, (b) home-bound women, (c) lack of confidence, (d) subordination, and (e) low education.

Suffering

When participants Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, Jj, and Kk narrated their stories of TF illness, they described the hardships of living in low socioeconomic areas with fewer facilities, non-availability of filtered water, lack of transportation, and unclean and unsanitary environmental conditions. Almost all women complained of only one dispensary and no trained doctor available to treat TF in the area. Married women participants' husbands were primarily laborers and managed their lives with low monetary funds to meet both ends. Lack of money steered them to choose home remedies and religious/spiritual treatments. These rituals prolonged their disease suffering. Lack of awareness confused them, and these women felt compelled to believe others. The complications from TF disease made them realize the importance of filtered water and hygiene habits, and they adopted them as preventive steps. Every participant had stories of different kinds of suffering regarding insufficient funds, living style, lack of freedom to choose TF treatments, and prolonged disease suffering.

Home Bound Women

All 10 participants were asked if they were available for the interview session and alone in a room for 60 minutes. Almost everyone replied that they did not work outside their homes. Participants Aa, Bb, Cc, Dd, and Ee were stay-at-home mothers with children, and did not work outside the home. Participants Gg, Hh, and Jj stated they mostly stayed home. All participants did not have any job outside the home. Only one

participant was a student, so she attended her school in the morning and participated in the interview session in her free evening time.

Lack of Confidence

I asked how important it was to their family if a woman had some of her own views about TF treatment, and almost everyone showed a lack of confidence. Participants Aa, Bb, and Cc showed a lack of initiative and confidence in taking treatment and going to the doctor right away by themself. Participant Aa did not go alone anywhere. Participant Dd did things according to her husband's or mother-in-law's directive. Participant Ee stated she never went alone anywhere even to the local dispensary, and she tags along with her family members whenever she was outside her house. Participant Hh said she never left her house and brought clean filtered water from outside her area. Participant Hh said that her husband never fetched filtered water for her in the house because he did not listen to her. Participant Jj depended upon her mother and took less initiative moving in society. Participant Kk said she never went against her family's will, always went to the local doctor for treatment, and never opted to get herself admitted to the hospital for TF treatment. Participants Aa, Bb, Cc, Dd, Ee, Hh, Jj, and Kk showed dependency on other family members.

Subordination

I asked questions about deciding on treatment when participants faced symptoms of TF, and all participant women lacked any independent decision-making power. Participant Aa believed in listening to her husband and doing whatever he planned for her to do. Participant Bb listened to her mother-in-law first. Participant Cc said her opinion

was number two in the house. Participant Dd said she listened and gave prime importance to her husband's and her mother-in-law's opinion in all matters. Participant Ff stated that in her surrounding area households, almost all women were ignored because their husband's voice prevailed. Participant Gg lived with five other female family members, so she stated they tend to consult among themselves and listened to each other's problems and helped each other to overcome diseases. Participant Hh stated her husband never listened to her. Participant Jj described a dependency on her mother. Participant Jj also said she believed that Pakistan has a male chauvinistic society and females are given the second voice; however, now with the spread of education, men's behavior could change in future. Participant Kk always put her mother-in-law first and obeyed all her decisions, even in her own diseased situation. All participants showed subordination to elders in the family.

Low Education

Participant women in this study showed low knowledge and awareness of health issues. Participant Aa did not know the name of medication and how many she took. Participant Aa and Dd said they did not know about TF vaccine, what factors cause TF, and how they could prevent TF spread in the area. Participants Bb and Cc did not know about vaccine availability, what factors cause TF, and how they contracted TF. Participants Ee and Hh said they did not know about TF vaccine. Participant Jj stated she was unaware of the cause of TF, its spread, its complications, and even TF vaccine availability. Participant Jj stated she knew that TF spread via contaminated food and unclean water intake. Participant Kk said she believed that the TF germ stayed in the

body and that is why she remained sick all the time. Participant Kk said she believed TF disease is non-transmissible, but she also acknowledged that you can get the disease by sharing food with a TF patient. Participant Kk believed that TF converts into hepatitis C and cancer, which could lead to death.

Table 5 provides a summary of results and how themes and codes were organized.

Table 5

Summary of Results

Theme	Code	Selected answers from participants
Ignorance and Mistrust	Ignorance	Aa, Cc, Dd, Jj & Kk: Do not know the cause of TF disease. Aa, Cc, Dd, Gg, Hh & Jj: Do not know about TF vaccine existence.
	Mistrust in big city government hospital	Aa: Difficult to travel and stand in long queue to wait; sometimes doctors time is up so no use visiting big city hospitals. Aa, Bb, Cc, Dd, Ee, Ff, Gg & Hh: Took treatment from local doctor.
	Hearsay belief	Aa: Advised neighbor to opt for TF testing. Ee: Believe availability of TF vaccine in local dispensary. Kk: Believe TF germs stay in the body and TF is not contagious.
	Unfounded fears	Kk: Thinks TF can become hepatitis C and cancer.
Local practice	Local fever treatment	Aa, Ff, Gg, Kk & Jj: Local doctor treatment did not help fever. Bb & Cc: Received fever treatment plus TF course treatment. Dd, Ee, Hh & Kk: Went to local doctor for TF testing and TF treatment.
	Religious/spiritual healers	Bb: Wears amulet and uses holy water after fever. Ff: Used holy dates and holy water. Hh: Switched fever treatment between medication and religious healing each month until she got better.
	Hygiene	Aa, Bb, Cc, Ee, Ff, Gg, Hh, Jj & Kk: Follow hand hygiene (hand washing before meals and after toilet use). Aa, Bb, Ff & Kk: Eat on washed and clean dishes. Aa & Ff: Wash vegetables before cooking. Aa & Bb: Children follow hand wash rule.

Themes	Codes	Selected answers from participants
	Diet modification	Aa: Carrot juice. Bb: Hot liquids (e.g., milk, green tea, water). Cc & Ff: Filtered water. Kk: Boiled water and stopped eating food from outside.
	Clean water intake	Aa: Fill a bucket daily with clean water and cover it. Bb, Cc, Dd, Ee, Ff, Gg & Jj: Drink filtered water.
	Clean environment	Bb, Cc, Ee, Ff & Hh: Cleanliness of surroundings required. Aa & Hh: Complaint of open drain filled with filth and litter outside home. Aa, Dd, Ee & Ff: Noticed litter and garbage lying around the area.
Faith in biomedicine	Vaccination	Aa, Bb, Cc & Ee: Wanted their children vaccinated. Dd: Wanted to read about TF vaccine from written material/ pamphlet. Ff & Kk: Believed she had TF vaccine as a child. Gg: Would get the TF vaccine whenever available.
	Low-cost treatment	Aa, Cc, Dd, Gg, Hh & Kk: Went to local doctor for TF testing and TF treatment. Bb: Tried hot liquids first for fever and fatigue. Kk: Always took oral medication for TF treatment.
	Faith in TF testing	Ae & Ee: Believe TF testing is good way to screen for disease. Bb, Cc, Dd, Ee, Ff, Gg, Jj, and Kk: Got TF test when they suffered from fever and believed that was how they were diagnosed with TF.
	Belief in IV medication	Aa & Dd: Received IV medication at the city hospital. Bb & Cc: Received IV drips before and after a TF positive test, which relieved their TF. Ee, Ff, Gg, Hh, & Jj: Received repeated IV medication and fluids, which cured their TF. Kk: Did not believe in IV medication and always took oral medication.

Themes	Code	Selected answers from participants
Obstacles to treatment and medical services	Lack of different health facilities	Aa, Ff & Kk: Local doctor TF did not work, and they had no other health facility choice in area. Bb, Cc, Dd & Ee: Only local dispensary available.
	Lack of available TF vaccine	Aa: Unaware of the TF vaccine. Bb, Cc & Ee: TF vaccine was not available in area. Dd, Gg & Hh: Did not know if TF vaccine existed.
	Ineffective TF treatment	Aa, Bb, Cc, Ee, Ff, Gg, Hh, Jj & Kk: Local doctor treatment did not work. Dd: Recovered after 3 months TF treatment. Ee: Received TF treatment 3 times in 2 years. Ff: Received TF treatment off and on for 3 months and then felt better. Gg: Received TF treatment twice in 3 months. Hh: Received TF treatment twice in one year but still sick. Kk: Received 2-month treatment for 3 times and was still sick at the time of interview.
Environmental barriers	Clean safe drinking water	Dd, Ee, Ff, Gg: Believe that unclean dirty water is the culprit of TF spread in the area. Bb, Cc, Dd. Ff: Used filtered water to avoid diseases. Dd, Ee, Hh: Traveled outside area to fetch filtered water for home.
	Lack of transportation	Aa: Waited for 15 days with fever for her husband to take her to hospital. Ff: Went to her uncle who is a local doctor for TF treatment. Kk: Never went to city hospital for treatment.
	Lack of sanitation	Aa, Bb, Dd, Ee, Ff & Hh: Noted litter and garbage lying around outside in area. Gg, Hh & Kk: Stated clean sanitized and hygienic environment could keep diseases controlled.

Themes	Codes	Selected answers from participants
Life constraints	Life of a laborer	Aa: Laborer husband drove donkey and carriage and she waited for 15 days with fever till he took her to city hospital. Cc & Hh: Waited for their laborer husband for each trip to hospital. Ee: Waited for her laborer husband for every doctor trip. Kk: Always went to local doctor and her laborer husband had no time to fetch her filter water.
	Lack of funds	Aa: Could not spend money on transportation and costly TF treatment. Bb & Kk: Chose low-cost local doctor treatment.
	Lack of government assistance	Aa, Cc, Ee, Ff & Hh: Blamed government for unclean environment. Cc, Ee & Hh: Said that government must supply TF vaccine and filtered water in the area. Dd, Ee, Gg & Hh: Said government must install filtration water plant in the area.
Perception of risk	TF spread in area	Aa: Advised sick neighbor for TF testing. Bb, Dd & Ee: Agreed to TF spread in area. Cc: Reported every other person sick with TF in the area. Ee & Gg: Sister-in-law is suffering from TF. Ff: Neighbor used tap water and suffered TF. Hh: 6 people in her street suffered TF. Kk: Mother, sister, sister-in-law daughter, and 3 sisters-in-law suffered from TF. Moreover 15 people altogether in her relatives, acquaintance and in the street suffered from TF.
	Multiple episodes of TF	Ee: Suffered TF 3 times in 2 years. Gg: Suffered TF twice. Hh: Suffered TF twice and TF test still positive Kk: Suffered TF 3 times but still sick with positive TF test result.
	Self- medication	Ee: Purchased fever, cold, flu medication from local dispensary. Jj: Purchased fever medication from local dispensary for 5 days.
	Lack of open communication	

Themes	Codes	Aa: Never asked doctor about her medication.
		Selected answers from participants
		Bb: Did not tell her family about fever for 5 days. Bb, Cc, Dd & Ee: Never asked TF preventive measures from doctors. Hh: Never disclosed her sickness till her husband realized that she could not work due to fever.
	Prolonged sickness	Aa: Remained sick for 1.5 months. Bb: Remained sick for 2 months. Cc: Remained sick for a very long time. Dd: Remained sick for 3 weeks. Ee: Suffered TF 3 times in 2 years and each time remained sick for 4 months. Ff: Remained sick for 3 months. Gg: Suffered TF twice for 3 months each time. Hh: Suffered TF twice in one year & was TF positive whenever tested. Jj: Remained sick with TF for 25 days. Kk: Suffered TF 3 times, sick for 3 months each time. She was TF positive whenever tested.
	Complications of TF	Bb: Developed piles after 2 months TF medication. Kk: Develop stomach acidity, burning micturition after 3-month TF medication treatment. Hh & Kk: Always showed positive TF test results.
Gender issues	Suffering	Aa, Bb, Cc, Dd, Ee, Ff, Gg, Hh, Jj, & Kk: Suffered from fever and stayed sick for many days trying home remedies, self-medication and visiting dispensary for treatments. They complained about facing hardships of life in low socioeconomic area with very few healthcare facilities and treatment options.
	Home bound women	Aa, Bb, Cc, Dd & Ee: Stay-at-home mothers. Gg, Hh & Jj: Preferred staying home.
	Lack of confidence	Aa, Bb & Cc: Did not visit doctor right away. Did not go alone anywhere. Dd: Obeyed husband and mother-in-law. Hh: Did not go anywhere without husband. Jj: Always needed her mother in society.

Themes	Codes	Selected answers from participants
		Kk: Never went out without her family members.
	Subordination	Aa, Ee & Hh: Showed dependency on husbands. Bb & Kk: Listened to mother-in-law first. Cc: Said her voice is number two. Dd: Listened to husband and mother-in-law first. Ff: Admitted that in her area everyone listened to their husbands first. Gg: Followed mutual consensus of 5 women at home. Jj: Listened to her mother.
	Low education	AA: Was not aware of medication names and did not know how she contracted TF. Aa, Dd & Gg: Did not know about TF vaccine and how to prevent TF spread in the area. Hh: Kept switching between religious treatment and doctor treatment. Bb & Cc: Did not know the causative factors for TF, how they contracted TF, and unaware of TF vaccine. Gg: Needed questions repeated due to poor understanding of concepts.

Evidence of Trustworthiness

Trustworthiness in qualitative research provides necessary rigor and shows confidence in data, interpretation, and methods used to ensure quality (Connelly, 2016). All research studies must deliver value, applicability, consistency, and neutrality to be considered worthwhile (Amankwaa, 2016). This research study carries all these values to ensure its trustworthiness. The value of a research study is strengthened by its trustworthiness (Amankwaa, 2016). Qualitative research study involves different subjects and their views which enhance trustworthiness and quality of content in a study.

Credibility

The study's credibility shows truthfulness, and the findings reflect it (Connelly, 2016). Dennard et al. (2021) stated that credibility is met by reviewing the data and the themes deducted. Reader can determine credibility by looking at the relation of themes in comparison to the experiences of others (e.g., general population) in the same context. According to Connelly, prolonged engagement with the participant is essential; iterative questioning and repeatedly asking questions to find the truth can explore the fact. I was unable to live in the targeted area due to the COVID-19 pandemic, during my research study period, but I have lived in the city of Gujranwala from 1979-1989 and again from 2012–2017 and worked as an obstetrician and gynecologist (OBGYN). I am familiar with the place and the culture.

Transferability

A qualitative research study focuses on information from participants and their stories, which are not everyone’s stories but depict their peers' pictures (Connelly, 2016). The researcher explains accurate, rich, detailed, and transparent information about the individuals that it could apply to the reader’s situation or can be generalized to other individuals in the same problem. Also, the vivid picture painted by the researcher based on the findings can resonate with the reader (Connelly, 2016). The participants of this study may have different experiences from others, but women from low socioeconomic areas have similar conditions and share the same problems in developing countries. Hence this research study fulfills transferability to some extent.

Dependability

Dependability criteria depend on whether the findings or results are replicated similarly to those of participants (Dennard et al., 2021). The data collected in Urdu was transcribed and translated in English language and special care was taken to maintain the ideas of participants. I also consulted with a Punjabi translator at a professor level (in the university of Pakistan) to ensure I correctly translated responses in English language. This was in line with IRB requirements as the translator was not part of the data collection or research team. Also, my dissertation chair reviewed my themes and codes. The interviews were audio-recorded and saved in the participant's language. These interviews can be heard by anyone anytime. According to Amankwaa (2016), there is a way to establish dependability by involving another technique called audit inquiry, involving another researcher who is not engaged in the research process and examines both the process and the product. This is to evaluate the accuracy of the findings, interpretation, and conclusion per the data collected (Amankwaa, 2016). In this study, the dissertation chair served as an auditor.

Confirmability

The confirmability and authenticity of this study depended upon the data collected via interviews of the participant's firsthand experiences (see Dennard et al., 2021). Confirmability is analogous with objectivity and the neutrality of the findings are consistent and could be repeated (Connelly, 2016). In this research study, researcher took an objective view and stayed neutral. Interviews were transcribed and translated immediately so as not to lose accuracy of the data. Deductive codes revealed themes

showing an accurate picture of the problems that women living in low socioeconomic areas face regarding TF spread.

Authenticity

Authenticity in a research study is the range of different aspects of a participant's life based on truth and realistic factors revolving around their daily lives (Connelly, 2016). The audio-recorded interviews of participants clearly explain their true lifestyle. A researcher can target the area and select appropriate participants to explain and provide related information and honestly address the issue from the participants' eyes (Connelly, 2016). The true picture of the disease situation in the targeted area was explained by the participants themselves. In this way, the authenticity of the data is represented in the participant's own responses.

Limitations of the Study

One limitation of the study was that the audio-recorded interviews were done in the local language, due to the low literacy rate in the area, and all interviews were translated into English. The researcher also lived in the nearby city area for a long time in the past, and there was a chance of bias due to sympathetic attachment with the study population. Another limitation was potential selection bias as recruitment flyers were posted on the roadside or street and may not have been viewed by everyone living in the target area. To overcome this, the flyer/invitation was also posted and advertised on TikTok and Facebook (social media). There may be chance of missing some people who did not use internet or did not have cell phones. I was unable to do face to face interviews and missed on observing facial expressions and body language, which is an important

part of the interview in qualitative research. Also, due to COVID-19 pandemic, I could not live in the area to develop some relation with the local people and assess their problems better.

Summary

In this chapter, I clearly explained the data collection, data analysis, and results of interviews with 10 females living in low socioeconomic areas of Gujranwala, Pakistan who have experienced TF. In this qualitative data analysis, deductive coding revealed 34 codes and eight themes (see Creswell, 2014). In this chapter, participant responses were used to describe the factors affecting TF spread in the study area, including attitudes, beliefs, behaviors, barriers, resources, and facilities. In Chapter 5, I will conclude with a discussion on the implications for social change and recommendations based on the study findings.

Chapter 5: Discussion, Conclusion, and Recommendation

Introduction

TF spread is uncontrollable in low socioeconomic areas of the world (Ashurst et al., 2021; Fatima et al., 2021; Hussain et al., 2019; Im et al., 2022; Meiring et al., 2021; Voysey et al., 2020). According to Hussain et al. (2019), TF is a substantial worldwide health problem with 21.6 million cases worldwide and 250,000 deaths annually. Almost 90% of TF morbidity and mortality occurs in Asia (Kaljee et al., 2018). About 23% of the South Asian population lives in high-risk areas where water is contaminated and water-borne diseases are common (Kaljee et al., 2018). The TF incidence rate in South Asia is 110 cases/100000 (Hussain et al., 2019). According to Fatima et al. (2021), Pakistan has the highest incidence rate of approximately 493.5 per 100,000 persons/year. Participants in this study were drawn from a low socioeconomic area in Pakistan with high rates of TF.

The targeted area for this qualitative research study has no clean, safe drinking water available. Most of the time, people traveled outside their residential areas to get filtered water for their homes. The participants also complained about unclean and unsanitary environmental conditions. Previous research studies discussed many causative factors for TF, including multiple drug-resistant bacteria, extensively drug-resistant typhoid bacterium, outdated diagnostic modalities, dirty, unsafe drinking water, unsanitary environment, poor sewage system, contaminated food, poor hygiene, and hot, humid climate. (Butt et al., 2022; Fatima et al., 2021; Garrett et al., 2022; Kaljee et al., 2018; Makoge et al., 2017; Meiring et al., 2021; Rasheed et al., 2019; Watkins et al.,

2020). Previous researchers also discussed various methods to curb TF spread, such as improving environmental conditions, fixing infrastructure (sanitation, sewage, cleanliness, safe water), provision of better drinking water quality, various medications, updated diagnostic modalities, well-trained doctors, and availability of conjugated vaccines (Fatima et al., 2021; Kaljee et al., 2018).

This research study aimed to gauge women's attitudes and behaviors toward the spread of TF in Gujranwala, Pakistan. There is medication, vaccination, and updated diagnostic tools available in Pakistan. There are, still, some areas in Pakistan where TF is endemic. Audio-recorded interviews of 10 women revealed that participants mostly repeated the same answers, and their knowledge about TF in the area almost resembled each other. Low-educated women were unaware of the definite causative factors for TF spread. These women did not follow many recommendations for prevention and treatment of TF. They did not have any plan to control the spread of TF in their community. They believed in hearsay treatments and management of the disease. They also learnt (from their own experiences) that contaminated water was the main culprit of disease, so they chose filtered water. They noticed drinking filtered water helped them stay free of diseases. They also found that a healthy lifestyle, cleanliness, and hygiene habits were helpful in controlling diseases.

This research study was grounded in the HBM, a theoretical framework which endorsed the trustworthiness of the findings (Glanz et al., 2015). The HBM supported the perspective of social cognition and suggested action and motivation for positive social change in these women's lifestyles (Glanz et al., 2015). Lived experiences revealed the

seriousness of the disease and its spread. Hence all women perceived susceptibility to TF because of their perception (Rosenstock et al., 1998). Initially, women were not serious about TF. However, when every other person was getting sick and started having multiple episodes of TF confirmed by blood testing, they became aware that the disease needed attention. They started to find ways to stop TF spread. Their preventive methods included clean, safe water intake and personal hygiene habits. The participant women found this on their own through lived experiences and by communication with each other.

Previous research studies dealt with TF medication, vaccination, and different diagnostic tools to prevent TF spread. There were studies regarding multiple medications or combining other medicines to combat Typhoid bacteria (*Salmonella typhi*). Previous research studies also recommended different and multiple vaccination strategies (Anwar et al., 2014; Date et al., 2014; Im et al., 2021; Jackson et al., 2015; The Lancet Global Health, 2021; Qadri et al., 2021; Watkins et al., 2020). The previous studies suggested hygiene, sanitation, cleanliness endorsement, vaccination, clean water usage, and the latest or new version of the actual TF diagnostic blood test rather than the old ones to curb TF disease. No previous studies regarding behavior and attitudes of women suffering from TF in low socioeconomic areas were found. One reason could be difficulty in approaching and spending time with this vulnerable population. Thus, participants' answers to this study's research questions fill a gap in the literature regarding firsthand experiences, attitudes, and behaviors of low-income women who suffered from TF disease.

I used the phenomenological approach and conducted ten in-depth telephonic interviews (audio-recorded) of women living in low socioeconomic areas of Gujranwala, Pakistan using a semistructured interview guide. A semistructured interview guide helps researchers achieve rigorous data collection and trustworthiness for their study (Glanz et al., 2015). The phenomenological approach helped me understand lived experiences and focus on women's beliefs, attitudes, and behaviors (Finlay, 2009). The theoretical framework (HBM) helped me understand the participants' actions, reactions, and perceptions in the context of sociological, environmental, and ecological factors responsible for TF spread in the targeted area (Glanz et al., 2015). I explained data collection and data analysis methods in Chapter 4. I shall interpret the findings based on themes and discuss how they relate to the theoretical framework (HBM) in Chapter 5. In this chapter will also cover the limitations, recommendations, implications, and conclusions of the study.

Interpretation of The Findings

The purposeful sampling of this research study comprised of 10 participant women ages between 18 and 45 years (childbearing age) living in a low socioeconomic area of Gujranwala, Pakistan. Participants were married or single and low educated. Only one participant of 18 years was attending high school. Most women stayed home and looked after their families. None of the families earned more than $25,000 per year. There was a steel mill in the area, and most people worked there. In this qualitative study, the research method provided details regarding these women's behaviors, attitudes,

habits, culture, and perceptions towards TF. The findings based on the research questions are as follows:

Research Question 1

What are the attitudes and beliefs regarding typhoid fever (TF) prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?

Ignorance and Mistrust

Nine out of 10 women in this study showed mistrust and no faith in the city government hospital, which was a free-of-cost facility in their area. Twenty percent of the women who went to the government city hospital did not like the behavior of doctors working there, but they said they felt fine after receiving TF treatment. These tertiary care hospitals have the facilities and medication available for screening and treating TF. Mostly women preferred local doctors and low-cost local medical treatments, and 30% believed in religious/spiritual healing. Most women were unaware of the TF disease causative factors and believed stories from local fraudulent medics regarding TF germs. According to Kaljee et al. (2018), household respondents usually narrate stories about their traditional healers for Jhar Phook (healing mantra using sweeping and blowing), taking advice from their local acquaintances or family members, self-medication, and intake of local fever medication (paracetamol) or antibiotics before TF blood culture tests. This kind of behavior is common among people living in low socioeconomic areas who suffer from fever and have no money for healthcare. All these healing tactics waste time, and the disease worsens until these patients reach an appropriate healthcare facility

for TF treatment. There are similarities in decision-making attitudes of low socioeconomic area people in two countries, Nepal and Pakistan, when it comes to seeking outside medical help or hospital care (Kaljee et al., 2018). There are many factors effecting the decision-making process for treatment of diseases: when disease worsens, funds availability, distance, transportation, experience of healthcare provider, trust in physicians, and friendly/familiar and responsible health care facility staff (Kaljee et al., 2018). Pach et al. (2016) also found that healthcare-seeking behavior in Madagascar depends upon the perception of services at the healthcare facility, accessibility, socioeconomic status, and facility utilization for febrile illnesses. The low-income participants in this study reported reluctance, unfounded fears, and mistrust big hospitals, as well as lack of healthcare facilities in their immediate area. These factors played into their decision-making when they sought treatment for TF disease.

Voysey et al. (2020) concluded that many TF cases in Nepal remain undetected because either the tests are expensive, or people of low socioeconomic areas are reluctant to undergo blood testing. Many people do not opt for blood culture tests for TF, although TF is high among children, even if they have a fever, which is how the actual disease is underestimated (Voysey et al., 2020). It is also hard to find accurate data for TF in low socioeconomic areas because many pathogens are causing the disease, and patients do not come to the healthcare facility for treatments or diagnosis (Voysey et al., 2020).

Local Practices

In this study, participants first treatment response was trying home remedies, and then women went to doctors when TF became more severe. After communication, these

women learned to find relief in medication and treatment by authentic doctors in the area. Women tried their best to relieve their fever, vomiting, and diarrhea symptoms of TF with food items (green tea, carrot juice, hot liquids, holy water, holy dates, etc.) or home remedies rather than medication. Thirty percent of the women tried spiritual/religious healers for their fever, but it did not work. Previous research studies also explained that people in different developing countries (Nepal, Bangladesh, India, and different areas of Africa including Blantyre and Malawi) use other low-cost remedies to treat diseases (Garrett et al., 2022; Kaljee et al., 2018; Meiring et al., 2021; Pach et al., 2016). They also go to spiritual/religious/traditional healers to treat fevers and minor ailments (Kaljee et al., 2018; Garrett et al., 2022; Pach et al., 2016). Women in this study showed a similar reliance on home remedies and religious healers to relieve symptoms of TF.

In this research study, 80% of the participant women believed in a clean, sanitized, and healthy environment. A clean and sanitized environment is a must to curb infectious diseases (Rasheed et al., 2019). Approximately 80% of women also wished their local government had taken some steps and showed interest in cleaning up the area and removed all trash, litter, and garbage.

Faith in Biomedicine

When asked about the importance of TF prevention, vaccination, and treatment, most of the women did not know about TF vaccine availability. Sixty percent of the participants wanted to get TF testing and treatment but were unaware about TF vaccine as a prevention. Forty percent of the women knew about the TF vaccine and wanted to vaccinate their children as soon as possible.

Most of the women in this study reported difficulty in obtaining treatment from a government or private hospital. Eighty percent of the participants chose the local dispensary/local doctor for low-cost treatment modalities like oral pills and IV fluids to reduce fever, not to treat the root cause of TF. All of the women in this study had restricted funds and resources for effective TF treatment. Kuijpers et al. (2018) found similar results through their qualitative research study, showing that health-seeking behaviors are mostly economically motivated or controlled.

Research Question 2

What are the perceived sociocultural barriers related to TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?

Obstacles to Treatment and Medical Services

Participants in this study reported that government health care facilities and consultant-level physicians were unapproachable in the local area due to distance. Women were forced to choose local doctors or dispensaries for quick and easy relief from TF disease. Participants often preferred household remedies first and did not visit the hospital as a priority, which is common in other cultures too (Kaljee et al., 2018). There is a dire need to make TF diagnosis and treatment modalities available in high-risk areas (Fatima et al., 2021; Kuijpers et al., 2018). When questions were asked about the TF vaccine, women in this study stated that the vaccine was unavailable in their area because they did not know about it. Some of the women did not talk much about the TF vaccine, which showed their lack of knowledge. Almost every woman went to a local doctor but

did not find relief, conversely women who went to city hospitals for TF treatment felt better. Practically all women suffered numerous episodes of TF disease, which showed that either the medication or treatment method was ineffective against TF. The information derived from these women's interviews indicated that they suffered more TF episodes than they knew. There was also a possibility of multiple drug-resistant TF bacteria in the area, which is common in Pakistan (Butt et al., 2022; Rasheed et al., 2019). The overall control of TF spread in the area seemed very bad.

Environmental Barriers

Almost every woman recognized that an unclean environment and unclean, unsafe water was the prime cause of TF disease spread in their area. They tried keeping clean water buckets in the house and often brought filtered water or used boiled water for drinking purposes. However, based on the widespread reporting of multiple TF episodes, it is apparent that these methods are not working. All women wanted the local government to raise the surrounding sanitation standards. They also wanted the provincial government to take interest and provide filtered water to their houses. Makoge et al. (2017) found similar results in a study about poverty-related diseases in Cameroon. Makoge et al. (2017) reported that poor hygiene conditions were perceived by participants as the most pronounced reason for disease presence, and that some environmental factors, such as poor housing conditions, were out of their control. However, participants, who were college students, also recognized that cleaning up personal surroundings could partially reduce risk for infection (Makoge et al., 2017). The

participants in this study also made efforts to clean their houses and streets outside of their houses.

The lack of a reliable and low-cost transportation system was also a problem in the area. When sick, these women could not travel on their own to visit the city hospital. In addition, they were unable to get filtered water from far away areas. There was no health care facility within walking distance available other than the local dispensary particularly in the research study area. Hence sick women kept visiting the local dispensary for their medication or blood work. These women could not opt for another physician's second opinion when they suffered prolonged sickness.

Life Constraints

Many of the participants' husbands worked as laborers, so they were always short of money. For this reason, women were often neglected when it came to seeking medical help. These laborers had long working hours and usually return home late at night. Most of the participants waited many days with fever to visit the distant, free government city hospital, with their husbands, for TF treatment. Kuijpers et al. (2018) also found that economic-driven health-seeking behavior propels people to opt for cost-effective disease treatments. Sometimes it took them weeks and months act on the best option.

Participants in this study complained that the government lacked interest in their area, and they found garbage, trash, and open filthy drains in the targeted area. Several women said that government must take an interest in the targeted area if they want to control TF disease spread. Stakeholders living in the society must also help clean the place. They should have introduced the TF vaccine, improved sanitation standards, and

supplied clean, safe drinking water to their homes. Women participants were looking for help from manpower as women could not clean the huge area themselves.

Research Question 3

What factors impact the decision-making process related to TF prevention and treatment among women of childbearing age living in low socioeconomic areas of Gujranwala, Pakistan?

Perception of Risk

When asked about TF spread, almost every woman recognized that many people were suffering from TF in the community. Women told stories about their neighbors, close friends, family, and extended family members who suffered TF. Women also talked about TF spread in the community and stated that it was rising daily. According to Kuijpers et al. (2018) high-risk areas like Cambodia or low socioeconomic areas need improved modalities for prevention and treatment of TF, plus there is a need for literacy and education among people regarding the transmission of the disease and how to manage or treat TF. The tests on urine and blood could also reveal TF metabolite and detect the disease in an individual (Näsström et al., 2017). The government must introduce low-cost TF diagnostic tools in high-risk areas to curb disease spread.

Women living in the low socioeconomic area of Gujranwala, Pakistan suffered multiple episodes of TF. Half reported suffering TF many times and complained about prolonged sickness and treatment. These women all knew they were at high risk for TF infection because of their living conditions. Most of the women in this study tried to self-medicate by taking fever medication or religious/spiritual therapies. Their husband or a

family member was also involved in the initial self-medication process. Five of ten women were reluctant to disclose at home that they were suffering from fever until the condition worsened. These women, due to low education, did not ask their treating physicians about medication, the factors responsible for the disease, or any preventive methods. City hospital physicians told only two women to raise hygiene and cleanliness standards. There was a lack of open communication between doctors and their patients. No recent studies have reported these kinds of findings about perceptions of TF risk; therefore, these details are a unique contribution of this study to the literature on TF in developing countries.

Gender Issues

Forty percent of the participants took care of their children at home, and the rest stayed home for house chores and the family. After speaking to them, it seemed they lacked confidence when making decisions about their health, diseases, or even stepping out of the house. None of the women went alone anywhere out of the house, even to the local dispensary. This lack of confidence to leave the house alone could be due to an unsafe environment, or the cultural setting in Gujranwala, Pakistan. Participants consulted and prioritized other family members' decisions regarding medication and health issues. In a study on gender norms in Pakistan, Rizvi et al. (2014) found that decisions trickle down from elders to household men and younger women. Kuijpers et al. (2018) also concluded that older people think primitive health care practices are safe and endorse them as home remedies. That might explain some of the treatment-seeking behavior of women in this study.

Women of the targeted area believed in the local doctor's information about TF. These women did not confirm it from other healthcare personnel and had limited knowledge of TF. This resulted in prolonged sickness and health complications. In the study by Rizvi et al. (2014), women faced more neglect and suffered complications of TF than men. Jena et al. (2017) reported that other than sickness, women can face miscarriage, fetal demise, lethargy, untreated diarrhea, loss of appetite, anemia, and poor health can lead to carriers of TF or tuberculosis. Women need education and support to make timely health decisions. Pakistan, like other developing countries, is one of the gender-suppressed societies (Rizvi et al., 2014), and women need help in this area of Gujranwala. There is a higher rate of childbirth in Pakistan; hence childbearing-age women need attention (Jabeen et al., 2020). This research study will help raise awareness for the women living in low socioeconomic areas of Pakistan, which is a contribution to positive social change.

Health Belief Model

The HBM was used as a framework to understand and interpret participants' decision-making process and behaviors in the context of sociocultural and environmental barriers related to TF. The following constructs of the HBM shed light on the themes identified in this study. The construct of a perceived threat of disease is characterized by a perceived vulnerability and a perceived severity (Glanz et al., 2015). Most women in this study recognized that they were highly vulnerable to TF, as evidenced by the number of times they were sick themselves and the high rates of infection they observed in the

community. However, a lack of knowledge about symptoms and treatment hindered TF's perceived severity.

Perceived benefits refer to perceptions of the effectiveness of taking certain actions to reduce threat of a disease (Glanz et al., 2015). Most of the participants went to the local dispensary or local doctor and received oral and IV medication. Women who did not find relief went to the city hospital or chose local doctors for IV medicines until symptoms subsided. Due to lack of knowledge, two participants kept switching between religious healers and doctor treatments. Many women realized that using filtered water, adopting hygiene habits, and keeping a clean environment helped prevent the disease. Women also wanted TF vaccination and felt the need for vaccine availability in their area.

Perceived barriers refer to feelings about the obstacles related to performing recommended health actions (Glanz et al., 2015). In this study, participants mentioned many barriers. These women of childbearing were dependent on their husbands and elders for the final decision of treatment and visiting the hospital. Also, they mentioned lack of monetary funds and reliable transportation. A cue to action refers to the stimulus that triggers the decision-making process to respond to diseases (Glanz et al., 2015). This study's predominant cue to action was prolonged sickness and severe disease symptoms. The signs and symptoms of TF persisted for a long time, and they participants did not feel well for days and weeks. Some of the women had suffered more than one episode of TF. Initial treatment from religious/spiritual doctors and home remedies prolonged their sickness. Some women were misguided about the disease by local doctors, quacks, and

spiritual/religious doctors. These participants were unable to do house chores due to fever, weakness, and muscle aches. The constant feeling of illness persuaded their family members to seek relief from health care facilities.

Self-efficacy refers to the level of one's confidence in her ability to successfully perform a behavior (Glanz et al., 2015). Perceived barriers and lack of self-efficacy dominate decision-making regarding TF prevention and treatment among women of childbearing age in Gujranwala, Pakistan. These women lacked the confidence to inquire about TF causative factors and preventive strategies from healthcare workers or doctors. Household elders and men made most of these women's health-seeking decisions and accompany them outside their homes. The participants first tried home remedies and religious healers. When they did not get well, they went to local pharmacies and doctors for medicinal treatment. Lack of funds, education, awareness, and confidence deprived these women of making any self-improvement decisions. Nonetheless, participants in this study learned some preventive modalities from their own disease suffering experiences, and from their discussions with acquaintances. These results show that with a little bit of education and awareness, women in low socioeconomic areas of developing countries can make changes to individual level prevention methods such as hand washing and maintaining a clean house.

Limitations of the Study

I had some limitations due to the COVID-19 pandemic, and I could only interview participants through the phone. I might have missed some women who stayed home all the time and did not communicate with others or neighbors. There is a

possibility that I had missed some information, and for that, I had to recruit more women for telephonic interviews. In this qualitative study, most women gave interviews in their local language, Urdu. It made them comfortable to express their stories, but the downside was that I could have misinterpreted some of the meanings of the words while translating.

Social media advertisement worked well for this study, but it may have introduced selection bias because not all women in low socioeconomic areas have access to internet. Out of eleven participants, one interview session was disregarded because it was incomplete, and the woman left during the session; hence, ten complete audio-recorded interviews were included in data analysis. Due to a bad device or defective internet connection, there was one woman I had to repeat and explain the questions many times. It was time-consuming and challenging, especially when the internet connection and cell phone connection was not good. I did not do FaceTime or video call interviews of any kind as participants were not comfortable with it. Hence, accurate facial expression recording was impossible. Also, I ensured women were in a separate room alone, so there was minimum interference in their privacy, and only their actual views were audio-recorded in Urdu. I took everything objectively to avoid bias and translated all interviews into English. I also asked the participants if they would like to review their transcribed and translated interviews, but they all declined. To avoid introducing researcher bias during coding and data analysis, my dissertation chair reviewed all transcripts, codes, and themes to ensure reliability.

Recommendations

This qualitative study examined the actual lived experiences of women, and I would recommend future face-to-face interviews in the local language to extract more information from these women. Also, living in the area would give a researcher first-hand knowledge of a woman's life. A research study regarding the availability of quality TF medication and TF vaccines in the area could help people of low socioeconomic regions because they were sick longer than usual. If researchers could live in the area, they could have observed the details of treatment modalities and approachable healthcare facilities. These researchers would also pinpoint if there were any new introduced low-cost TF management interventions in the area. Future studies must include these steps and take a closer look into other factors responsible for spreading TF in the area, including personal hygiene, faith in medical treatments, cost of treatment and prevention, environmental conditions, and clean water supply.

Also, one could further understand how women living in low socioeconomic areas survive and make their disease treatment decisions. It was essential to understand attitudes towards the disease and how they impact the spread of TF. When doing future research studies, one must consider that these people have different sociocultural circumstances. Societal issues and life constraints for women of childbearing age in Gujranwala, Pakistan are diverse and challenging. These women have been living with low funds, as well as fewer facilities and resources in the area. They often face neglect, so only open-ended questions work best while interviewing them as participants. I wanted to spend more time in the area to observe and get answers to questions by

observation instead of asking these women more direct questions (e.g., What is your behavior when you go to religious doctors or quacks? How do you manage disease on a low income? What kind of medication or treatment did you use first for fever? Can you show me the medicine? Why did you take medicine from a local dispensary/doctor first if you can go to big city hospitals?). Future studies could include ethnographic methods such as living in an affected area and getting to know the people and their behavior more closely.

A researcher can also conduct in-depth interviews with local quacks and religious healers to understand their way of treatment, because these alternative healers do not know anything about TF bacteria and its disease treatment. I did not ask direct questions and preferred listening to the stories of the participants because there could be a possibility that these women felt interference in their personal life. The women of this research study narrated their stories, and I audio-recorded them patiently. Most of the time, they described the societal problems they face while living in that region of Gujranwala, Pakistan.

Researchers can use quantitative research methodology to study TF incidence and spread. Näsström et al. (2017) did qualitative and quantitative (on blood and urine samples) research on the people of Bangladesh and Africa and found TF incidence, mortality, and morbidity to confirm the burden of TF disease in the area. Fatima et al. (2021) also did a retrospective study to prove the burden of TF disease and its associated morbidity and mortality issues. There were studies on vaccination in bigger cities like

Karachi, Pakistan (Khan et al., 2015), and these should also be conducted in low socioeconomic areas like Gujranwala, Pakistan.

Another recommendation is to do research on different treatment options available in the area. Stoesser (2013) researched how different medications can treat TF effectively. More research studies could include other combinations of medication to combat drug-resistant TF bacteria lurking in these areas (Saleem & Hassali, 2019). Another interesting future qualitative research study could be done involving the city hospital doctors and healthcare workers with a face-to-face interview regarding doctor-patient communication and trust issues.

Implications

The research findings may give a wake-up call to the local government to install a filtered water system for people living in the low socioeconomic region in Gujranwala, Pakistan. These low-socioeconomic areas had many problems, including the unavailability of a clean, safe water supply. This research study may help policymakers, government officials, and healthcare officials to make decisions that keeps in mind the women who live in difficult circumstances. They should consider providing more compassionate health care workers and trained doctors and making TF vaccines available for the health facilities focused on controlling TF in the area. The study findings could help community workers, government officials, and healthcare workers to find ways to prevent TF in the region. They can educate people by giving lectures or holding conferences or classes on TF control methods in the Gujranwala areas. By finding out more about local women's problems, they can educate women regarding their ineffective

behaviors to help manage or control TF spread in the area. Women in low socioeconomic areas of Pakistan should be reminded to opt for the TF vaccine and treatment, follow hygiene habits, maintain cleanliness around the house, and start giving importance to sanitation. Women's health plays a vital role in the family, and they can make independent and right decisions if educated enough and made aware of the disease and its control (Rizvi et al., 2014).

The introduction of TF vaccination programs and effective medicinal treatment in the area can also decrease the spread of TF in the region. Community health workers who are females can also go door to door in the targeted areas and educate women while offering TF vaccination. It is the same as midwives who go door to door and help women with their pregnancy problems. Midwives advise pregnant women to take vitamins, including important ones like folic acid, iron, and vitamin D and announce the tetanus vaccine at the appropriate time. Another intervention could be making the TF vaccine accessible to the area in the local dispensary. A responsible pharmacist or doctor can help TF patients by giving them TF disease education and awareness by answering individual questions or delivering lectures twice a week. Moreover, public health professionals can distribute colorful pamphlets with pictures about the TF disease and its prevention in the area.

Conclusion

TF is still a significant worldwide public health problem despite advancements in technology and medical science (Ashurst et al., 2021; Im et al., 2021; Im et al., 2022; Kaljee et al., 2018; Meiring et al., 2021; Voysey et al., 2020). All previous research

studies discuss the rising threat of typhoid incidence, multiple drug-resistant typhoid bacteria, treatment, medication, diagnostic tools, hygiene, improved sanitation, clean, safe water usage, updated sewage system, and conjugate vaccination (Butt et al., 2022; Garrett et al., 2022; Kaljee et al., 2018). Previous research studies also explain that living in sanitized areas and usage of clean water, and hygiene habits reduce TF spread. Im et al. (2022) assessed in their research study that living in the area with modest improvement in house-hold water, sanitation, and hygiene (WASH) reduces TF by 48% and TF vaccine reduces TF by 55% in endemic areas. This research study explained the attitudes and behaviors of people in a low socioeconomic area of Gujranwala, Pakistan as well as details about their experiences with TF and how they manage the disease. This research study used open-ended questions in the local language (Urdu) and audio-recorded interviews captured the lived experiences of women related to TF spread in the area. The results of this qualitative study showed that women of childbearing age in Gujranwala had multiple and extensive problems and experiences regarding TF illness. Findings also indicated that these women faced many problems, including mistrust, environmental barriers, life constraints, perception of risk, gender issues, and low funds, that limited their ability to prevent and manage TF. Easily accessible interventions and prevention programs are essential to control TF disease spread.

Positive Social Change

This study can propel local stakeholders to endorse strict, improved programs, laws, and rules including surveillance regarding environmental cleanliness, sanitation, and hygiene. Future education and awareness campaigns can make women aware of

prevention methods for TF, availability of the TF vaccine, and effective TF treatments. This research study can help the local government to address the environmental conditions, provide clean, safe drinking water, and improve sanitation in the community. The government may bring change in future health policies and make systematic changes needed to reduce barriers to healthcare facilities for people from low socioeconomic areas. This study demonstrates that a multifaceted approach can impact positive social change and combat TF spread among women of childbearing age living in low-socioeconomic regions of Gujranwala, Pakistan. TF is a controllable and preventable disease. It requires behavior change, attitude modification, lifestyle shifts according to disease severity, awareness of the disease, and extra attention from residents and local stakeholders. Additionally, findings from this study make the barriers to TF prevention and control clearer and the provisional and Federal Governments can work jointly (as they do in big cities) to curb TF disease spread in the area.

This study focused on women and their problems. Women also need more education, awareness, and confidence to impact positive social change. This study provided a means for women to raise their voice about a persistent and pervasive health problem in their community. It is time for the government officials and people of Pakistan to understand and acknowledge the presence of young women and give importance to their health.

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Appendix A: Screening Questions

The following questions were used to recruit eligible participants for the study.

1. What is your sex? (Continue if female)
2. What is your age? (Continue if 18-45yrs)
3. Do you currently live in Gujranwala, Pakistan? (Continue if yes)
4. Have you experienced typhoid fever while living in Gujranwala? (Continue if yes and enroll in the study if the participant agrees).

Interview Questions

The following interview questions were used for the research study.

Demographic Questions:

1. How would you like me to address and introduce you?
2. How long have you lived in the Gujranwala, Pakistan, area?
3. What is your marital status?
4. Do you have children? If yes, how many?
5. What is your religion?

Interview Questions:

6. What do you know about different kinds of fever?
7. How do you think typhoid fever spreads?
8. What measures can you take at home to prevent the spread of typhoid fever?
9. Tell me about your experience of contracting typhoid fever.
10. Have you ever been tested for typhoid fever? If yes, how, and where? If not, why not?

11. Where do you think typhoid fever comes from? How do you get the disease?
12. What is your attitude towards typhoid fever and its complications? Do you think it is a life-threatening disease?
13. What do you know about the importance of sanitation? What do you do to maintain hygiene habits or hand washing? How do these habits affect disease prevention? How many family members understand this?
14. How do you think you could overcome the barriers to changing your behavior toward typhoid fever disease?
15. What stands between you and a change in lifestyle or behavior?
16. What is your motivational support to give the final push to change your lifestyle or behavior?
17. In your culture, how is typhoid fever disease treated?
18. What are your thoughts and beliefs about typhoid fever medications and vaccination?
19. Where do you stand when it comes to decision-making in your home, even if it is to take some medication for fever?
20. How do you think women can make some decisions or provide some ideas about health-seeking behaviors in your home? How can you change your family members to make positive changes in health behaviors around the house? If not, then what are the consequences?
21. Is there anything you would like to add to the discussion?

……

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اسکریبنر سوالات

-(اگر عورت ھے تو جاری رھیں)آپکی جنس کیا ہے؟ -۱

۰(اگر ۱۸ سے۴۵ سال کے درمیان ہے تو جاری رہیں)آپکی عمر کیا ہے؟ -۲

۰(اگر ہاں تو جاری رھیں)کیا آپ گوجرانوالہ کی مکین ھیں؟ -۳

اگر ہاں اور خاتون راضی)کیا آپکو ٹائیفائیڈ بخار کا گوجرانوالہ رہائش کے دوران تجربہ ہے؟ -۴

۰(ہیں تو ریسرچ میں شامل کر لیں

انٹرویو کے سوالات

آپ کو کیسے مخاطب کیا جائے؟-۱

آپ کتنے عرصہ سے گوجرانوالہ مکین ہیں ؟-۲

کیا آپ شادی شدہ ہیں؟ -۳

کیا آپکے پاس بچے ھیں؟ اگر ہاں تو کتنے ہیں؟ -۴

آپکا مزہب کیا ھے؟ -۵

آپ کتنے قسم کے بخار سے واقف ہیں؟ -۶

ٹائیفائیڈ بخاریا متعدی بخار پھیلنے کی وجوہات کے بارے میں آپ کیا جانتی ہیں؟ -۷

متعدی بخار سے پرہیز کیسے کیا جا سکتا ہے؟ -۸

آپ کو ٹائیفائیڈ بخار یا متعدی بخار کبھی ھوا ؟اگر ھوا تو کیسا تجربہ لگا؟ -۹

کبھی متعدی بخار کا ٹیسٹ کروایا ؟کہاں، کیسے اور کب؟اگر نھیں تو کیوں نھیں؟ -۱۰

کیا آپ جانتی ھیں کہ متعدی بخار کیسے اور کیوں ھوتا ھے؟ -۱۱

اس بیماری کی پیچیدگیوں کے بارے میں آپ کا متعدی بخار کے متعلق کیا تجربہ ھے اور آپ کا -۱۲

کیا خیال ھے؟ کیا یہ ایک مہلک بیماری ھے؟

آپکی فیملی آپ کا صفائ کے بارے میں کیا رائے ھے؟ ھاتھ دھونے سے کیا فرق پڑتا ھے؟ -۱۳

صحت اور صفائ کے متعلق کتنا جانتے ھیں؟

آپ کا کیا خیال ھے کہ آپ اپنا رویہ متعدی بخار اور اسکی روک تھام کی طرف بہتر کر سکتے -۱۴

طریقے ھیں؟ کیا اپ موجودہ رکاوٹتوں کو دور کر سکتی ھیں جو اپ کو ٹائیفائیڈ بخار کو بہتر

سےھینڈل کرنے میں مدد دے-

۱۵- کیا چیز آ پ کے بہتر رویے اور متعدی بخار کی تیزی سے بڑھتی ہوئی شرح فیصد کو کم کرنے

کے درمیان حائل ھے؟

۱۶- وہ کیا محرکات ھیں جو آپ کی زندگی میں مثبت تبدیلی کے لیے مدد گار ھوں گے؟

۱۷- آپکی ثقافت ٹائیفائیڈ بخار یا میادی بخار کا کیسے علاج کر تی ھے؟

۱۷- آپکا متعدی بخار کی دوائی، علاج اور حفاظتی ٹیکوں کے متعلق کیا رائے ھے؟

۱۹- آپکی رائے کونسے نمبر پہ آتی ھے جب علاج کی ضرورت پیش آتی ھے؟ اگرچہ صرف بخار کی دوائی کی ھی ضرورت کیں نہ ھو؟

۲۰- ایک عورت کی صحت کے متہلق رائے یا کوئی فیصلہ گھر میں کیا اہمیت رکھتی ھے؟ اپنے گھر والوں کو کیسے صحت اور صفائی کے مثبت طریقے اپنانے میں راضی کر سکتی ھیں؟ اگر وہ نہ مانیں تو اسکے اثرات کیا ھوں گے ؟

۲۱- آپکے اور کوئی خیالات یا رائے جو آپ ھمیں دینا چاہئیں؟

Appendix B: Flyer (English Version)

Wanted: Gujranwala resident women aged 18-45 years and have experienced typhoid fever while living in Gujranwala.

You were asked to complete a telephonic interview lasting 30-60 minutes. All information provided will remain confidential. For your participation, you will receive $20.00 compensation.

This study is being conducted by Tehmina Khan, a graduate student in Public Health at Walden University.

If you are interested in participating in this study, please call or send message to 03215358783 or 03060452514.

Flyer (local language)

مطلوبہ افراد: ۱۸سال اور ۴۵ سال کے درمیان عمر کی خواتین جن کی سکونت کجرانوالا کی ہو
ٹائیفائیڈ بخار یا متعدی بخار کا تجربہ ہو اور انکو.

ان خواتین سے ۳۰-ان خواتین سے ۳۰ منٹ کا ٹیلیفون انٹرویو درکار ہے۔ ۶۰. ساری معلومات رازداری میں رہے گی. اس
سکہ راجالوقت کے حساب سے ملیں گے انٹرویو کے اویس آپکو ۲۰ ڈالر.

یہ ریسرچ ڈاکٹر تہمینہ کے زیرے نگرانی ھو گی .جو وال ڈن یونیورسٹی کی پبلک ہیلتھ کی
گریجوءیٹ طالبہ ہیں.

اگر اپ اس ریسرچ میں حصہ لینا چاہتے ہیں تو برائے مہربانی اس نمبر پر رابطہ
03060452514 / 03215358783.کریں