2023-09-19

Doctoral Dissertation of
St. Luke's International University
Graduate School (2023)

Development and Feasibility Evaluation of the Program to Fostering "Goal-Driven Actor" for Health Workforce Involved in Primary Health Care in the Republic of Kiribati

キリバス共和国のプライマリーヘルスケアに携わる医療従事者を対象とした「目標達成のための行動力向上プログラム」の開発と実行可能性の評価

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Contents

CHAPTER I：INTRODUCTION

Background 1

Transition of challenges related to global health 1

UHC and People-Centered Care (PCC) 2

UHC and Primary Health Care 2

WHO WPRO's vision for addressing global health-related challenges 3

Geographical, demographical, and healthcare situations of the Republic of Kiribati 5

Aim 6

Goals 6

Significance and the novelty of the research 7

CHAPTER II: LITERATURE REVIEW

Trends in quality management and problem-solving in the healthcare sector 8

Educational intervention study for healthcare workers 9

Current situations of nursing education in Kiribati 9

Current research on health issues in Kiribati 10

CHAPTER III: PRELIMINARY STUDY

People-Centered Care: Concept Analysis 13

Relationship between Preliminary Study and Main Doctoral Study 13

Introduction 13

Purpose 13

Method 14

Data collection 14

Data Analytics 15

Results 15

Discussion 19

Conclusion 21

Implications for the main Doctoral Study 22

CHAPTER IV: METHOD

Positioning of this research in the project 36

Research design 36

Phase 1: Inductive qualitative descriptive study 42

- Purpose of this phase 42
- Phase 1 research design 42
- Target population 42
- Facilities and recruitment methods 43
- Research procedures 43
- Analysis method 44
- Ethical considerations 44

Phase 2: E-learning content development 46

- Using e-learning in this study 46
- Aim of the e-learning program 46

E-learning program construction 46
Procedure for developing the e-learning content 47
Building an e-learning system 47
Expenses 48
Phase 3: Conducting and evaluating the e-learning program 48
Phase 3 research design 48
Setting and participants 48
Facilities and recruitment methods 49
Research procedures 49
Phase 4: Evaluation of the Kaiketsu project, including online workshop implementation and evaluation 50
Phase 4 research design 50
Setting and participants 50
Content of the workshop 50
Outcome measures 52
Statistical analysis 54
Ensuring the validity of the qualitative analysis 54
Ethical considerations. 54

CHAPTER V: RESULTS

Overview of health and medical services in Kiribati (see Appendix 14) 57
Phase 1: Inductive qualitative descriptive study 60
Results 60
Conclusion 61

Phase 2: Development of e-learning content 61

Phase 3: Conducting and evaluating the e-learning program Results 63

Results 63

Clinical outcomes 64

Phase 4: Evaluation of the Kaiketsu project, including online workshop implementation and evaluation 65

Results 65

Clinical outcomes 80

Implementation outcomes 85

CHAPTER VI: DISCUSSION

Summary of findings 90

Clinical outcomes 91

Implementation outcomes 94

Agreement and disagreement with other studies 97

Implications for nursing practice 97

Limitations and future studies 98

CHAPTER VII: CONCLUSION 114

CHAPTER I： INTRODUCTION

Background

Transition of challenges related to global health

The world is in a constant and rapid state of transition. While, through economic development and improved public health, the eight Millennium Development Goals (MDGs) that were set to be achieved by 2015 have been realized, new and unmet challenges have been identified (World Health Organization; WHO, 2015). One of these challenges is that while rapid development creates new opportunities for some people, it tends to result in the exclusion of others. This is because development fosters health and gender inequalities, poverty, and disadvantages, all of which contribute to poor health. To address this problem, the United Nations' Sustainable Development Goals (SDGs) for 2030, which consist of 17 goals and 169 targets, pledge to "leave no one behind" (United Nations, 2015). Health improvement is one of the 17 goals under "Goal 3: Ensure healthy lives and promote well-being for all at all ages" with 13 targets. Along with measures to reduce maternal, neonatal, and infant mortality, control infectious and non-communicable diseases (NCDs; lifestyle-related diseases), drug and alcohol abuse, and road traffic accidents, and promote mental health, family planning, and reproductive health, it also highlights protection from financial risk for all, access to quality basic health services, and access to safe, effective, and quality health care. It also includes achieving universal health coverage (UHC), which includes access to safe, effective, quality, and affordable essential medicines and vaccines for all, and addressing environmental pollution.

UHC means that all individuals and communities receive the health services they need without suffering financial hardship (WHO, 2021). Achieving UHC is a top priority for

the global health community and is essential for achieving various health sector goals.

UHC and People-Centered Care (PCC)

The WHO has developed a policy framework for people-centered care (PCC), stating that reformation toward people-centered health service delivery is essential to achieve UHC (WHO, 2007). This framework shows that for health care to be truly universal, relevant, and responsive to a changing world, it needs to be transformed into a health system designed for and with people. Reforming people-centered health service delivery is essential for achieving UHC. A strategy that will guide the organization's work over the next five years (2019-2023) is highlighted in WHO's 13th General Programme of Work (WHO, 2018). PCC has broader implications than patient-centered care, which focuses on the individual seeking care, as it also focuses on the health of people in the community and the important role of people in shaping health policy and services (WHO, 2010). PCC was defined as "a partnership between community members and healthcare providers to improve the health problems of individuals or the community and an initiative whereby those who receive care play a central role" by the PCC Practice Development Research Department, St. Luke's International University (Takahashi et al., 2018).

UHC and Primary Health Care

Given the importance of strengthening primary health care to achieve UHC, the Astana Declaration, which pledges to ensure a strong primary healthcare system, was adopted at the 2018 International Conference on Primary Health Care. Sixty percent of the world's health workforce are nurses (WHO, 2020) and many nursing professionals

support primary health care, which is the closest to people's lives. A report by the UK's All-Party Parliamentary Group on Global Health (2016) concluded that empowering the nursing profession contributes directly to the three development goals of the SDGs. Specifically, these are (1) Goal 3: Ensure healthy lives and promote well-being for all at all ages; (2) Goal 5: Achieve gender equality and empower all women and girls; and (3) Goal 8: Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all. Empowering the health workforce, especially nurses, and improving their ability to take action toward achieving these goals will help solve health issues. Furthermore, such empowerment may contribute to improvements in the healthcare system and social structure in the future.

WHO WPRO's vision for addressing global health-related challenges

In addition to the Astana Declaration, a vision for addressing global health-related challenges was endorsed at the 70th session of the WHO Regional Committee for the Western Pacific in October 2019. The WHO WPRO announced four thematic priorities and seven operational shifts (described below) for WHO activities in the Western Pacific region over the next five years, which were geared towards jointly addressing current and future health challenges (WHO, 2020).

Four Thematic Priorities

1. Health security, including antimicrobial resistance
2. NCDs and aging
3. Climate change, environment, and health
4. Reaching the unreached – people and communities still afflicted by infectious disease and high rates of maternal and infant mortality

Seven Operational Shifts

1. Finding new approaches to meet future challenges (innovation)
2. Working backwards from the longer-term goal (back casting)
3. Taking a systems approach, with universal health coverage as the foundation
4. Building solutions from the ground up (grounds up)
5. Driving and measuring country impact
6. Promoting health, beyond the health sector
7. Strategic communications

To achieve the SDGs, particularly in the low- and middle-income countries of the Western Pacific region, WHO WPRO and St. Luke's International University have planned a project to develop an educational program that aims to empower the primary health care frontline workforce and improve their ability to take action to achieve their goals. The project, named Kaiketsu project, will start in the Republic of Kiribati (Kiribati) on a trial basis, which the WHO WPRO selected as the project pilot country. Kiribati was selected because it has a high affinity for incorporating new solutions as its health sector is a national-level priority and because there is a higher need for online learning among healthcare workers working in remote island health centers due to there being many islands and lack of transportation.

In this doctoral dissertation, which forms part of the Fostering "Goal-Driven Actor" project, I will describe the development and feasibility evaluation of an e-learning course and related content that will be needed to implement the project’s program and help healthcare workers acquire the basic knowledge needed to achieve healthcare goals. To emphasize the goal-oriented approach in this program, the term "Kaiketsu"

will be employed, which is synonymous with problem-solving.

Geographical, demographical, and healthcare situations of the Republic of Kiribati

Kiribati is an island nation located in the Pacific Ocean formed by 33 unique islands, of which 20 are inhabited. It has an area of about 810 square kilometers, a population of 120,000 whose official languages are Kiribati and English, and a lower-middle-income economy (World Bank, 2020). Kiribati has a hot and humid climate, with very little variation in maximum and minimum temperatures throughout the year. The top causes of death in the entire population are ischemic heart disease, stroke, and diabetes, all of which have increased in the last decade (VOS et al., 2020). Kiribati's achievement of the SDGs has not been comprehensively assessed because many of the necessary data are not yet available. However, Goal 3, "Health and well-being for all," is listed as a major challenge, with only moderate improvement observed (Sachs et al., 2021). However, regarding key health indicators, the country has a life expectancy at birth of 59.4 years, a maternal mortality rate of 92 per 100,000 live births, a neonatal mortality rate of 22 per 1,000 live births, and an under-five mortality rate of 51 per 1,000 live births, all of which are worse than the global and Western Pacific averages. In addition, the UHC service coverage index (coverage of essential health services) is 41, with 2.0 doctors and 38.3 nurses and midwives per 10,000 people, indicating that healthcare resources are scarce (WHO, 2021).

Kiribati has 75 health clinics and 30 health centers providing primary care. The health clinics are staffed by community nurses and nurse aides (WHO, 2017). Nurse aides do not dispense medicines; rather, they are trained to recognize the danger signs of illness.

Health centers provide primary health care as well as curative and preventive services and they are staffed by medical assistants (registered nurses who have undertaken additional training). These nurses are the key health personnel of each island. The country has three referral hospitals operated by doctors, nurses, and allied health staff. These hospitals receive referrals from health centers. There is also a central hospital located in the capital that receives referrals from these hospitals and health centers. The referral hospitals and central referral hospitals are used for secondary care. Occasionally, patients may be taken to Fiji for emergency evacuation by plane. Specialized secondary or tertiary care cases are referred overseas (Pacific Open Learning Health Net, 2021). Fundamental health services are delivered free of charge through a network of these health facilities.

Aim

This study aimed to develop and assess the feasibility of the Kaiketsu program, which is designed for the primary health care workforce.

Goals

The goals of this study are as follows.

1. To identify the challenges and needs of primary healthcare workers in Kiribati.
2. To determine culturally appropriate and needs-based content for the Kaiketsu program to suit the primary healthcare workforce in Kiribati.
3. To create e-learning-based learning content to help acquire the basic knowledge for Kaiketsu program.
4. To evaluate the feasibility of the created e-learning-based learning content in Kiribati.

5. To adapt the Kaiketsu program for the health workforce involved in primary health care in Kiribati.
6. To conduct a program evaluation of the Kaiketsu program for the health workforce involved in primary health care in Kiribati.

Significance and the novelty of the research

The implementation of an educational program that aims to improve the Kaiketsu project's success among primary healthcare workers in Kiribati is expected to empower such workers, especially nurses, and improve their ability to achieve goals and solve health problems. Furthermore, in the future, it may contribute to healthcare safety, healthcare quality improvement, and healthcare system and social structure enhancements.

The novelty of this study is that the project will be developed and adapted for primary healthcare workers in low- and middle-income countries in the Western Pacific region, based on successful practices in Japan. Particularly unique is that the program incorporates quality management practices that have primarily been developed in the manufacturing sector for patient safety. The method is characterized by the fact that not only the organization's leaders but also all staff members understand how to solve problems and practice it under the responsibility of each person in their respective positions. It is a feature that differentiates it from existing leadership programs. In addition, the concept of People-centered Care is replaced by the concept of "customer first" in quality management as a foundation concept, aiming to create a program that is more relatable to healthcare workforces involved in primary healthcare.

CHAPTER II: LITERATURE REVIEW

Trends in quality management and problem-solving in the healthcare sector

Quality management originated from the U.S. manufacturing industry. In the 1950s, Japan's executives had the opportunity to learn management from American instructors invited by the GHQ. W. E. Deming's teachings, which were centered on statistical quality control, quickly spread throughout the country, producing many high-quality Japanese products (Furuya, 2013). In the 1980s, Japanese quality control culture and techniques were used to improve healthcare quality in the United States. Later, as part of the promotion of medical safety in the Japanese medical community, quality management and safety management cultures and techniques were incorporated into Japanese healthcare by reimporting U.S. approaches (Uehara, 2004). Quality management approaches are widely used in Japan's international cooperation (Ishijima et al., 2019; Hasegawa and Karandagoda, 2013; Hasegawa, 2006). Regardless of the context of international cooperation, it has also been incorporated into healthcare quality management as a "Kaizen" method (Barraza & Davila, 2020).

Many activities (QC circle activities or activities by another name) have been reported in Europe, consisting of small groups of 6–12 helathcare professionals who meet regularly to reflect on and improve standard practice (Rohrbasser et al., 2018). However, most of these were aimed at general practitioners (GPs) (Grol et al., 1994; Newton, 1992; Watkins et al., 2004; Verstappen et al., 2004), and only a limited number were aimed at nurses. In community health nursing, a participatory group problem-solving approach consisting of a 6-hour workshop and six months of practicing QC meetings was adopted. With approximately 250 supervisors and staff nurses in a public health nursing department in Oklahoma helping to prepare nurses to use the QC

process, as well as to prepare and implement the QC program, resulted in effective problem solving, improved quality of care and documentation, increased efficiency in service delivery, and increased employee motivation (Schmele et al., 1991). An RCT of primary care physicians in the Netherlands showed that unnecessary testing was reduced and cost savings were achieved by attending a small-group quality improvement sessions (Verstappen et al., 2004).

Educational intervention study for healthcare workers

Patient-centered health care (or, more broadly, people-centered health care) has attracted increasing attention from healthcare organizations, providers, and consumers since the 1990s (WHO, 2007). Although the concept of patient-centered care is limited to patients (involvement of family and friends) than people-centered care, it emphasizes the partnership between patients and healthcare professionals. It emphasizes partnership in health, acknowledges patients' preferences and values, promotes flexibility in healthcare delivery, and seeks to move beyond the traditional paternalistic approach to health care (WHO, 2007). To improve the quality of healthcare services, a patient-centered approach to care delivery has been increasingly advocated and reportedly being incorporated in the training of healthcare professionals (Dwamena et al., 2012). A multicenter controlled pre- and post-test design study with randomized cohort assignment was conducted to evaluate the effectiveness of a dementia communication support training program for community-based care staff for the elderly found significant effects on care staff knowledge and confidence in providing care to people with dementia (Conway, 2016).

Current situations of nursing education in Kiribati

Nurse education in Kiribati is provided by the School of Nursing and Health (SONH) at

the Kiribati Institute of Technology (KIT), mainly under its core Kiribati Diploma of Nursing program (Birks et al., 2017). The central objective is to produce generalist nurses with a broad range of practical skills. The Diploma of Nursing program is delivered over six semesters, three years. This course is delivered by KIT, taught to Australian standards, and is subject to ongoing quality assurance checks (SONH, 2017). The curriculum covers the field of nursing. Concretely, it includes Introduction to Nursing, Human Bioscience, Nursing Theory and Practice, Medical and Surgical Nursing, Normal Obstetric Nursing, Abnormal Obstetric Nursing, Pediatric Nursing, as well as Primary Health Care/Health Promotion and Nursing in Remote Areas (SONH, 2017). Midwifery education is also provided by SONH and undertaken by Registered Nurses as an 18-month postgraduate qualification (Birks et al., 2017).

Medical training is largely funded by scholarships provided by donor partners. Previously most of this training has been provided in Fiji, with internships available to all graduates. The past several years have seen a significant change in this model, with Cuba having provided in excess of 20 new graduates over the past three years. Taiwan is also providing medical student education (Tassicker et al., 2019). Inadequate opportunities for continuing education in Kiribati, geographical isolation, and reliance on foreign aid remain significant constraints in Kiribati nurses' ongoing education.

Current research on health issues in Kiribati

In recent years, there has been growing public health concern globally, particulalry regarding the impact of climate change on health. Pacific Island countries (PICs) are among the most vulnerable places on earth to climate change (WHO, 2015), which in turn threaten their already vulnerable socio-ecological conditions. Climate change is likely to have a significant so-called "multiplier effect, on population health by

exacerbating existing problems rather than posing new threats (Cauchi et al., 2019). The highest-priority climate-sensitive health risks in Pacific Island countries include trauma from extreme weather events, heat-related diseases, compromised safety and security of water and food, vector-borne diseases, zoonoses, respiratory illnesses, psychosocial ill-health, NCDs, population pressures, and health system deficiencies. Adaptation strategies related to climate change and health risks can be clustered according to categories common to many countries in the Pacific region (Mclver et al., 2016).

In PICs, while some infectious diseases remain a significant burden, there is growing concern regarding NCDs. In Kiribati, the obesity rate among adults was 46% in 2016, the prevalence of diabetes among adults was 22% in 2014, and the prevalence of hypertension among adults was 21% in 2015. The smoking rate among males aged 15 years and older was 59% in 2016 (WHO, 2018). Further, the death due to NCDs, such as heart disease, cerebrovascular disease, diabetes, and hypertension, is increasing yearly, reaching 72.81% in 2019 (World Bank, 2020). These statistics are among the highest in the world. A single reason cannot explain the increase in NCDs, but a change in diet is one of the major factors. Diets in PICs, including Kiribati, have undergone a major transformation in recent history, with energy-dense, nutrient-poor processed foods largely replacing traditional whole foods (Sahal Estimé et al., 2014).

In Kiribati and other PICs, it is necessary to consider people's behavioral patterns, social environment, and cultural and historical background when develop interventions and policies that address their health issues, including measures that address NCDs with a high burden of disease. Malakai et al. (2021) conducted focus group interviews with diabetic patients in Kiribati. They found that health system failures to meet these patients' complex health care needs and health care service gaps are apparent. However,

there are few studies on people's perceptions and cultural backgrounds.

CHAPTER III: PRELIMINARY STUDY

People-Centered Care: Concept Analysis

Relationship between Preliminary Study and Main Doctoral Study

Underlying the Fostering "Goal-Driven Actor" Project is the problem-solving method, and the most prioritized idea in problem-solving is "customer first." The first thing that is considered to put the customer first is the customer's apparent or latent needs (Furuya, 2013). This concept of problem-solving has already been widely adopted and practiced in the healthcare field, and I thought that the concept that means care based on "Customer first" in the healthcare field could be called people-centered care (PCC).

Introduction

The realization of PCC is said to be an essential element for achieving universal health coverage, and it is one of the concepts that have been attracting attention worldwide (WHO, 2017). Several initiatives based on PCC have been reported. There are many similar terms, such as patient-centered care, person-centered care, population-centered care, and integrated people-centered health service. However, their meanings and usage are unclear. In planning the doctoral study, I decided to reexamine the concept of PCC in light of recent global efforts and social conditions, and see if it can be used as a concept that serves as a basis for practicing problem-solving in the health care field.

Purpose

This study aims to identify the definition, attributes, antecedent requirements, and consequences of the concept of PCC. The results were used to make suggestions for improving the quality of care using problem-solving methods in primary health care practice.

Method

For the analysis of this concept, Rogers and Knafl's (2000) concept analysis approach was used. This approach has as its philosophical foundation the evolutionary perspective that concepts change and develop with time and context, and aims to explain and understand concepts socially and over time while paying attention to the context in which concepts are used and the changes in concepts (Hamada, 2017). I considered this method appropriate for this study, which aims to understand how concepts are used in this rapidly developing world and to obtain suggestions for nursing practice.

Data collection

The references were obtained from PubMed, EBSCO (CINAHL Plus with Full Text), Medline, EMBASE, PsycINFO, Japan Medical Abstracts Society (JAMAS), and Citation Information by the National Institute of Informatics (CiNii). The search terms were "people-centered care" or "people-centered." Furthermore, there were no restrictions on language or the year of publication. The search dates were from the oldest searchable year in each database to June 6, 2021. The titles and abstracts of 392 articles were checked to avoid duplication, and those that did not focus on PCC were excluded. As for the types of articles, original articles, research reports, practical reports, and commentaries were included, while published conference proceedings, including abstracts of research presented at conferences, were excluded. A manual search was performed to identify articles and various types of reports. In the selection of literature, one other student in the doctoral program in nursing and I worked independently and discussed before taking decisions when there were differences. Finally, 33 cases were included in the analysis (see Table 1).

Data Analytics

The literature to be analyzed was read carefully, and "attributes," which indicate the characteristics of PCC, "Antecedent requirement," which indicate the changes and contexts in which PCC occurs, and "Consequences," which are the events that occur as a result, were extracted on the coding sheet. The extracted contents of each of the "Attributes," "Antecedent requirements," and "Consequences" from the created coding sheets were summarized as codes; and similar codes were categorized. To improve the validity of the analysis, I received supervision from a researcher who has been conducting research and practice on PCC.

Results

As a result of the analysis, the following core themes were found: "People-initiated efforts to partner with health care providers to improve and enhance health issues for individuals and communities" as the attribute of this concept, "With the passage of time and the various changes in the way we are as a society and as individuals, care has spread to a variety of settings" as the antecedent requirement, and "The goals set by the people themselves, together with their health care providers, will be achieved and at the same time, there will be personal and social transformation" as a consequence. In the following, " " indicates the theme, 【】indicates the category, and [ ] indicates the subcategory. Table 2 presents the attributes, antecedent requirements, and consequences of PCC, along with the literature from which they were extracted.

Attributes: "People-initiated efforts to partner with healthcare providers to improve and enhance health issues for individuals and communities"

Four categories and 16 subcategories were extracted as attributes of this concept.

【The subject is people】 In PCC, the priority is that [people are respected as subjects

of health]. The approach is [based on partnerships between people and health care providers], and [access to health information that meets people's needs] is an essential element in various approaches. Various forms of [collaboration with communities] will also occur. Respecting people's autonomy means keeping the [presence of people from all social, economic, and cultural backgrounds] in mind.

【Approaches to improving and enhancing health issues】 Approaches to improving and enhancing health issues included [approaches to improving and enhancing health issues for individuals], [approaches to improving and enhancing health issues for the community], and [approaches to improve the health system].

【Relationships as a basis for partnership building】 To build a partnership, the first step is [mutual understanding]. Since a partnership is a relationship of equals, the first step in building a relationship is for both parties to know each other well, rather than one party collecting information from the other. To continue working together, it is also necessary to have [mutual trust]. The relationship of trust and being trusted continues based on [mutual understanding]. [Mutual respect] is also essential for building partnerships in activities.

【Behavioral Attitudes for Building Partnerships】 As the activities continue, both people and health care providers are [taking on each other's roles] that are appropriate to their positions and situations. While fulfilling their roles, they are [growing together]. People come to various decision-making situations, and each have the right and duty to participate in decision-making and [shared decision-making]. It is also important to [use each other's strengths] as equals, share the current situation and issues, think together, and [overcome problems together].

Antecedent requirement: "With the passage of time and the various changes in the

way we are as a society and as individuals, care has spread to a variety of settings"
Four categories and ten subcategories were extracted as antecedent requirements.

【Changes in social conditions】 In recent years, social conditions have changed dramatically. 【Changes in medical conditions] have been intense, and non-communicable diseases are on the rise worldwide, resulting in a significant increase in the burden of disease. Advanced medicine has developed rapidly, opening up many possibilities and expanding the range of options. As a result of these changes, [changes in population structure] are also advancing. While the aging of the population in developed countries has long been a focus of attention, the rapid aging of the population in Asian countries is also an urgent issue.

【Increasing people's ownership of their health】 [Diversification of subjective health views] is also advancing, as advances in medical technology have made it possible to diversify options to maintain and improve health while living with a disease. People at various levels of health are concerned about their health and this concern is increasing day by day. There are also [changes in the way people interact with health care] in this diversification. There is a growing movement to take care of one's health, and many people want to participate more actively in health care. However, there is a [gap between people and health care providers]. There is a gap in awareness of health issues and in knowledge and information between people and health care providers. The terms used by health care providers are often difficult for people to understand. Resultantly, there are [communication challenges between people and health care providers]. Miscommunication between people and health care providers is often pointed out, and many people do not feel that they are part of the team in health care.

【Health issues in modern society】 There are many [remaining challenges despite

advances in medical care]. Some people have difficulty accessing health care for various reasons, and these people are not receiving enough care. The quality of care is uneven, and patient safety may be threatened. Busy medical practices do not provide sufficient individualized attention. [People's emerging needs for health and health care] have also surfaced. With a vast amount of information and various options, there is a growing need for health counseling and support in decision-making. Older people living in the community have specific needs, and people living with diseases and disabilities have many needs.

【Care in a variety of settings】 [Expanding the role of health care providers] is underway. They provide care to not only patients but also the non-diseased. They also take up supporting problems that cannot be covered by medical institutions and connect them to medical institutions. Even in the medical field, there is a change in how we interact with patients. They are beginning to adopt a perspective that sees them not as patients but as people. [Diversification of fields of activity for health care providers] is advancing, and the need for care outside of health care institutions is increasing. Encounters between people and health care providers in the community are growing.

Consequence: "The goals set by the people themselves, together with their healthcare providers, will be achieved, and at the same time, there will be personal and social transformation."

As a consequence, three categories and seven subcategories were extracted.

【Achieving goals set by the people themselves】 PCC enables [access to health care with respect for autonomy]. People can make their own decisions and receive care according to their needs. Achieving the goal will also ensure [people can take the actions they want to realize].

【Self transformations of both people and healthcare providers】 [Changing people's mindset] enables them to take a more proactive view of their health and make decisions that are important to them in a way that makes sense to them. [Improving people's competence] includes improving health literacy, health knowledge, self-efficacy, and health behavior change. People are not the only ones whose competence is enhanced. To deliver care that meets people's needs is [improving the competence of health care providers]. It also means improved patient safety and satisfaction, and enhanced satisfaction for health care providers.

【Social transformations】 With the transformation of the individual comes [community empowerment]. As the community accumulates activities, the activities expand and develop themselves. The increase and expansion of social capital for health lead to the [transformation of the social system]. The development of health policies at the national level based on PCC will be reorganized to meet the people's care needs. These are social transformations that benefit people and the health system.

Discussion

Based on the analysis results, PCC was defined as "an initiative in which people step forward and partner with health care professionals to improve and enhance health issues in individuals and communities." In various social and individual changes, the realization of PCC is expected to result in the achievement of goals set by the people themselves together with health care professionals and the transformation of individuals and society. This definition does not deviate from the conceptual diagram of PCC constructed by Takahashi et al. (2017) and is thought to be captured in reports from overseas published after 2017 without significant differences in the central idea. Patient-centered care is a concept associated with PCC. The most distinguishing feature

of PCC from patient-centered care is that it does not limit its target to the patient. The focus is on the whole person, not just the person with the disease (WHO, 2010), and the target group includes not only the patient but also their family, friends, and community (Swan, et al.,2003; Odone, et al., 2018). The emphasis is on respecting the wishes of these people (Ariomori, et al., 2005).

The need for a broader view of the target population is also influenced by the diversification of health problems due to changes in social conditions (Eto, et al., 2006; Botin, et al., 2020). Even with the development of medicine, many health problems remain (Eto, et al., 2006; Lele, et al., 2020; Nakamura, et al., 2020; WHO, 2007), and new needs of people regarding health and healthcare (WHO, 2010; Takahashi, et al., 2007; Arimori, et al., 2009; Yoshino &Arita, 2013; Kamei, 2017a; Kamei, 2017b; Nakamura, et al., 2020). In response to these, the expansion of the role of healthcare professionals (Hishinuma, et al., 2007; Sakyo, et al., 2007; Matsutani, et al., 2007; Takahashi, et al., 2007; Takai, 2017; Takahashi, et al., 2018) and di-versification of activity sites (Arimori, et al., 2005; Hishinuma, et al., 2005; Komatsu, et al., 2005; Komatsu, et al., 2006; Hishinuma, et al., 2005; Sakyo, et al., 2007; Matsutani, et al., 2007; Takahashi, et al., 2007; Takai, 2017; Takahashi, et al., 2018) are advancing based on the concept of PCC. In some cases, PCC has been introduced into healthcare systems through a top-down process as a national policy; in others, it has been introduced as a small demonstration project and subsequently spread to other parts of the country (WHO, 2010). Integrating PCC into existing healthcare systems is important through diverse approaches. Such a trend would lead to improved patient safety and satisfaction. In this analysis, I emphasize the inclusion of the subcategory [presence of people from all social, economic, and cultural backgrounds] in the attributes. This content could

have been included in the subcategory [people are respected as subjects of health]. However, it is categorized as an independent subcategory because I believe that due to the diversification of the population, consideration of social, economic, and cultural backgrounds is becoming more important. Through PCC-based practices, people receive care that meets their needs and enables them to achieve goals based on their will. Personal change occurs for citizens and healthcare providers, leading to social change toward improving community empowerment and health issues (Takahashi, et al., 2018).

This study was peer reviewed to ensure that the validity of the results was supported. However, researchers' conceptual biases and rigor are limited. This concept is dynamic and does not provide a permanent definition (Rogers, 200).

While the concept of PCC is especially important in terms of people's ownership of their health, it is presumed that ownership of health is also highly influenced by healthcare circumstances and cultural background. The significance of the concept of PCC has been noted for many year (WHO, 2007), and it is expected that it will continue to be used in healthcare initiatives. It is important to validate this concept through PCC-based care.

Conclusion

The concept of PCC was analyzed using the concept analysis approach proposed by Rogers et al. This concept was defined as "an initiative in which people step forward and partner with health care professionals to improve and enhance health issues in individuals and communities." The realization of PCC is expected to achieve the goals set by the people themselves together with the health care providers and to transform individuals and society.

Implications for the main Doctoral Study

Understanding and implementing the concept of PCC in primary health care practice will also lead to effective care. The concept of PCC revolves around people proactively partnering with healthcare professionals to address health issues in both individual and community contexts. A cooperative attitude between the public and healthcare professionals is crucial (Takahashi, 2017). The findings from this conceptual analysis align with this perspective. A paramount concept in problem-solving, the "customer-first principle," emphasizes prioritizing both overt and latent needs of customers (Furuya, 2013). The most significant difference between the customer-first principle and PCC is that collaboration between producers and customers is not taken into account in the customer-first principle. However, both share the common goal of prioritizing the needs of the target audience over the convenience or one-sided desires of the service provider or producer. Because it is not appropriate to use customer first in the context of health care, the goal-driven actor program for workers involved in primary healthcare implemented in this study uses PCC as a problem-solving method rather than "customer-first principle.

Table 1

List of Target Literature

Author	Title	Journals, Volume (Issue), Pages/ URL	Year
Arimori, N., Eto, H., Omori, J., et al.	Strategic Practices for People-Centered Care Part I -Types of Partnership-	Journal of St. Luke's Society for Nursing Research, 13(2), 11-16. Japanese.	2009
Arimori, N., Komatsu, H., Nagae, H., et al.	Aspect of “People-Centered Care” Viewed through the Planning and Organization of a Series of Symposia	Journal of St. Luke's Society for Nursing Research, 9(1), 84-89. Japanese.	2005
Botin, L., Bertelsen, P. S., Kayser, L., et al.	People Centeredness, Chronic Conditions and Diversity Sensitive eHealth: Exploring Emancipation of the 'Health Care System' and the 'Patient' in Health Informatics.	Life (Basel), 10(12).	2020
Eto, H., Horiuchi, S., Sakyo, Y., et al.	Synchronizing the Essence of People-Centered Care and Experiences of Women with Wisdom and Courage: St. Luke’s College of Nursing 21st Century COE Program 5th International Relay Symposium	Journal of St. Luke's Society for Nursing Research, 10(1), 68-74. Japanese.	2006
Hishinuma, M., Kawagoe, H., Matsumoto, N., et al.	Health Information Service to the People at St. Luke’s College of Nursing: A Trial of “LUKENAVI”	Bulletin of St. Luke's College of Nursing, 31, 46-50. Japanese.	2005
Hishinuma, M., Matsutani, M., Tashiro, J., et al.	Development of a Health Education Program for Five-year-olds: “Let's learn about our body!”-The Process of Research Aiming to Promote People-centered Care-	Bulletin of St. Luke's College of Nursing, 32, 51-58. Japanese.	2006

Kamei, T.	What is People-Centered Nursing Care in a Super-Aging Society?	Journal of St. Luke's Society for Nursing Research, 21(1), 48-50. Japanese.	2017
Kamei, T.	[People with Dementia and Home Care] Home Care for People with Dementia and a Multidisciplinary Approach from the Perspective of People-Centered Care.	Journal of Japanese Society for Dementia Care, 15(4), 737-744. Japanese.	2017
Kamei, T., Takahashi, K., Omori, J., et al.	Toward Advanced Nursing Practice along with People-Centered Care Partnership Model for Sustainable Universal Health Coverage and Universal Access to Health.	Revista Latino-Americana de Enfermagem (RLAE), 25, 1-10.	2017
Komatsu, H.	People-centered initiatives in health care and health promotion.	Japan Journal of Nursing Science, 1(1), 65-68.	2004
Komatsu, H.	Mid-term report on St Luke's College of Nursing's 21st century Center of Excellence Program: core elements and specific goals of people-centered care.	Japan Journal of Nursing Science, 3(1), 71-76.	2006
Komatsu, H.	Five years activities of St. Luke's College of Nursing 21st Century COE program: Creation of People-Centered Care.	Japan Journal of Nursing Science, 5(2), 137-142.	2008
Komatsu, H.	Process of developing people-centered care.	Japan Journal of Nursing Science, 5(2), 117-122.	2008
Komatsu, H., Murakami, Y., Matsuzaki, N., et al.	For Taking Initiative in Our Own Healthcare: Patient-Centered Approach to Breast Center Team Care: The 3rd Report of COE International Relay Symposia	Journal of St. Luke's Society for Nursing Research, 10(1), 61-67. Japanese.	2006
Komatsu, H., Nagae, H., Ohta, K., et al.	Essence of People-Centered Care that binds St. Luke’s College of Nursing COE International Relay Symposia	Journal of St. Luke’s Society for Nursing Research, 9(1), 76-83. Japanese.	2005

Lele, R. D., & Patwardhan, B.	Transiting from pathy-based to people-centered holistic healthcare.	J Ayurveda Integr Med, 11(3), A1-a3.	2020
Liu, Z.	Patient Engagement at the Household Level: A Feasible Way to Improve the Chinese Healthcare Delivery System Toward People-Centred Integrated Care.	Camb Q Healthc Ethics, 27(3), 408-420.	2018
Matsutani, M., Hishinuma, M., Sakyo, Y., et al.	Evaluation of Health Education Program for Five-year-olds "Let's Learn about Our Body: Digestive System"	Bulletin of St. Luke's College of Nursing, 33, 48-54. Japanese.	2007
Nakamura, M., Takahashi, K., Ota, E., et al.	Initiatives on" Specialized Nursing Consultations" for the Community Established by St. Luke's International University and Associated Challenges	Bulletin of St. Luke's International University, 6, 86-90. Japanese.	2020
Odone, A., Roberts, B., Dara, M., et al.	People- and patient-centred care for tuberculosis: Models of care for tuberculosis.	International Journal of Tuberculosis and Lung Disease, 22(2), 133-138.	2018
Omori, J., Takahashi, K., Ushiyama, M., et al.	Strategic Practices for People-Centered Care Part II – Outcomes That Grow Along with Activities-	Journal of St. Luke's Society for Nursing Research, 13(2), 17-24. Japanese.	2009
Sakyo, Y., Matsutani, M., Yamazaki, Y., et al.	The Developing Process of People-centered Care in Relay Symposium: The report of St. Luke's College of Nursing 21th Century COE Program 7th International Relay Symposium "Let's Learn about Our Body with Children!"	Journal of St. Luke's Society for Nursing Research, 11(1), 116-124. Japanese.	2007
Swan, W. I., Vivanti, A., Hakel-Smith, N.et al.	Nutrition Care Process and Model Update: Toward Realizing People-Centered Care and Outcomes Management.	Journal of the Academy of Nutrition and Dietetics, 117(12), 2003-2014.	2017

Takahashi, K., Asazawa, K., Arimori, N., et al.	Development of People-Centered Care Partnership (PCCP)-16 Scale:Reliability and Validity of the Scale from a Viewpoint of Collaboration between Community Members and Healthcare Providers	Japan Academy of Nursing Science, 40, 620-628. Japanese.	2020
Takahashi, K., Hishinuma, M., Ishikawa, M., et al.	Characteristics of the Users of Health Consultaion Service Offered by a Nurising College	Journal of St. Luke's Society for Nursing Research, 11(1), 90-99. Japanese.	2007
Takahashi, K., Kamei, T., Omori, J., et al.	Restructuring the Concept of“ People-Centered Care” Promoting Partnerships between Community Members and Health Care Providers	Bulletin of St. Luke's International University, 4, 9-17. Japanese.	2018
Takai, K.	Putting People, Not Patients, at the Center of Clinical Nursing Care: PCC in Hospitals and Clinical Practice: People-Centered Nursing Care Needed in Various Settings.	Journal of St. Luke's Society for Nursing Research, 21(1), 62-63. Japanese.	2017
World Health Organization	People-centred and integrated health services: an overview of the evidence: interim report.	https://apps.who.int/iris/handle/10665/155004, [Accessed 9 Jul 2023].	2015
World Health Organization.	PEOPLE-CENTRED CARE IN LOW- AND MIDDLE-INCOME COUNTRIES.	https://apps.who.int/iris/bitstream/handle/10665/155004/WHO_HIS_SDS_2015.7_eng.pdf, [Accessed 9 Jul 2023].	2010
World Health Organization. Regional Office for the Western Pacific	People-Centred Health Care: A policy framework.	https://apps.who.int/iris/handle/10665/206971, [Accessed 9 Jul 2023].	2007

Table 2

Attributes, antecedent requirements, and consequences of the concept of People-centered Care

Attributes: "People-initiated efforts to partner with healthcare providers to improve and enhance health issues for individuals and communities."			
Category	Subcategory	Contents	References
The subject is people	People are respected as subjects of health	・The main character of health is the person himself/herself. ・The subject of care is not only the person himself/herself, but also his/her family, friends, and the community. ・Care that respects the wishes of the people ・The role of healthcare providers is to coordinate and support the care.	Arimori et al. (2005), Hishinuma et al. (2005), Kamei (2017b), Komatsu (2004), Odone et al. (2018), Sakyo et al. (2007), Swan et al. (2017), Takai (2017), Takahashi et al. (2007), Matsutani et al. (2007),Yamada (2004), WHO (2010), WHO WPRO (2007), WHO WPRO (2008)
	Based on partnerships between people and health care providers	・Partnership between people and health care providers. ・Equal and two-way relationship	Arimori et al. (2005), Arimori et al. (2009), Eto et al. (2006), Hishinuma et al. (2005), Kamei (2017b), Komatsu (2005), Komatsu et al. (2005), Komatsu (2008a), Komatsu (2008b), Nakamura et al. (2020), Swan et al. (2017), Yoshino & Arita (2013), WHO WPRO (2007),

			WHO (2010)
	Access to health information that meets people's needs	・Words that people can understand ・Generate and provide appropriate information that meets people's needs and demands.	Komatsu et al. (2005), Sakyo et al. (2007), Takahashi et al. (2007), WHO WPRO (2008)
	Collaborate with communities	・Systematic involvement of the community ・Involve community health workers and trained volunteers ・Involving the community in policy making ・Expansion and development of organized care	Komatsu (2005), Komatsu (2008a), Komatsu (2008b), Liu (2018), Yamada (2004), WHO WPRO (2007), WHO WPRO (2008), WHO (2010), WHO (2015)
	Presence of people from all social, economic, and cultural backgrounds	・Understand people's social, economic, and cultural backgrounds and values ・Consideration for non-medical and spiritual aspects ・Be accessible to everyone.	Botin et al. (2020), Kamei (2017b), Lele & Patwardhan (2020), Odone et al. (2018), Takahashi et al. (2007), WHO WPRO (2007), WHO WPRO (2008)

Approaches to improving and enhancing health issues	Approaches to improving and individual enhancing health issues	・Symposium on health ・Creating a place to provide health-related information ・Collaboration between people and healthcare providers. ・Support programs for people with health issues and their families ・Programs to improve adherence to treatment ・Training for healthcare providers.	Arimori et al. (2005), Arimori et al. (2009), Eto et al. (2006), Hishinuma et al. (2005), Hishinuma et al. (2006), Kamei (2017a), Kamei (2017b), Komatsu et al. (2005), Komatsu et al. (2006), Matsutani et al. (2007), Nakamura et al. (2020), Sakyo et al. (2007), Swan et al. (2017), Takahashi et al. (2007), Takai (2017), Yoshino & Arita (2013), WHO (2010)
	Approaches to improving and enhancing health issues for the community	・Group activities of parties concerned ・Cooperation between health care researchers and practitioners and the community ・Training for health care providers. ・Training for community members.	Arimori et al. (2009), Omori et al. (2009), Takahashi et al. (2018), WHO (2010), Yoshino & Arita (2013)
	Approaches to improve the health system	・Formulate health policy at the national level	Botin et al. (2020), Lele & Patwardhan (2020), WHO WPRO (2007), WHO (2010)
Relationships as a basis for partnership	Mutual understanding	・People and healthcare provider understand each other	Eto et al. (2006), Kamei et al. (2017), Komatsu et al. (2005), Sakyo et al. (2007), Takahashi et

building			al. (2018), Takahashi et al. (2020)
	Mutual trust	・People and healthcare provider trust each other without anxieties.	Kamei et al. (2017), Komatsu et al. (2005), Takahashi et al. (2018), Takahashi et al. (2020)
	Mutual respect	・People and healthcare provider respect each other	Kamei et al. (2017), Takahashi et al. (2018), Takahashi et al. (2020)
Behavioral Attitudes for Building Partnerships	Taking on each other's roles	・People and health care providers play a role in each other.	Takahashi et al. (2018), Takahashi et al. (2020)
	Growing together	・People and healthcare provider grow and learn from each other	Arimori et al. (2005), Kamei et al. (2017), Komatsu et al. (2006), Takahashi et al. (2018), Takahashi et al. (2020)
	Shared decision making	・People and health care providers have the right and obligation to participate in decision-making and to share in decision-making.	Kamei et al. (2017), Kamei (2017a), Takahashi et al. (2018), Takahashi et al. (2020), WHO WPRO (2007)
	Using each other's strengths	・People and health care providers make the most of each other's strengths on an equal footing	Kamei et al. (2017), Takahashi et al. (2018), Takahashi et al. (2020)

	Overcoming problems together	・People and health care providers share the current situation and challenges, think together, and overcome the challenges together.	Kamei et al. (2017), Komatsu et al. (2005), Komatsu et al. (2006), Sakyo et al. (2007), Takahashi et al. (2018), Takahashi et al. (2020)
Antecedent requirement: "With the passage of time and the various changes in the way we are as a society and as individuals, care has spread to a variety of settings."			
Category	Subcategory	Contents	References
Changes in social conditions	Changes in medical conditions	・Increasing burden of disease due to global rise in non-communicable diseases ・Development of advanced medicine	Botin et al. (2020), Eto et al. (2006), Komatsu (2005), Liu (2018), WHO (2015), WHO WPRO (2007), WHO WPRO (2008), Yamada (2004)
	Changes in population structure	・Aging in developed countries ・Rapid aging in Asian countries	Hishinuma et al. (2005), Hishinuma et al. (2006), Kamei (2017a), Kamei et al. (2017), Komatsu (2005), Komatsu et al. (2006), Lele & Patwardhan (2020), Liu (2018), Nakamura et al. (2020), Takahashi et al. (2007)

Increasing people's ownership of their health	Diversification of subjective health views	・Diversification of options through the evolution of medical technology ・Aims to maintain and promote health in society while having a disease ・Growing concern and interest in health	Hishinuma et al. (2005), Kamei (2017a), Komatsu (2005), Komatsu et al. (2005), Komatsu (2008b), Nakamura et al. (2020), Sakyo et al. (2007), Takahashi et al. (2007), WHO (2010), WHO (2015), WHO WPRO (2007)
	Changes in the way people interact with health care	・The movement to take care of one's own health ・Many people want to be more actively involved in their health care.	Arimori et al. (2005), Hishinuma et al. (2005), Hishinuma et al. (2006), Kamei (2017b), Komatsu et al. (2005), Komatsu et al. (2006), Komatsu (2008b)
	Gap between people and health care providers	・Differences in perception of health problems between people and healthcare providers. ・Differences in knowledge and information between people and healthcare providers ・Difficulty for people to understand terms used by healthcare providers.	Arimori et al. (2005), Hishinuma et al. (2005), Takahashi et al. (2007), Takai (2017), WHO (2010)
	Communication challenges between people and healthcare providers	・Miscommunication between people and healthcare providers. ・Many people do not feel like they are part of a team in healthcare.	Arimori et al. (2005), Komatsu et al. (2005), Komatsu et al. (2006)

Health issues in modern society	Remained challenges despite advances in medical care	・Some people have difficulty accessing healthcare. ・Variability in quality of care ・Patient safety may be at risk. ・Difficult for medical institutions to provide adequate individualized support.	Eto et al. (2006), Lele & Patwardhan (2020), Nakamura et al. (2020), WHO WPRO (2007)
	People's emerging needs for health and health care	・Needs for health counseling ・Needs for support in decision-making ・Care needs for elderly people living in the community ・Needs of people with diseases and disabilities	Arimori et al. (2009), Kamei (2017a), Kamei (2017b), Nakamura et al. (2020), Takahashi et al. (2007), WHO (2010), Yoshino & Arita (2013)
Care in a variety of settings	Expanding the role of healthcare providers	・Care for non-diseased subjects・Ability to assist with issues that were not covered by medical institutions・Function of connecting to medical institutions・New ways to interact with people in clinical settings	Hishinuma et al. (2006), Matsutani et al. (2007), Sakyo et al. (2007), Takai (2017), Takahashi et al. (2007), Takahashi et al. (2018)
	Diversification of fields of activity for healthcare providers	・Care in non-medical settings ・Encounters between peopleand healthcare providersin the community	Arimori et al. (2005), Hishinuma et al. (2005), Hishinuma et al. (2006), Komatsu et al. (2005), Komatsu et al. (2006), Matsutani et al. (2007), Sakyo et al. (2007), Takai (2017), Takahashi et al. (2007), Takahashi et al. (2018)

Consequence: "The goals set by the people themselves, together with their healthcare providers, will be achieved, and at the same time, there will be personal and social transformation."			
Category	Subcategory	Contents	References
Achieving goals set by the people themselves	Access to health care with respect for autonomy	・People can make their own decisions that they are comfortable with. ・Ensure that people have access to health care that meets their needs	Eto et al. (2006), Kamei et al. (2017), Kamei (2017b), Lele & Patwardhan (2020), Takahashi et al. (2018), WHO (2015), WHO WPRO (2007), Yamada (2004)
	People can take the actions they want to realize	・People can transmit the voice of the party to society. ・People can maintain and improve their social health. ・People can continue to live where they want.	Arimori et al. (2005), Kamei (2017a), Takai (2017), Yoshino & Arita (2013), WHO WPRO (2007)
Self transformations of both people and healthcare providers	Changing people's mindset	・People can think proactively about their own health. ・People make decisions that are important to them in a way that makes sense to them.	Komatsu (2004), Komatsu et al. (2005), Matsutani et al. (2007), Nakamura et al. (2020), Omori et al. (2009), WHO WPRO (2008)
	Improving people's competence	・Improving people's health literacy ・Improving people's knowledge about health ・Improving people's self-efficacy ・Transformation of people's health behavior	Eto et al. (2006), Hishinuma et al. (2006), Kamei (2017b), Komatsu et al. (2005), Komatsu (2005). Liu (2018), Nakamura et al. (2020), Odone et al. (2018), Omori et al. (2009), Sakyo et al.

			(2007), Takahashi et al. (2018), Yoshino & Arita (2013), WHO WPRO (2008)
	Improving the competence of healthcare providers	・Care will be tailored to people's needs. ・Improve patient safety and satisfaction ・Improving the self-efficacy of healthcare providers. ・Improve satisfaction of healthcare providers.	Kamei (2017b), Komatsu et al. (2005), Komatsu et al. (2006), Komatsu (2008a), Odone et al. (2018), Takahashi et al. (2018), Takai (2017), WHO (2010), WHO WPRO (2007), Yamada (2004), Yoshino & Arita (2013)
Social transformations	Community empowerment	・The entire community is empowered to build on, expand, and develop their activities.	Arimori et al. (2005), Eto et al. (2006), Hishinuma et al. (2006), Kamei (2017a), Komatsu (2005), Sakyo et al. (2007), Yamada (2004), Yoshino & Arita (2013)
	Transformation of the social system	・Leading to an increase and expansion of socially relevant capital for health ・Restructure the health care delivery system to focus on meeting the health care needs of individual patients and their families. ・Benefiting people and health systems in countries of all income levels around the world	Botin et al. (2020), Kamei et al. (2017), Komatsu (2005), Komatsu (2008a), Lele & Patwardhan (2020), Liu (2018), Omori et al. (2009), Takahashi et al. (2018), WHO (2015), WHO WPRO (2007)

CHAPTER IV: METHOD

Positioning of this research in the Kaiketsu project

The Kaiketsu project is a collaboration with the WHO WPRO and St. Luke's International University. The researcher, Aya Nitamizu, was recognized by the WHO WPRO as the principal researcher, who would primarily implement the project. My specific role was to liaise with WHO WPRO personnel, develop a detailed plan as described in this research outline, conduct preliminary research, organize and evaluate e-learning and workshops, and publish a series of plans, implementation documents, and evaluations.

Research design

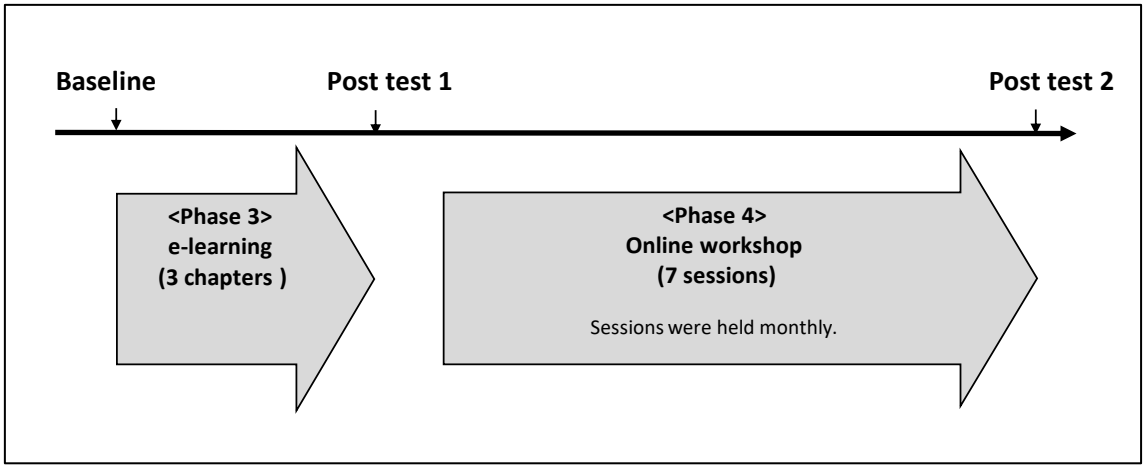
This study was designed as a four-phase feasibility study. I evaluated the pre-workshop e-learning program (e-learning part 1), the workshops, which include the workshop itself and the e-learning part 2 to assist with it, and the overall project for the primary healthcare workforce in Kiribati.

The four phases were as follows. Phase 1 was an inductive qualitative descriptive study using semi-structured interviews with the health workforce and allied professionals responsible for the practice or management of primary health care in Kiribati. These interviews identified the challenges and needs of the primary health care workforce in Kiribati and provided basic data for developing a culturally sensitive educational program. The educational program is reflected in the Phase 1 results. The Research Ethics Review Committee of St. Luke's International University, Japan approved this study (approval number: 21-A035). Phase 2 involved the creation of e-learning part 1 content that was intended to provide basic knowledge to improve healthcare workers' ability to achieve care goals. Phase 3 involved conducting the e-learning program and

evaluating the efficacy and viability of the content. In Phase 4, the online workshop for the Kaiketsu project was conducted and evaluated. For Phases 3 and 4, the permission of the ethical review board at St. Luke's International University (approval number: 22-A001) was obtained. Figure 1 shows the timeline of the intervention and evaluation in this study.

Figure 1

Intervention and evaluation timeline

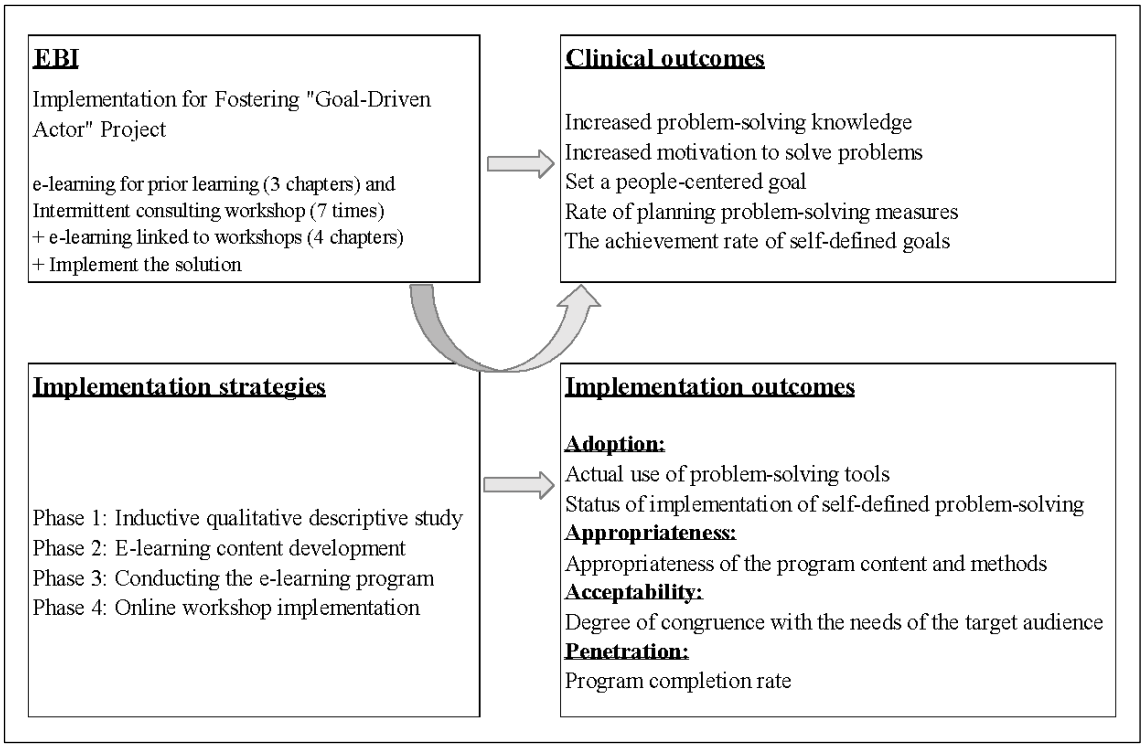


A goal-driven actor approach is one of the quality control methods used in the manufacturing sector. Nagoya University implemented this approach to conjoin quality control and medicine in a project called “Fostering Physicians for the Quality Improvement of Tomorrow’s Medicine” or ASUISHI. Currently, Nagoya University is contributing to medical safety by providing training in an expanded version of this program (Department of Patient Safety Promotion, Nagoya University Medical School Hospital, 2021). Our project’s program was designed based on this successful example. In addition, PCC, which is an essential concept for achieving universal health coverage, was included in our program. Through workshops, program participants were expected

to plan and implement action plans for problem-solving that reflect the PCC philosophy. Figure 2 shows the conceptual model for future projects, including this study.

Figure 2

Implementation strategies for organizational change



Tables 3 and 4 present the measurement tools, data collection methods, and the timing of the data collection used to measure this study's clinical and implementation outcomes. Details are provided in the Phase 3 and Phase 4 sections.

Table 3

Measurement tools, data collection methods, and timing of data collection used to measure clinical outcomes

Clinical Outcomes	Measurement tools	Data Collection Method	Data collection period		
			Baseline	Post-test1	Post-test2
Increased problem-solving knowledge	Percentage of correct answers in examinations (four-way format)	Questionnaire	○	○	
Increased motivation to solve problems	Ordinal scale (4-point Likert) and free responses.	Questionnaire			○
Setting people- centered goals	Considering the intent of the selected topic and goal setting from presentation and proposal.	Observation			○
Rate of planning problem-solving measures	Percentage of developed action plans to problems set by participants.	Observation			○
Achievement rate of self-defined goals	Percentage of goals achieved relative to set goals.	Observation			○

Table 4

Measurement tools, data collection methods, and timing of data collection used to measure implementation outcomes

Implementation Outcomes		Measurement tools	Data Collection Method	Data collection period	
				Work shop	Post-test2
Adoption	Actual use of problem-solving tools	Kaiketsu tools used, number of participants who used each tool, and Kaiketsu steps used.	Observation	○	
	Status of implementation of self-defined problem-solving	Documentation and comments by participants (reports of practices in the workshop, interim presentations, and final presentations)	Observation	○	
Appropriateness	Appropriateness of program content and methods	Ordinal scale (4-point Likert) and free responses	Questionnaire		○
Acceptability	Degree of congruence with the target audience's needs	Ordinal scale (4-point Likert) and free responses	Questionnaire		○
Penetration	Program completion rate	E-learning (Part 1 & 2): Completion rate of viewing the provided content	E-learning: Record of the e-		○

		Workshops: Participation rate for workshops held (participation is defined as reporting on practices and receiving feedback)	learning system Workshops: Observation		

Phase 1: Inductive qualitative descriptive study

Purpose of this phase

The purpose of this phase was to identify the issues and needs of primary health care nurses in Kiribati, and to obtain basic data for the development of culturally relevant and appropriate problem-solving programs that meet their needs.

Phase 1 research design

Phase 1 consisted of an inductive, qualitative descriptive study, using semi-structured interviews with the healthcare workforce and allied professionals responsible for the practice or management of primary health care in Kiribati. Due to the precautionary measures that were in place during the COVID- 19 pandemic, an online interview tool (Zoom) was used. The primary purpose of qualitative descriptive research is to understand the phenomenon under study by describing it. This research design was appropriate for the present study, which sought to identify the issues and needs of primary healthcare nurses in the western Pacific area, where no previous related research has been conducted.

Target population

The target population for the interviews was selected based on the inclusion criteria described below. Selections were made with the cooperation of the WHO Kiribati Liaison Office and the Kiribati Ministry of Health and Medical Services (MHMS). Those who met all four criteria were included in the study.

1. Healthcare workforce members responsible for practicing or managing primary healthcare in Kiribati and allied health professionals.
2. Those with access to the Internet and who could, thus participate in an online interview.

3. Those able to communicate in English.

4. Those who could willingly provide written consent to participate in the study.

No independent exclusion criteria were set. The expected number of participants was approximately five to ten individuals.

Facilities and recruitment methods

Data were collected from December 2021 to January 2022. Potential participants were recruited using snowball sampling, and those who expressed interest in the study were provided with a document explaining the research (see Appendix 1), which outlines the purpose, procedures, benefits, and drawbacks of participation. Research consent forms (see Appendix 2) and consent withdrawal forms (see Appendix 3) were created using Google Forms and sent along with the research explanation document. The research consent form included a section for inputting basic participant information as outlined in the interview guide (see Appendix 4). Participants who provided consent were considered research subjects. Documents such as research instructions and consent forms were prepared in English.

Research procedures

1. The date and time of the interview and the online interview tool to be used were coordinated and determined via email with the participants.

2. Before conducting the interviews, a private room was secured to safeguard and ensure the privacy and confidentiality of the interview.

3. Before starting the interview, the research purpose was explained again. The participants asked any questions they had, which were then answered. Thereafter, the participant’s basic information—obtained from the participation consent form—was confirmed.

4. A semi-structured interview, lasting between 30 to 60 minutes, was conducted using an interview guide. With the participant's consent, interview notes were taken, and the conversation was recorded with Zoom's recording function.

Analysis method

An accurate verbatim transcript was created from each Zoom recording. I then carefully read the verbatim transcripts and analyzed the participants' responses to obtain an overview of each research participant and understand the overall picture. Parts of the verbatim transcripts related to the theme " challenges faced by nurses and their needs" theme were extracted and organized. The research process was overseen by the research supervisor.

Ethical considerations

Protection of individual human rights. To protect the participants' rights, I complied with the Declaration of Helsinki and the Ethical Guidelines for Life Science and Medical Research Involving Human Subjects. A person's consent or refusal to participate in the research was not communicated to the referral source. Since this research was an interview survey, there were no direct interventions conducted on individual participants.

Timing, method, and content of informed consent. The content of the study, including the freedom to withdraw consent, was explained in writing to the research participants, and their written consent to participate in the study was obtained. In addition, I only commenced the interview after confirming that consent was obtained following another verbal explanation before the interview. The consent form was received via Google Forms and provided such that both the participant and I had an electronic record of the data. I kept the data under appropriate control.

Personal information protection and patient identification. To prevent identification of the participants, personal information was removed, consolidated, and anonymized, with proper nouns recorded as symbols. The corresponding tables were stored in a password-protected data file in Google Drive. All passwords were managed to ensure that only I could access the data.

Benefits to the participants. If a program is developed using the information obtained from the interviews, this intervention would meet the needs and cultural background of the research subjects themselves.

Risks and disadvantages arising from research participation and their considerations. There was a 10-minute constraint for entering basic information online in advance. In addition, the interview took about one hour to complete.

Medical treatment and compensation in the event of an accident. Due to the nature of the interview content, situations causing or furthering a participant's mental distress were not expected to arise during or after the interview.

Voluntary nature of research participation. Participation in this research was determined by the free will of the participants. Participants could withdraw their consent at any time. As noted, a "Research Participation Consent Withdrawal Form" (see Appendix 3) was provided as part of the research participation request, and withdrawal was accepted via Google Forms or email.

Costs incurred through research participation and who bears them. Research subjects may have been required to pay internet usage fees when using Zoom.

Publication. The results of this research are intended to be published as part of a doctoral dissertation and academic paper.

Conflict of interest. I have no conflict of interest to declare for this study. The study

was conducted with the approval of the Research Ethics Review Committee at St. Luke's International University (Approval No. 21-A035).

Phase 2: E-learning content development

Using e-learning in this study

The e-learning method was selected for the project because it allowed the participants, who were busy medical professionals, to learn at their convenience and in their respective settings. Moreover, when considering future development, it is advantageous that medical professionals working on remote islands, such as Kiribati, can access this e-learning program because they can learn anywhere as long as they have internet access.

Aim of the pre-workshop e-learning program (e-learning part 1) program

The e-learning Part 1 program aimed to promote self-education among healthcare professionals in basic PCC and problem-solving and motivate them to participate in the workshop.

E-learning program construction

The e-learning part 1 program consists of three chapters, with each chapter taking 10 to 20 minutes to complete in consideration of the burden on the participant's normal workload. Chapter 1 provides an overview of the entire program and an explanation of the PCC concept, which has a high affinity with the "customer-first" principle an essential aspect of the problem-solving approach. It is also a vital concept for primary health care. Therefore, PCC was selected as the initial content for this e-learning program. The PCC-related content was based on existing literature and was developed following advice from experts. Chapters 2 and 3 of the program encompass its positioning and the three elements of problem-solving as its basic components. These

aspects represent the basic knowledge required to participate in an online workshop that was to be held later. The study was based on the Japanese version of an e-learning video produced by Quality Creation Inc., and the use of the video, its arrangement, and the English translation were approved by this company. I also received supervision from the producer to ensure that changes in its arrangement did not compromise the content.

Procedure for developing the e-learning part 1 content

Developing the first half of Chapter 1 involved the creation and proofreading of original slides and English narration. The content of the second half was based on the Japanese version of the aforementioned e-learning video produced by Quality Creation, Inc. and adapted specifically for Kiribati nurses. The decision to use the original video as the foundation for the teaching materials was guided by the expertise of a problem-solving expert who had prior experience teaching healthcare professionals. Throughout the narration creation process, careful consideration was given to presenting examples and explanations in a manner that would be easily understandable to the target audience. Subsequently, a Japanese nurse with extensive overseas experience during schooling was enlisted to perform the English translation of the narration. For each chapter, the English narration drafts and slides underwent a thorough review and revision with WHO WPRO project staff. This process ensured consistency with previous content, uniformity of expression, clarity of explanation, and proper emphasis on the commentary's content. The final version of the materials was approved by the WHO WPRO project staff. The narration for the e-learning materials was accomplished using the read-aloud function provided by the e-learning system (described below). To enhance the slide visuals, a web designer was enlisted to create slide designs in alignment with our intentions. Additionally, an original illustration design was created

for the nurses in Kiribati, incorporating shades from the Kiribati national flag.

Building an e-learning system

An existing cloud-based e-learning system called “eden LMS” was used in this project. This system provides participants with the ability to watch e-learning videos and access necessary materials, which can be viewed and downloaded as required. The system also facilitates the management of each participant’s participation status, ensuring efficient tracking and monitoring of their progress.

Expenses

The WHO WPRO bore the costs of preparing the e-learning materials and system management incurred after Phase 2.

Phase 3: Conducting and evaluating the e-learning part 1 program

Phase 3 research design

The e-learning part 1 program aimed to motivate participants for the workshop that followed. A pre-and post-program knowledge test was conducted to evaluate the workshop, although I did not expect to improve participants’ knowledge solely through this material. The feasibility of the e-learning part 1 program was determined using process evaluations through qualitative descriptions from free-response comments made by the participants. The completion rate obtained from the e-learning system records was also considered.

Setting and participants

As was the case in the interviews, the target population for the e-learning part 1 program was selected based on the inclusion criteria described below. Selection was made with the cooperation of the WHO Kiribati Liaison Office and the Kiribati MHMS. Subjects

who met all four criteria were included in the study.

1. Health workers responsible for primary healthcare provision in Kiribati.
2. Those with access to the Internet and who could, thus use the e-learning system.
3. Those able to communicate in English.
4. Those who provided written consent participate in the program

No independent exclusion criteria were set. The expected number of participants was approximately five to ten individuals.

Facilities and recruitment methods

Candidate participants for this phase were also recruited using the snowball sampling method. Kiribati MHMS provided us with five management-level nurses as candidates, and we initiated contact with them through email. During the initial contact, I explained the research purpose and procedure, as well as the advantages and disadvantages of participation, using the research explanation document (see Appendix 5). The participation consent form (see Appendix 6) and withdrawal form (see Appendix 7) were created using Google Forms and sent to the participants together with the research explanation document. The participation consent form included a column for participants to input their basic information; if consent was obtained, the candidate was asked to input the necessary information and return the form. Those who consented were considered research participants. The documents provided to the participants were prepared in English.

Research procedures

The e-learning part 1 program was conducted from July 15 to August 16, 2022. The program comprises three chapters: Chapter 1 provides an overview of the entire program and an explanation of the PCC concept, while Chapters 2 and 3 focus on

explaining the three elements of problem-solving. Participants were asked to complete all sessions within one month. Instructions regarding the login process for the e-learnng system were provided to the participants via email, and their progress was monitored through the e-learning system. Participants were requested to take pre- and post-program knowledge tests before starting the e-learning part 1 program and upon completion. The knowledge tests were created using Google Forms (see Appendix 8).

Phase 4: Evaluation of the Kaiketsu project, including online workshop implementation and evaluation

Phase 4 research design

Based on the implementation of the Kaiketsu project to foster a goal-driven actor approach among the primary healthcare workforce in Kiribati, the following hypotheses were developed:

H1: The Kaiketsu project will increase participants' knowledge of problem-solving.

H2: The Kaiketsu project will strengthen participants' awareness of their roles as members of the healthcare workforce.

H3: The Kaiketsu project will increase participants' motivation for problem-solving.

The Kaiketsu project's goal was for healthcare professionals to work actively and effectively to solve health issues in the community, or more specifically, to plan and implement problem-solving measures. In Phase 4, I conducted a process evaluation and assessment of the adoption, appropriateness, acceptability, and feasibility of the entire program, which consists of entire e-learning and online workshops.

Setting and participants

The target population for the workshop was those who had completed Phase 3 of the e-learning part 1 program. The workshop was conducted online, with the expectation that

participants would join from their respective workplaces. However, considering the potential unreliability of internet access, it was decided that participants would primarily attend the workshop from the MHMS meeting room.

Content of the workshop

The online workshop was conducted using Zoom from August 2022 to March 2023. The workshop was organized by St. Luke's International University, and I was responsible for its management and facilitation as the host. In addition to the participants, the MHMS Nursing Division Director and WHO personnel attended the workshop as observers. The workshop instructor was Mr. Takeo Furuya, a problem-solving expert who supervised the entire e-learning program. The workshop was conducted in English, with the instructor utilizing a consecutive interpreter.

A total of seven workshops were held. Each workshop session lasted 2.5 hours, and sessions were held once a month. Table 5 provides an overview of the content of each session. At each session, participants were presented with an assignment to be completed by the following session, and they followed the session's content by practicing problem-solving in their workplace. In the workshop, participants presented the results of the tasks they worked on and discussed them with each other and with the instructor, working on solving the problems of their chosen topic.

Some tutors participated in the workshop. Their role was to support the participants in the online programs, facilitate communication during the workshops, and follow up with participants. There were no special requirement for the tutors; however, they understood the points of the workshop in advance.

During Sessions 1 through 4, we used e-learning to support participants in problem-solving. This e-learning program – referred to as E-learning Part 2 – was designed to

complement the workshop content, with explanations tailored to the specific steps covered in each session. It should be noted that this e-learning program was distinct from E-learning Part 1, which was conducted as a preparatory learning component in Phase 3. Participants were instructed to engage with the e-learning program at least once before the subsequent session. In the event of any questions from participants or additional advice from the instructor, the WHO representative and I acted as points of contact. We received and translated emails, forwarding them to the appropriate recipient, and similarly facilitated the received responses.

Table 5

Content of each session

Session	Date and Time (GILT)	Main contents
1st	August 16, 2022, at 1:30 pm	Interactive sessions between the instructor and each participant about awareness of work-related issues.
2nd	September 9, 2022, at 11:00 am	Interactive sessions between the instructor and each participant about understanding current situations.
3rd	October 19, 2022, at 11:00 am	Interactive sessions between the instructor and each participant according to their topics, such as gathering more necessary information or summarizing the collected data into a graph.
4th	November 15, 2022, at 1:30 pm	Presentation of the interim summary.
5th	December 20, 2022, at 1:30 pm	Interactive sessions between the instructor and each participant according to their topics, such as gathering more necessary information or summarizing the collected data into a graph.

6th	January 23, 2023, at 1:30 pm	Interactive sessions between the instructor and each participant according to their topics, such as gathering more necessary information or summarizing the collected data into a graph.
7th	March 14, 2023, at 1:30 pm	Final presentation.

Outcome measures

Before the e-learning part 1 course and at the end of it, an online self-administered questionnaire (see Appendix 8) was used to measure the participants' fundamental problem-solving knowledge. After the final workshop session, an anonymous self-administered questionnaire survey was provided to assess the outcomes. The questionnaire consisted of 23 questions measured on a 4-point Likert scale and free responses (see Appendix 9).

Problem-solving knowledge. Based on the advice of a problem-solving expert, I created a questionnaire to measure participants' fundamental problem-solving knowledge. The questionnaire was created using Google Forms, and names were replaced with research IDs to anonymize the responses for score management. This questionnaire consisted of 10 questions in a four-way format. When the participants logged into the e-learning system, they were prompted to answer a pre-test. After answering, the participants were given their scores and answers to each question. Once the three chapters are completed, the e-learning system prompts the participant to take the post-test immediately. The questions and choices were the same as in the pre-test. After answering, the participants were given their scores and answers to each question.

Appropriateness. I evaluated the appropriateness of both the content and the methods for the entire e-learning program and workshops. Participants' self-assessments of the adequacy of the learning time, readability of the materials, level of difficulty, and

relevance to their work were measured on a 4-point Likert scale. Participants provided their reasons for the rating of each item in free responses.

Acceptability. For the entire e-learning and workshops, the degree to which the program met the target audience's needs was assessed. Participants' self-assessments of unity and satisfaction were measured using a 4-point Likert scale. Participants provided their reasons for the rating of each item in free responses.

Penetration. Penetration was evaluated based on the completion rate of the entire e-learning program 3and workshop. The definition of participation in a workshop was presenting the results of working on an assignment and receiving feedback on them. The workshop participation rate was calculated using participation records, while e-learning program completion was measured using the e-learning system records.

Process evaluation and supplemental evaluation of implementation outcomes. For the process evaluation and supplemental evaluation of the implementation outcomes, the openended responses provided in the post-workshop questionnaire were analyzed. Interviews were also conducted with officials from Kiribati MHMS and WHO who were involved in the project. The recruitment and participation procedures for the interviews followed the same process as the Phase 1 interviews (see Appendix 10, 11, and 12). The interviews were conducted according to the interview guide (see Appendix 13), and participation was voluntary.

Statistical analysis

Descriptive statistics, such as means and standard deviations, were generated. A paired t-test for continuous variables was used to check the significance in the difference between the pre- and post-tests. All statistical analyses were performed using the

Windows version of the SPSS 29.0.1 software.

Ensuring the validity of the qualitative analysis

The concept of triangulation (Denzin, 1989) was used to ensure the validity of the qualitative data analysis. Specifically, data were collected from multiple sources and by various methods (ordinal scales, open-ended descriptions, interview data, etc.) to confirm its rationale. When categorizing the data, I provided a detailed description so that other researchers could judge the accuracy of the interpretation.

Ethical considerations.

Protection of individual human rights. I complied with the Declaration of Helsinki and the Ethical Guidelines for Life Science and Medical Research Involving Human Subjects to protect the participants' rights in this study. A person's consent or refusal to participate in the research was not communicated to the referral source. The research was conducted after receiving permission from the ethical review board at St Luke's International University, Japan (approval number: 22-A001).

Timing, method, and content of informed consent. The content of the study, including the freedom to withdraw consent, was explained in writing to the research participants and their written consent to participate in the study was obtained. The consent form was received via Google Forms and provided such that both the participant and I had an electronic record of the data. I kept the data under appropriate control.

Personal information protection and patient identification. To prevent the identification of the participants, personal information was removed, consolidated, and anonymized, with proper nouns being recorded as symbols. The corresponding tables were stored in a password-protected data file in Google Drive. All passwords were

managed to ensure that only I could access the data.

Benefits to the participants. By participating in this study, participants had the opportunity to learn the fundamentals of problem-solving techniques, which can help improve the quality of the health care they provide.

Risks and disadvantages arising from research participation and their considerations. The time burden was as follows. It took about 50 minutes to complete the e-learning part 1 program and take the pre- and post-tests. Each workshop took 2.5 hours to attend, and there were seven in total. In addition to the workshop time, participants had to work on assignments, and the time required varied from case to case. Time was required to be taken out of work hours to participate in the program. Since the program was offered online, participants may have borne cost for internet access.

Medical treatment and compensation in the event of an accident. Due to the nature of the intervention proposed in this study, situations causing or furthering a participant's mental distress were not expected to arise during or after the e-learning course.

Voluntary nature of research participation. Participation in this research was determined by the free will of the participants. Participants could withdraw their consent at any time. The participants were informed in advance that the program was being implemented by the WHO WPRO and St. Luke’s International University in cooperation with the Ministry of Health in Kiribati. They were also notified by email in advance that concerned parties would attend the workshop as observers.

Costs incurred through research collaboration and who bears them. Participants might have been required to pay usage fees when connecting to the Internet.

Publication. The results of this research are intended to be published in a doctoral dissertation and academic paper.

Conflict of interest. have no conflict of interest to declare for this study.

Researcher readiness. I have previous experience conducting a semi-structured interview survey of hypertensive patients in the Dominican Republic for my master's thesis. I also have sufficient expertise in practicing in low- and middle-income countries, having worked for two years in the Dominican Republic as a volunteer in charge of primary healthcare for the Japan International Cooperation Agency (JICA), and in the Plurinational State of Bolivia as a JICA short-term expert.

CHAPTER V: RESULTS

The purpose of this study was to develop and assess the feasibility of a goal-driven actor program for the healthcare workforce involved in primary healthcare in Kiribati. The program consisted of four phases: Phase 1 involved preliminary research for program development, Phase 2 focused on e-learning part 1 development, Phase 3 encompassed e-learning part 1 implementation and evaluation, and Phase 4 entailed the evaluation of the workshop implementation and overall program. There were a total of seven workshops, and I coordinated all of them from Japan. I also moderated all of the workshops from Japan except the final (seventh) workshop, which I moderated in the conference room of Kiribati MHMS. During my time in Kiribati, in addition to conducting the workshop, I visited hospitals and clinics under the purview of some of the participants. In this chapter, I summarize the information gathered during these field visits and then present the study results organized according to the different research phases.

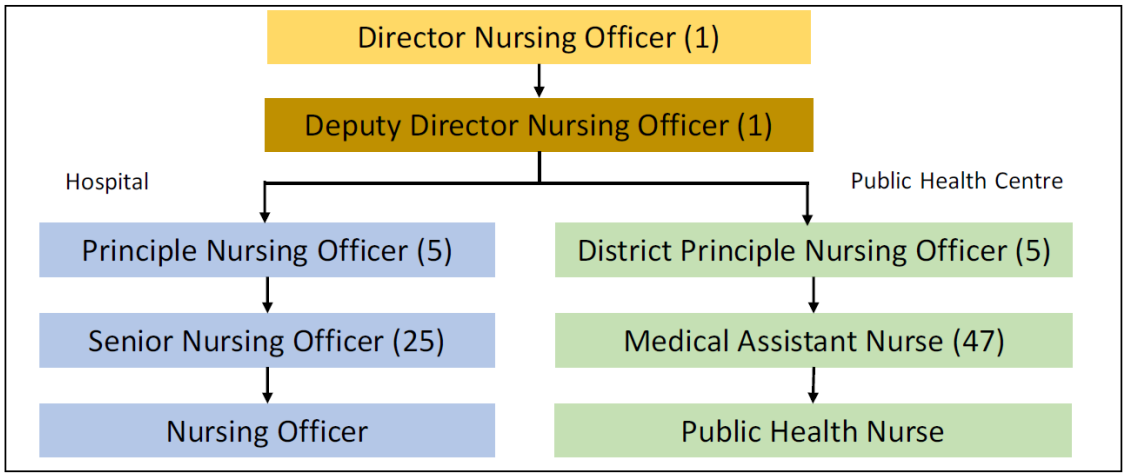
Overview of health and medical services in Kiribati (see Appendix 14)

The Kiribati MHMS has a hierarchical structure for its nursing workforce. The Director Nurse Officer (DNO) is responsible for overseeing the Nursing Division within the MHMS, and there is one Deputy Director Nurse Officer (DDNO). There are two main divisions within the MHMS: the Hospital Division and the Public Health Center Division. The Hospital Division is comprised of five Principa Nursing Officers (PNOs) and several Senior Nursing Officers and Nursing Officers who work under the supervision of the PNOs. The Public Health Center Division consists of five District Principa Nursing Officers (DPNOs) and a number of Public Health Nurses and Medical

Assistant Nurses who operate under the DPNOs. One of the PNOs or DPNOs also serves as the DDNO. The organizational structure of the nursing workforce in the Kiribati MHMS is illustrated in Figure 3.

Figure 3

Nursing Workforce Hierarchy in Kiribati MHMS



Tungaru Central Hospital. Tungaru Central Hospital was established in 1945 and is a Central Referral Hospital located in Tarawa, Kiribati's capital city. Over time, its role and functions have been strengthened, leading to the construction of the current hospital building in 1991 with funding from Japan. In 2005, a specialized care wing was opened within the hospital, also funded by Japan, focusing on providing medical services in highly specialized areas such as physiotherapy, tuberculosis, leprosy, hypertension, and HIV/AIDS. In 2016, an Intensive Care Unit (ICU) was constructed with funding from Taiwan. As of March 2023, there were ongoing expansion efforts in some of the hospital's wards. Tungaru Central Hospital has a total of 120 beds, but due to a shortage of beds, some patients had to be accommodated in tents set up on the hospital grounds. The inpatient wards lack air conditioning; thus, patients and their families must rely on

opening windows and using fans to cope with the heat. When advanced medical care is required that is beyond the capabilities of the hospital, patients are referred overseas. In cases of high urgency, patients may be transferred to neighboring countries such as Fiji. As far as I observed, medical records and nurse management records at the hospital are created by hand. In some instances, physicians record daily medical information in notebooks, and then manually transcribe the necessary data onto designated forms for monthly reporting to the MHMS.

Betio Hospital. Betio Hospital is a referral hospital located on Betio Island, which is connected to several islands including Tarawa Island, by the large causeway bridge and a main road, facilitating car travel between them. The hospital primarily serves the regions of Teaoraereke, Nanikaai, Bairiki, and Betio in South Tarawa. Betio Hospital offers a range of healthcare services including emergency care, general medical services, maternity care, pharmacy services, and dental services. The hospital has a dedicated staff of doctors, nurses, and pharmacists who provide care to patients. It also accepts referrals from health centers, enabling patients from these centers to access specialized care and treatment at the hospital. However, if the patient's medical condition requires a level of specialization that cannot be provided at Betio Hospital, they may be referred to Tungaru Central Hospital. In cases of high urgency, where immediate and advanced medical attention is required, patients may be transferred to neighboring countries such as Fiji.

Ambo Health Center. Ambo Health Center is one of 30 health centers located in Bairiki, Kiribati. It is situated at almost the midpoint of the main road that leads from Tarawa Island to Betio Island. The health center is staffed by registered nurses who have received additional training as medical assistants. These medical assistants play a

crucial role in delivering essential healthcare services and support to the local population. Ambo Health Center offers a range of services, including basic medical care, maternal care, family planning, district visits, and community home visits. The center also engages in educational activities to promote health and medical awareness among local residents. Nurses at the health center have created various informative posters that are displayed to educate visitors on important health topics. The center operates from 8:00 a.m. to 4:00 p.m. during weekdays, providing basic services to the community; however, the center ensures that emergency care is available 24 hours a day to promptly address urgent medical needs.

Phase 1: Inductive qualitative descriptive study

Results

Summary of Participants. Phase 1 of this study had four participants. One participant was responsible for primary healthcare management in Kiribati, two participants were affiliated with the WHO WPRO, and the remaining participant was associated with an office under the WHO WPRO that focuses on healthcare human resources and related issues in countries surrounding Kiribati.

Issues and Needs Facing Nurses. Based on the participants' remarks, it is evident that the geographical conditions in Kiribati and other Pacific-region countries often involve remote islands, and nurses working there are frequently the sole healthcare professionals available in the vicinity. These nurses face the challenges of their daily responsibilities and managing various work-related issues. Moreover, there is a chronic shortage of medical personnel, even in mainland areas.

Conclusion

Based on the participants' remarks, it is apparent that many nurses working in remote islands in Kiribati and other Pacific-region countries face significant daily challenges. They often must handle their responsibilities alone, highlighting their need to acquire problem-solving skills to effectively address work-related issues. To facilitate their learning, it is important to provide explanations with concrete examples that are clear and concise. Furthermore, emphasizing the universality of the problem-solving approach and its applicability to any field can help generate enthusiasm among the participants. By conveying this message, participants can understand that the skills they acquire will not only benefit them in their current roles but also have broader applications. Considering the possibility of unreliable internet connections during program implementation, it is advisable to establish a follow-up system using alternative means such as email. This will ensure ongoing support and communication even in situations where internet access is limited.

Phase 2: Development of e-learning content

The entire e-learning program was developed using a Japanese lecture video on problem-solving methods created by Quality Creation, Inc. and the information gathered during Phase 1. I created the initial draft of the Japanese version of the slides and narration. Subsequently, meetings were held with a faculty member, a researcher, and graduate students from the Global Health Nursing Laboratory at St. Luke's International University to discuss and exchange opinions on the Japanese narration script and slides. The objective was to ensure that the explanations and examples would be easy to understand for Kiribati nurses. After the slides were created, a Japanese nurse

with extensive overseas experience during schooling helped translate the narration into English. The English narration drafts and slides underwent review and revision by WHO WPRO project staff, with additional meetings held for each chapter to ensure consistency, clarity, and alignment with previous content. The final version was approved by the WHO WPRO project staff. In E-learning Part 1, Chapter 1 provided an overview of the program and introduced the PCC concept, which aligns with the customer-first approach inherent in problem-solving methods (Kaiketsu) and is essential in primary healthcare. Chapters 2 and 3 covered the three components of problem-solving. An overview of E-learning Part 1 is given in Table 6. E-learning Part 2 presented the eight steps of problem-solving and is shown in Table 7. The e-learning slides are included in Appendix 15.

Table 6

Summary of E-learning Part 1

Chapter	Title	Contents	Goals	Time (min: second)
1	Welcome to the Kaiketsu Program -Become a Kaiketsu expert-	An overview of the program and explanation of the concept of Kaiketsu.	✔ Understand the outline of this project ✔ Understand the definition of “problem” ✔ Understand the definition of “Kaiketsu” ✔ Understand the importance of PCC for Kaiketsu	10:33
2	The Three Elements of Kaiketsu (1)	Explain how to see and consider Kaiketsu.	✔ Understand the content of “The way to see and consider Kaiketsu”	10:55

3	The Three Elements of Kaiketsu (2)	Explain Kaiketsu steps and Kaiketsu tools.	✔ Understand the overview of the Kaiketsu steps ✔ Understand the purpose and use of important Kaiketsu tools that can be used in each step	19:44

Table 7

Summary of E-learning Part 2

Chapter	Title	Goals	Time (min: second)
1	"Select a topic" "Understanding the current situation"	✔ To be able to select a topic ✔ To understand the current context of the selected topic	11:09
2	"Goal setting" "Factor analysis"	✔ To become capable of setting your own goals ✔ To work on factor analysis on your selected topic	9:15
3	"Making action plans"	✔ To work on developing action plans for your topic. ✔ To organize the content from Step 1, "Select a topic," to Step 5, "Making action plans," in an implementation proposal	5:46
4	"Implementation of the plans," "Check effectiveness of the plans," and "Standardization and control"	✔ To be able to understand how to work on Step 6, "Implementation of the plans," Step 7, "Checking the effectiveness of the plans," and Step 8, "Standardization and control" in your own topic	9:46

Phase 3: Conducting and evaluating the e-learning part 1 program

Results

Summary of Participants. Phase 3 of this study had five participants, all of whom were PNOs, responsible for overseeing the hospital division within the MHMS nursing department. Each participant had jurisdiction over a specific region. Regarding their demographic information, one participant was in their 30s, two were in their 40s, and the remaining two were in their 50s. Regarding educational background, two participants had completed senior secondary school, while the other two held Bachelor's degrees from a university. Regarding their experience in primary health care, one participant had 1–3 years of experience, two had 3–5 years of experience, and two had more than 10 years of experience. The participants' basic characteristics are presented in Table 8.

Table 8

Participants' Characteristics

		N=5
Characteristics		n
Sex	Female	5
Age	30-39 years old	1
	40-49 years old	2
	50-59 years old	2
Highest educational qualification	Senior secondary school	2
	University (Bachelor)	3
Duration of engagement in primary healthcare	1 year to less than 3 years	1
	3 years to less than 5 years	2
	5 years to less than 10 years	0
	More than 10 years	2

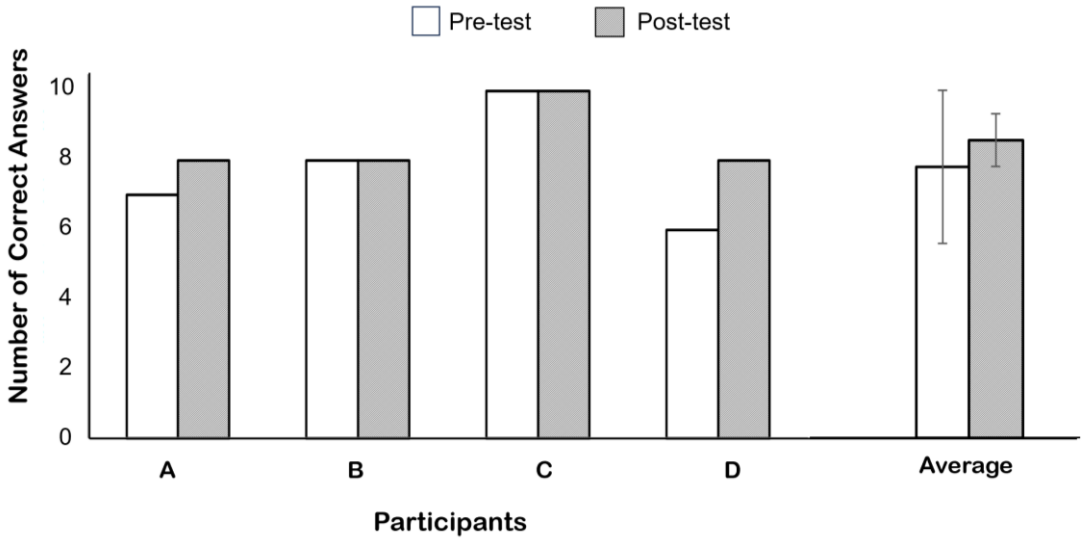
E-learning implementation. All participants attended all designated programs by the due date.

Clinical outcomes

Knowledge test. A pre- and post-course knowledge test consisting of 10 questions (four-way questions) was administered to five participants. Four participants completed both the pre- and post-tests. The mean score for the pre-test was 7.75 ± 2.18, and the mean score for the post-test was 8.50 ± 0.75. Correspondence t-tests were conducted to analyze the test results, revealing no significant differences between the conditions (p=0.215). Figure 4 illustrates the knowledge test scores for each participant.

Figure 4

Knowledge test scores for each participant



Evaluation. All five participants were motivated to participate in the subsequent workshops. A comprehensive evaluation was then conducted in Phase 4.

Phase 4: Evaluation of the Kaiketsu project, including online workshop implementation and evaluation

Results

Summary of Participants. In Phase 4 of the study, there were five participants, all of whom completed Phase 3.

Roles of the researcher and the implementing parties in the workshop. My role in the workshop comprised overall management and moderation. In terms of overall management, I monitored the participants' progress, mediated the communication between the participants and the instructor through their submissions and questions, assisted the participants in completing their assignments, guided the workshops, and took the workshop minutes. The seventh and final workshop took place in the conference room of the Kiribati MHMS, where I fulfilled my duties as moderator. Workshop assignments were submitted by participants to WHO WPRO staff via e-mail, which I received, translated, and sent to the instructor. I prepared the workshop agenda and workshop minutes. The agenda and minutes were sent to each participant and other participants through WHO WPRO staff. If a participant had a question for the instructor, WHO WPRO staff acted as point of contact by receiving the e-mail, which was then forwarded to me. I translated the email and sent it to the instructor, who translated the Japanese answer into English and sent the translated answer to the participant who asked the question via the WHO WPRO staff.

During the follow-up tutorial to the workshop, I provided explanations based on the instructor's advice, suggested methods for organizing the collected data into tables, and presented a video explaining common Excel operations. WHO WPRO staff, a professor, and a laboratory researcher from St. Luke's University Global Nursing Laboratory also

participated in the tutorial and offered advice on points they noticed. The laboratory researcher and graduate students helped with the workshop administration by assisting with the recording of the workshop, translating assignments submitted during the workshop, and managing the time for presentations.

Mr. Takeo Furuya, a problem-solving expert and the program supervisor, served as the instructor for all the workshops. Each session provided participants with 25 minutes of consultation time, during which Mr. Furuya offered feedback on the issues participants identified and guidance on the necessary steps to address them. Communication between the instructor and participants was facilitated through online consecutive interpretation. The assignments submitted by the participants were translated by a member of St. Luke's International University, using a combination of machine translation (Deepl) and human translation, and were subsequently shared with Mr. Furuya.

Details of the implementation each workshop (see Appendix 16). The first workshop was conducted on August 16, 2022. In addition to the five participants, there was one observer from the Kiribati MHMS, five participants from various WHO offices (Kiribati, Fiji, and WPRO), four staff members from St. Luke’s International University, and one interpreter. The workshop began with opening remarks, followed by introductions from the instructor and self-introductions from the participants. Each participant then presented their findings on the pre-task: “Awareness of work-related issues.” In each case, Mr. Furuya provided comments and guidance on the identified issues, as well as outlined the tasks to be completed by the next session.

In this workshop, each participant presented a specific issue relevant to their own work. Participant A highlighted staff shortages due to sick leave, maternity leave, and unpaid

leave for studying or staff accompanying their families studying overseas. Thus, the assigned tasks for Participant A were to 1) indicate the number of nurses working in the hospital each month for one year, and 2) indicate how many nurses left the workplace each month for one year.

Participant B highlighted problems with medicine orderin, such as delays or incorrect quantities, leading to patient complaints. Thus, the assigned tasks for Participant B were to 1) collect records of the medications ordered for one year, and to 2) check for any problems, such as delays or incorrect quantities.

Participant C highlighted the problem of test result being lost, where the results of MRIs, blood tests, and other tests could not be found. Thus, the assigned tasks for Participant C were to 1) provide a specific case of lost test results, and 2) capture the person involved, dates, and times of the case in chronological order as best as possible.

Participant D highlighted the low immunization coverage among the local target population, particularly children under one year. Thus, the assigned task for Participant D was to indicate the monthly diphtheria, pertussis, tetanus (DPT), and measles and rubella (MR) vaccination rates for one year.

Finally, Participant E highlighted the issue of overall staff shortages, where only six fixed staff members were available despite the need for eight nurses. Thus, the assigned tasks for Participant E were to 1) indicate the number of nurses per month for one year, and 2) indicate the number of overtime hours worked per month for the year.

The second workshop took place on September 9, 2022. There were four participants, with one participant absent due to work-related reasons. Other attendees included one observer from the Kiribati MHMS, four participants from various WHO offices (Kiribati and WPRO), five staff members from St. Luke's International University, and

one interpreter. During this workshop, participants were required to present their understanding of the current situation related to their chosen topics.

Using a PowerPoint presentation, Participant A reported on the number of staff and workforce management issues on a monthly and weekly basis in the surgical ward and ICU gynecology ward in 2021. The subsequent assigned tasks for Participant A were to 1) create a line graph representing the number of absences for each of the two wards (surgical ward and gynecology ward), with seven different lines for each ward; 2) discuss with colleagues the insights gained from the graphs; and 3) determine a goal based on the findings.

Participant B was absent from the workshop, and the subsequent assignment to create a diagram about the process of ordering and receiving medicine, including the responsible personnel, was conveyed to them separately.

Participant C gave a verbal report on the problem of missing lab results, forms, or samples in a village. The subsequent assignments for Participant C were to 1) capture the number of occurrences of missing samples, if possible; 2) collect information from staff members regarding incidents of lost samples and test results over the past six months, including the processes involved; and 3) refer to the e-learning course for guidance on visualizing and identifying all the processes, then create a process flow diagram. The instructor expected Participant C to collaboratively create the diagram with the people involved, including the responsible personnel.

Using a PowerPoint presentation, Participant D reported on MR2 and DPT coverage, both by clinic and island. The report highlighted significant differences in coverage rates among the clinics. The subsequent assignments for Participant D were to 1) obtain vaccination coverage data from other areas, 2) make a comparison between South

Tarawa and other areas, 3) note any health differences between each area and South Tarawa, 4) discuss potential factors influencing the differences in the coverage rates with stakeholders, 5) engage in discussions with colleagues and multiple stakeholders to identify possible causes or reasons for the coverage rate differences, and 6) set a goal for improved vaccination coverage.

Participant E gave a verbal report on the number of nurses and overtime hours from January to July 2022. Overtime work was consistently observed each week. The subsequent assignment for Participant E was to prepare a graph with the vertical columns representing each nurse (A, B, C, D, E, F) and the horizontal rows representing each week, starting from the first week of September.

During the workshop, Mr. Furuya provided guidance and feedback on the participants' presentations and assigned tasks, facilitating their understanding and progress in Kaiketsu methods.

The third workshop was conducted on October 19, 2022. There were four participants, with one participant absent due to work-related reasons. Other attendees included one observer from the Kiribati MHMS, four participants from various WHO offices (Kiribati, Fiji, and WPRO), five staff members from St. Luke’s International University, and one interpreter. During this workshop, emphasis was placed on presentations related to participants' topics, such as gathering additional necessary information or summarizing the collected data into graphs.

Participant A reported on the number of staff and workforce management status, particularly overtime, at the ICU and surgical ward in 2021. The subsequent assigned tasks for Participant A were to 1) calculate the percentage and add units to represent the overtime rates for the month of August, fixing the numbers for the graph (assuming

three staff members for the morning shift and two for the afternoon and night shifts); 2) explore the relationship between staff taking up overtime and the need for additional staff on certain days (four staff per shift); 3) record the frequency of critical cases requiring additional shifts based on existing data and create a graph to track overtime staff; 4) include action plans in the presentation; and 5) share the data with stakeholders and nurses.

Participant B was absent from the workshop.

Participant C created a process flow chart depicting the tests and procedures involved in handling samples, including sample collection, delivery to the laboratory, and return. Participant C also presented a line graph showing the number of sent, received, and missing specimens based on information obtained from interviews. The subsequent assigned tasks for Participant C were to 1) record the number of sample transportation occurrences between the hospital and the laboratory; 2) create a graph displaying the missing test results; 3) maintain a consistent record of the sent and missing samples; 4) identify and understand the current situation/problem by presenting data and discussing potential actions with stakeholders, connecting stakeholders and future steps; 5) analyze the current flow of blood sample testing and propose future improvements; and 6) aim to reduce the number of missing test results and blood samples to zero, while identifying factors contributing to the problem.

Participant D focused on vaccination coverage and compared rates between South Tarawa and four other islands using a graph. The participant received a suggestion to separate the graphs, highlighting the lowest coverage rates in the South Tarawa city area. Participant D also noted any health differences between South Tarawa and another area, presenting the information in a table. The subsequent assigned tasks for Participant

D were to 1) create one bar graph per island for each year (five separate graphs) to identify the characteristics of each island, 2) determine the prevalence of relevant diseases preventable by vaccines, and 3) develop a fishbone diagram with the title “Low Coverage Rate,” identifying keywords associated with the characteristics of the islands and applying them to the diagram. The fishbone diagram would be used to build a narrative, emphasizing important words to develop specific action plans.

Participant E presented the number of staff at South Tarawa Hospital per shift in August 2022 using a table and graph. The subsequent assigned tasks for Participant E were to 1) represent the percentage of overtime and annual leave compared to the total number of shifts using line charts for both the ICU and surgical ward, 2) calculate the number of annual leave days per staff member, 3) ensure consistency in the items displayed for both the ICU and surgical ward (e.g., annual leave, sick leave, etc.), and 4) identify the reasons for overtime occurrences, factors influencing them, and a target reduction rate for overtime, proposing potential action plans to address the issue.

The fourth workshop was conducted on November 15, 2022. There were four participants, with one participant absent due to work-related reasons. Other attendees included one observer from the Kiribati MHMS, three participants from various WHO offices (Kiribati, and WPRO), five staff members from St. Luke’s International University, and one interpreter. During this workshop, participants presented their mid-term summaries, focusing on the implementation proposals they had developed. Each participant delivered their presentation based on the materials they had prepared. and received comments from their supervisors and the instructor.

Participant A presented on the topic of “Shortage of staff” based on their implementation proposal. The supervisor commented that the same problem exists in

the main hospital, emphasizing the underlying issue of having too many patients. The supervisor also noted that the staffing system needs to be developed and shared relevant data, stating that 479 positions were registered in 2019, but 40 staff members had moved abroad. The supervisor also spoke positively of the 58 additional permanent positions that were approved that year. The instructor appreciated the abundance of collected data and suggested reconsidering the topic title to reflect the participant's specific focus. Further, the instructor emphasized the importance of presenting factual data on the current situation and visualizing it in an easy-to-understand graph. Therefore the subsequent assigned tasks for Participant A were to 1) use graphs to indicate the actual number of staff shortages, 2) examine the correlation between bed occupation rates and overtime, and 3) include as many factors as possible in the fishbone diagram. Participant B was absent for the third time.

Participant C did not submit an implementation proposal. Due to network limitations, there was insufficient opportunity for discussion, and thus, no feedback was provided by the supervisor or the instructor. Participant C planned to select a topic before the next workshop, considering options such as handling blood test results or emergency overflow.

Participant D presented on the topic, "Low coverage of the MR2 and DPT4 immunization program on South Tarawa," based on their implementation proposal. The supervisor expressed the need for extensive work in this area since coverage rates were not improving. The instructor commended the participant on effectively summarizing the output and suggested using available vaccination rates for comparison. The instructor also highlighted the importance of the graph titled "MR2 and DPT Report Trends for 2019 to 2021," which showed a correlation between the number of report

submissions and the coverage rate. Therefore, the subsequent assigned tasks for Participant D were to 1) select one available vaccine for comparison based on the vaccination rate, 2) remove assessments from the “Understanding the current situation” section and focus on listing facts, and 3) include the fact that the report submission rate may affect the vaccination rate in the fishbone diagram.

Participant E presented tables and graphs documenting the number of staff and overtime hours as of September 2022 as part of their assignment on “Understanding the current situation.” The supervisor noted the variation in overtime hours for each staff member, pointing out that the number of inpatients was missing, making the percentages unavailable. The supervisor suggested including the number of inpatients and staff ratios to make the status of overtime work more visible. The instructor commented on the importance of calculating overtime hours based on the desired focus and the need to inform about staff shortages. Therefore, the subsequent assigned tasks for Participant E were to 1) create a graph showing the actual number of staff needed or the hours of understaffing, seeking support from St. Luke’s and the WHO contact; and 2) use a fishbone diagram to visualize the current situation and aid in analyzing the factors. The materials submitted in the mid-term summaries are included in Appendix 17, with all personal information redacted.

The fifth workshop was conducted on December 20, 2022. There were four participants, with one participant absent due to work-related reasons. Other attendees included one observer from the Kiribati MHMS, five participants from various WHO offices (Kiribati, Fiji, and WPRO), five staff members from St. Luke’s International University, and one interpreter. During this workshop, presentations and feedback were conducted based on each participant’s progress.

Participant A presented a revised stacked chart of the staff roster in the surgical ward. Mr. Furuya suggested creating a graph to visualize the number of nurses missing each month and in each ward, providing an example graph for reference. The subsequent assigned tasks for Participant A were to 1) create a similar graph for each month from January to December, 2) describe what the graph represented, and 3) list ideas to improve work effectiveness based on the graph.

Participant B was absent for the fourth time.

Participant C presented on the topic, “Patient overflow in the emergency department.” Since the data from the hospital were insufficient, Participant C collected data from the MHMS with the goal of having an emergency ward that is not overflowing with inpatients. The subsequent assigned tasks for Participant C were to 1) collect the number of admitted and discharged patients each day and create a graph from October to December, 2) collect data on the number of inpatients and available beds on the last day of data collection, and 3) collect data on the length of hospital stay for patients (using a select few cases).

Participant D provided several tables and graphs in the “Current situation” section of the implementation proposal and presented their findings from each table and graph, showcasing a modified fishbone diagram. The participant identified the most important factors in the fishbone diagram, such as monitoring the implementation of vaccination activities, raising awareness among the target population (especially parents) before immunization, and establishing links between the MHMS and schools. The subsequent assigned tasks for Participant D were to 1) describe the three listed factors as the real causes in the report, 2) create action plans for the three factors and include them in the implementation proposal, and 3) discuss with stakeholders actions that can be taken

within their control, incorporating them into the action plan.

Participant E explained the revised graph, the fishbone diagram, and the results of the why-why analysis. The participant considered the causes of overtime work to be sick leave and the original shortage of ward staff, highlighting staff shortages due to nurses escorting patients to the main hospital as a contributing factor to overtime. The subsequent assigned tasks for Participant E were to 1) create a graph showing the shortage of staff (similar to Participant A's graph), 2) collect three months of data on the number of days nurses were absent to escort patients, and 3) engage in discussions with other staff members about the fishbone diagram to consider factors related to overtime work.

The sixth workshop was conducted on January 23, 2023. There were three participants, with two participants absent due to work-related reasons. Other attendees included four observers from various WHO offices (Kiribati, and WPRO), five staff members from St. Luke's International University, and one interpreter.

Participant A was unable to make the presentation due to an internet connection issue but submitted the document via email at a later date.

Participant B was absent for the fifth time.

Participant C was absent for the first time.

Participant D reported on the results of the why-why analysis and explained the action plan. Mr. Furuya provided advice on how to clearly describe the new initiatives and goals in the action plan and expressed his hope that Participant D would complete the plans. The subsequent assigned tasks for Participant D were to 1) incorporate points A–E from the why-why analysis into the fishbone diagram, making the alphabetic notations stand out, and showing the link between points A–E and the elements depicted

on the fishbone diagram; 2) emphasize the new collaborations and organizations involved, under the “action” column in the action plan for all points, A–D; 3) add an additional column next to the detailed procedures timeline titled “expected outcome” and state the expected outcomes from taking these actions; and 4) write down the expected forecast of achievement alongside the corresponding sentence in Section 6 of the action plan.

Participant E provided a verbal report on sharing the fishbone diagram with colleagues. The colleagues expressed their opinion that the problem lay in many nurses receiving overtime pay for a certain number of hours and suggested the need to encourage them to change the conditions. There were other reasons for staffing shortages that were not listed in the fishbone diagram, and several ideas were presented to improve these issues through better operations and staff management. Mr. Furuya advised that the action plan should not only focus on changing conditions but also consider what can be done within Participant E’s control. Thus, the subsequent assigned tasks for Participant E were to 1) add to the fishbone diagram the factors presented orally regarding the occurrence of overtime and the variation in overtime hours among different nurses, and 2) generate ideas within Participant E’s control to reduce overtime by changing work methods or approaches.

The seventh and final workshop was conducted on March 14, 2023. There were five participants in attendance, along with one observer from the Kiribati MHMS, four observers from various WHO offices (Kiribati, Fiji, and WPRO), seven staff members from St. Luke's International University, and two interpreters. One WHO WPRO staff member and I attended this workshop in person at the MHMS conference room with other participants. For this session, participants' English statements were conveyed to

the instructor through simultaneous online interpretation, and the instructor's statements were conveyed to participants through consecutive interpretation. All five participants presented their implementation proposals and progress according to the Kaiketsu steps. Participant A chose the topic "Shortage of staff, big number of overtimes". The current situation report included issues such as delayed meals and medication for patients, staff being busy with critical cases, staff working double shifts and then coming late to work, staff working on their days off to cover the shortage, and staff missing meetings and workshops due to these issues. The goal was to provide adequate staffing and eliminate overtime in the surgical ward. The suggested actions were to follow up on a request to increase nursing emergency room staff, raise nurses' salaries, and discuss with the person in charge of the surgical ward. Future steps included checking the effectiveness of the plan by communicating with colleagues and identifying the available resources. Participant B chose the topic "Shortage of drugs in the outer islands." The current situation report was divided into categories such as transportation, stocktaking, receiving orders, incorrect amount of medicines received, disease outbreaks, and low/out-of-stock status in the pharmacy. The following goals were set: for the pharmacy to have a schedule for different ships and airplanes, to send its schedule for delivering main orders to the transport department, for outer islands to send their orders on time, for medical assistants to provide prompt feedback to the pharmacy after checking their main orders, for pharmacy packers to double-check the main orders and imprest list, to report disease outbreaks to the main hospital, and for the pharmacy to send orders to the supplier on time. The factor analysis identified poor monitoring of main orders from medical assistants, poor recording of data, and poor communication from different departments. The proposed future steps were to establish a standard that everyone could

use, to monitor and to evaluate the action plan, and improve data recording.

Participant C chose the topic “Overflow of cases in the emergency general ward. ” This topic was selected due to the long-standing issue of overcrowding in the ward, leading to stressed staff, burnout, and compromised quality of care for patients. The current issues included cases exceeding the number of beds, nurses being overloaded due to limited staffing ratios, and disorganized cases based on different diseases. The goal was to expand knowledge of the dressing technique, encourage doctors to provide discharge instructions for continued care at public health clinics, and establish a nurse aide team trained in dressing techniques to provide care at patients’ homes. Factors contributing to the issue were population growth and inappropriate distribution of family planning. In the future, the team would be well advised to ensure continuity of care, not only for surgical cases but for all cases that require home monitoring. Participant C noted having already discussed this with a surgeon, Dr. K, and developing a proposal to send to the non-communicable disease (NCD) department.

Participant D selected the topic “Low coverage of the MR2 and DPT4 immunization program on South Tarawa.” The reason for selecting this topic was the low immunization coverage over the past three years, which posed a risk to children's health and the spread of disease. From 2019 to 2021, there was a decline in coverage, with inconsistent percentages for MR2 and DPT4 vaccines. The goal was to improve the coverage for MR2 and DPT4 from the current levels of 51% and 45.3%, respectively, to 65% overall by the end of December 2022 and 85–95% by the end of 2023. The relationship between monthly summary submissions and immunization coverage was also explored, with the results indicating that higher submission rates correlated with higher vaccine coverage. Key stakeholders identified for consultation included nurses,

parents, and a pharmacy officer. The proposed actions involved establishing standard dates for school vaccination activities, conducting awareness programs for community mobilization, ongoing monitoring and progress updates, and proper micro-planning to reach target groups. Participant D reported that ongoing discussions had taken place with stakeholders and expressed the need for continued monitoring and coordination. Participant E selected the topic, “Shortage of staff leading to increased overtime over the period of a month.” The current situation involved three shifts in a day (3-2-2), which had decreased (2-2-2). Overtime ranged from 0-80 hours per staff member, with an uneven distribution. The goal was to reduce overtime hours among staff to a maximum of eight hours per month, from January to December 2023. The proposed action plans included escorting patients for advanced care by training nurse aides, adjusting the staff-to-patient ratio by reviewing and adjusting the roster, establishing a committee for a relief pool system to manage staff leave, and increasing the number of staff from 8 to 12 to address the staff shortage. In the future, Participant E planned to investigate the implementation of action plans and conduct on-site training.

After all the presentations were made, the instructor provided overall feedback, and representatives from St. Luke's International University, the WHO WPRO, the MHMS, and the WHO Kiribati shared their comments. The program concluded at the end of the final presentation. The documents submitted during the final presentation are shown in Appendix 18, with all personal information redacted.

Dealing with absences and following up on the workshops. The minutes of each workshop were disseminated to all participants, including those who were absent, ensuring comprehensive awareness of the progress and outcomes. The minutes included a concise overview of the presentations, the instructor’s guidance, assigned tasks, and

details regarding the subsequent workshop (see Appendix 19).

Additionally, tutorials were organized by St. Luke's International University and WHO WPRO personnel on November 22, December 9, and December 16, 2022, as well as on February 8, February 17, and March 1, 2023. Each tutorial accommodated 1–4 participants, allowing them to review the progression of their work and receive guidance on graph creation—an aspect that posed significant challenges for the participants. When necessary, the tutorial content was shared with the instructor, participant submissions were exchanged, and instructor feedback was promptly communicated via email to the relevant participants. In response to the participants' reports and presented materials, the instructor offered invaluable advice on establishing more specific goals, identifying supplementary data collection methods, and examples of effective graph creation. Throughout this process, I facilitated communication between the instructor and participants.

Individual comments from the instructor. After the workshop, the instructor gave each participant individual written feedback. The instructor commented on each participant's six-month problem-solving practice and final implementation proposal, focusing mainly on the choice of topic, understanding the current situation, factor analysis, goal setting, and action plans. For the choice of topic, high marks were given since all the participants had tackled important issues head-on.

Regarding the assignment to understanding the current situation, Participant A and D were highly commended for their efforts in gathering many facts and data and presenting them in graph format. Participant E was also commended for gathering appropriate data and presenting it in graphs, as well as for gaining awareness of new facts. The instructor pointed out that Participant B's assignment did not actually involve

demonstrating the current situation but, rather, determined its causes. The instructor also commented that Participant C did not provide objective data to illustrate the current situation.

Regarding goal setting, Participant D was praised for setting a milestone by November 2022 and, a goal to be achieved by the end of 2023. It was noted that Participant B and C mainly described proposed measures, not goals, while Participant A had written the means to achieve the goal, rather than explaining the goal itself. Participant E did not mention goal setting. Regarding the action plans, those of Participants A and B were evaluated as precise, with the person in charge and the departments involved clearly indicated. The instructor's feedback for Participant D noted that the plan was as accurate, as well as the need to establish indicators to evaluate its effectiveness. The instructor also highlighted that it was beneficial that Participant C narrowed down the factors and linked them to the action plan. Meanwhile, Participant E's measures were rated positively because they were specific and concrete. The instructor's comments are shown in Table 9.

Table 9

Individual comments from the instructor

	Topic	Understanding the current situation	Factor analysis (Fishbone diagram)	Goal setting	Action plans
A	It is highly commendable that the important issues were tackled head-on.	It was very good that so many facts and data were collected and presented in a graph by month. However, there was a mix of data with different units on the graph.	Not described	It was not a goal, but a written means of achieving the goal.	The person in charge and the departments involved were clearly indicated and accurate.
B	It is highly commendable that the important issues were tackled head-on.	Most of the content was related to the pursuit of causes, which should be included in the Factor Analysis section.	It would have been nice if the work procedures (processes) and departments involved could be represented as a flow diagram (mainly information flow).	It contained mainly proposed measures, not goals.	The person in charge and the departments involved were clearly indicated and accurate.
C	It is highly commendable that the important issues were tackled head-on.	It was difficult to understand because it was not expressed quantitatively.	Not described	It contained mainly proposed measures, not goals.	It was very good that the factors were narrowed down and linked to an action plan.
D	It is highly commendable that the important issues were tackled head-on.	It was very good that many facts and data were collected and the transition was shown in a graph.	The fishbone diagram identifies factors from a variety of perspectives and is easy to understand. It was very excellent.	It was highly commendable that a milestone was set by November 2022, with a target to be achieved by the end of 2023.	The action plan was precise. It would be desirable to establish indicators to measure the effectiveness of each plan.
E	It is highly commendable that the important issues were tackled head-on.	Overtime results were compiled by staff to derive impactful data.	The fishbone diagram was very well done.	No discribed	The action plan was good and concrete.

Clinical outcomes

Problem-solving motivation. Participants' problem-solving motivation was assessed using a 4-point Likert ordinal scale and free responses. In response to the question,

“Would you like to use the Kaiketsu method in your work?”, all participants answered, “Very much so (rated 1 out of 4).” In addition, the participants commented, “The problem-solving method focuses on identifying the root causes of problems and leading to solutions” and “It [the Kaiketsu method] is easy to follow in practice in the workplace.”

Setting people-centered goals. All participants selected topics related to problem-solving in their respective workplaces. The selected topics were “Shortage of staff” (Participant A), “Shortage of drugs on the outer islands” (Participant B), “Overflow of cases in the emergency general ward” (Participant C), “Low coverage of the MR2 and DPT4 immunization program” (Participant D), and “Shortage of staff leading to increased overtime over the period of a month” (Participant E).

Participant A chose the topic because of a significant impact on staff health and the services provided due to the large number of overtime work in the ward. The goals set were to provide adequate staff and eliminate overtime in the surgical ward by the end of June 2023.

Participant B chose their topic because of a vital for people's lives, and ensuring patient satisfaction is crucial. The following goals were set: for the pharmacy to have a schedule for different shipping methods, for the pharmacy to send the schedule for delivering main orders to the transport department, to ensure timely orders from outer islands, for medical assistants to provide prompt feedback after checking main orders, for pharmacy packers to rechec main orders and imprest lists, for the pharmacy to report disease outbreaks to the main hospital, and for the pharmacy to send orders to suppliers on time.

Participant C chose their topic because of the stress and burnout experienced by staff,

and the compromised quality of care for patients. The goals set were to discharge cases and continue care at home, train caretakers on dressing techniques and methods, encourage doctors to provide discharge instructions for continued care at public health clinics, and establish a nurse aide team trained in dressing techniques to provide ongoing care to home patients.

Participant D chose their topic because the local immunization coverage had been very low, leaving many children vulnerable to preventable diseases. The goals set were to improve the coverage for MR2 and DPT4 from the current levels of 51% in MR2 and 45.3% in DPT4 to 65% overall by the end of December 2022, and to then reach 85 to 95% coverage by the end of 2023.

Participant E chose their topic because of an interest in understanding the factors contributing to the shortage of nursing services in the area. The goal set was to reduce the number of overtime hours among staff to a maximum of 8 hours per month from January to December 2023. The selected topics, the reasons for their selection, and the goals set by the participants are summarized in Table 10.

Rate of planning problem-solving measures. Each of the five participants set one problem to address and all participants set action plans for their respective problems. Hence, the rate of planning problem-solving measures was 100%.

Table 10

Topics selected, reasons for selection, and goals set

	Topic	Reasons for selection the topic	Goal
A	Shortage of staff	Due to staff shortages, there is a large volume of overtime work in this ward. Therefore, it has a significant impact on the staff's health and the service they provide that need to be carried out.	• To provide adequate staff to surgical ward by the end June 2023 • To eliminate overtime to surgical ward by the end June 2023
B	Shortage of drugs on the outer islands	• Medicine protects people's lives • People receiving the care will be satisfied	• Pharmacy to have a schedule of different ship and airplane. • To send their schedule in delivering of main orders to transport Department • Outer Island to send their orders on time • Medical Assistant to send their feedback to Pharmacy as soon as possible after checking their main orders • Pharmacy packers to recheck the main orders as well as imprest list • To report the outbreak of disease to main hospital • Pharmacy to send their orders to the supplier on time
C	Overflow of cases in the emergency general ward	Overstress of staff, burnout, and more concerningly the missing quality of care for all patients continues.	• Discharging the cases and continuing the care at home • Training the caretakers on dressing technique and methods • To encourage the Drs to write the passage form upon the patient discharge to continue the care at the public health clinics • Liaise with NCD department to establish a team like nurse aide, train this team on the dressing techniques and to carry out to home patients as continue of care.
D	Low coverage of the MR2 and DPT4 immunization program	Immunization coverage has been very low which means many of the children in this age group are not fully protected from these preventable diseases if they happen to come to the country in the future.	To improve the coverage for MR2 and DPT4 from the current status of 51% in MR2 and 45.3% in DPT4 to 65% by the end of December 2022 and reaching 85 to 95% at the end of 2023.
E	Shortage of staff leading to increased overtime over the period of a month	I am interested to know what really causes the shortage in nursing services in this area.	To reduce the number of overtime among the staff to 8 hours at least for Jan to Dec 2023

Achievement rate for self-defined goals. All participants set goals and milestones during the program implementation period; however, none of the goals were achievable within the given timeframe. All participants reported achieving one or more milestones during the program.

Participant A set the goal of providing adequate staff to the surgical ward by the end of June 2023 and eliminating overtime in the surgical ward by the same date. The milestones set were meeting with colleagues during the rotation of staff by the end of 2022 and having a short meeting with the surgical supervisor by the end of April 2023. Participant A reported that the milestone of having a meeting with colleagues during staff rotation had already been accomplished.

Participant B set goals for the pharmacy to have a schedule for different shipping methods, to send the schedule for delivering main orders to the transport department, and to ensure timely orders from the outer islands; for medical assistants to provide prompt feedback after checking main orders; for pharmacy packers to recheck main orders and the imprest lists; and for the pharmacy to report disease outbreaks to the main hospital and ensure timely orders from suppliers. Although the milestones were not explicitly mentioned in the report, the participant orally reported that the initial milestone of having a discussion with the pharmacy had already been achieved.

Participant C set the goal of discharging cases and continuing care at home, training caretakers on dressing techniques and methods, encouraging doctors to provide discharge instructions for continued care at public health clinics, and liaising with the NCD department to establish a nurse aide team trained in dressing techniques that could provide ongoing care to patients at home. Participant C reported agreeing to send the proposal to the NCD department by the end of the month.

Participant D set the goal of improving the coverage for MR2 and DPT4 vaccinations from the current status of 51% and 45.3%, respectively, to 65% overall by the end of December 2022 and 85–95% by the end of 2023. The milestones set were reaching a vaccination coverage range of 60% for MR2 and DPT4 by November 2022 and a range of 65–70% by December 2022. It is unclear whether these milestones were achieved. However, Participant D reported that the milestone of establishing a standardized time for routine immunization in the school vaccination program had already been accomplished.

Participant E set the goal of reducing the number of overtime hours among staff to a maximum of eight hours per month from January to December 2023. They reported that a meeting had been held regarding the need to adjust the staff's weekly schedule, which was one of the milestones.

The goals and milestones set by each participant are summarized in Table 11.

Table 11

Goals and milestones set

	Goal	Milestones
A	• To provide adequate staff to surgical ward by the end June 2023 • To eliminate overtime to surgical ward by the end June 2023	Meet together with my colleague during the rotation of staff: At the end of the year 2023 Depend on the government decision: 2024 A small meeting with the Surgical charge: The end of April 2023
B	• Pharmacy to have a schedule of different ship and airplane. • To send their schedule in delivering of main orders to transport Department • Outer Island to send their orders on time • Medical Assistant to send their feedback to Pharmacy as soon as possible after checking their main orders • Pharmacy packers to recheck the main orders as well as imprest list • To report the outbreak of disease to main hospital • Pharmacy to send their orders to the supplier on time	First milestone: Discuss with the pharmacy
C	• Discharging the cases and continuing the care at home • Training the caretakers on dressing technique and methods • To encourage the Drs to write the passage form upon the patient discharge to continue the care at the public health clinics • Liaise with NCD department to establish a team like nurse aide, train this team on the dressing techniques and to carry out to home patients as continue of care	First milestone: Agreement to send a proposal to NCD
D	To improve the coverage for MR2 and DPT4 from the current status of 51% in MR2 and 45.3% in DPT4 to 65% by the end of December 2022 and reaching 85 to 95% at the end of 2023	By November 2022, the vaccination coverage for MR2 and DPT4 is targeted to reach 60%. By December 2022, the vaccination coverage for MR2 and DPT4 is a range of 65-70%
E	To reduce the number of overtime among the staff to 8 hours at least for Jan to Dec 2023	Conduct a meeting as necessity of adjusting the staff's regular roster

Implementation outcomes

Adoption. Adoption was evaluated based on participants' utilization of problem-solving tools and their implementation of self-defined problem-solving approaches. To understand the current state of their chosen topics and analyze the causes of the identified problems, participants employed a variety of problem-solving tools. Four participants utilized a fishbone diagram for factor analysis. Three participants used bar charts, two used line charts, and one used stacked graphs to analyze the current status of the problem. Additionally, one participant used a process flow diagram, and another used a list of operational implementation status, both for the purpose of understanding

the current status. The results of the participants' use of problem-solving tools are summarized in Table 12. Subsequently, all participants developed action plans aimed at resolving the identified issues. During the final presentation, it was reported that all participants were actively engaged in implementing their respective action plans.

Table 12

Results of the use of problem-solving tools

Problem-solving tools	Number of users	Purpose of use
Fishbone diagram	4	Factor analysis
Bar graph	3	Understanding current situation
Line graph	2	Understanding current situation
Stacked graph	1	Understanding current situation
Process flow diagram	1	Understanding current situation
List of operational implementation status	1	Understanding current situation

Appropriateness. The appropriateness of the program content and methods was assessed using a 4-point Likert ordinal scale and free responses. The questions and answers are summarized in Table 13.

The results of the questionnaire indicate that the time required for the workshop was appropriate for the participants. The reason for the one "Not very much" response was that the participant could not attend due to other work commitments. Participants also commented that the materials were easy to read and understand. The difficulty level was also appropriate for the participants, who indicated that the sessions with the lecturers,

in particular, deepened their understanding. To the question “Do you think that the contents of the workshops are relevant to your work?”, all participants answered, “Very relevant” (rated 1 out of 4).

Table 13

Questions and answers on the appropriateness of the program content and methods

Question	Answer			
	Very much so.	Yes, I do.	Not very much.	I don't think so at all.
Do you think the time required for the workshop is appropriate?	3	1	1	0
	Very easy to read	Easy to read	Difficult to read	Very difficult to read
Were the materials easy to read?	3	2	0	0
	Very much so.	Yes, I do.	Not very much.	I don't think so at all.
Do you think the difficulty level was suitable for you?	3	2	0	0
	Very relevant	Relevant	Not very relevant	Not at all relevant
Do you think that the contents of the workshops are relevant to your work?	5	0	0	0

Acceptability. To assess the project’s alignment with participants’ needs and their satisfaction with it, participants’ self-evaluations were measured on a 4-point Likert scale. When asked about their overall level of satisfaction with the project, two participants responded with “Very satisfied” (rated 1 out of 4), two with "Satisfied”(rated 2 out of 4), and one with “Somewhat dissatisfied(rated 3 out of 4)." The participant who expressed being somewhat dissatisfied mentioned that their dissatisfaction stemmed from the reliance on Zoom and e-learning, and they believed they would have been more satisfied if they had participated in person. However, the

participant also noted that the project was satisfying overall. The participants who answered “Very satisfied” also added that on-site training would be preferable, if possible. In response to the question, “Would you recommend the project to others? ”, three participants’ responded with “Very much so” (rated 1 out of 4), and two with “Yes” (rated 2 out of 4) . When asked who they would recommend the project to, responses included “Senior Nursing Officers” and “Medical Assistant Nurses in the outer islands.”

Penetration. Attendance at each of the workshops and tutorials is shown in Table 14 and 15. Although there were some absences, all participants were able to complete the program. The workshop instructor, the WHO WPRO staff, and I followed up on the absences by responding to emails and conducting tutorials, as necessary.

Table 14

Attendance at each of the workshops

	1st Workshop 16-Aug-22	2nd Workshop 9-Sep-22	3rd Workshop 19-Oct-22	4th Workshop 15-Nov-22	5th Workshop 20-Dec-22	6th Workshop 23-Jan-23	7th Workshop 14-Mar-23
A	✓	✓	✓	✓	✓	✓	✓
B	✓						✓
C	✓	✓	✓	✓	✓		✓
D	✓	✓	✓	✓	✓	✓	✓
E	✓	✓	✓	✓	✓	✓	✓

Table 15

Attendance at each of the tutorials

	Tutorial 9-Dec-22	Tutorial 16-Dec-22	Tutorial 8-Feb-23	Tutorial 17-Feb-23	Tutorial 1-Mar-23
A	✓	✓			✓
B			✓	✓	✓
C		✓			✓
D	✓	✓			✓
E	✓	✓	✓		

Process evaluation and supplemental evaluation of implementation outcomes. The Kiribati MHMS officials expressed their gratitude for the program and indicated their intention to incorporate training on problem-solving techniques into their management education program in Kiribati. WHO officials also acknowledged the program's effectiveness in enabling participants to analyze current problems, set goals, and identify pathways for improvement. The shift in approach allowed participants to initiate a different way of working operationally.

However, the WHO officials raised several concerns. First, they highlighted the communication difficulties encountered during the online workshop sessions. Due to the unstable internet connection in Kiribati, there were instances of temporary disconnection, hindering smooth communication. Moreover, relying on interpreters for communication between the instructor and participants added another layer of complexity, making it challenging to provide clear instructions and guidance compared to in-person workshops. The online interpretation process, coupled with the unstable internet access, posed difficulties for the interpreters. Second, there was concern regarding maintaining participant motivation throughout the program. Participants were given assignments at each workshop to practice problem-solving techniques based on their chosen topics; however, it appeared that they struggled to adequately complete

these assignments. This may be attributed to participants having high work priorities, limiting their ability to dedicate sufficient effort to practicing problem-solving. Third, it was noted that while participants grasped the concepts theoretically, translating them into practice proved challenging. Specifically, the use of data presented difficulties. Given that many medical records in Kiribati are handwritten, extracting and organizing the necessary information from these extensive records was a daunting task. Despite the detailed guidance provided during the workshop on visualizing the current situation using data, participants seemed to encounter difficulties in independently executing this aspect.

A Model Case of the Problem-Solving Practice Process. Among the program participants, Participant D was used as a model case to describe the process.

In the first workshop, each participant presented a specific issue related to their work. Participant D highlighted the low immunization coverage among the local target population, particularly children under one year. Thus, the assigned task for Participant D was to indicate the monthly diphtheria, pertussis, and DPT and MR vaccination rates for one year.

Participant D submitted her assignment in a PowerPoint document one week before the second workshop. In his handout, Participant D described the 15 health clinics in her area of jurisdiction, the number of healthcare professionals working there, and their qualifications. She also summarized in a table the population of the area served by each health clinic, the number of DPT and MR subjects in her area of jurisdiction, and the number and rate of annual immunizations administered over the past three years. She presented her report based on that document at the second workshop. Through individual sessions with Mr. Furuya, it became clear that there were fairly large

differences in vaccination coverage among the clinics. The subsequent assignments for Participant D were to 1) obtain vaccination coverage data from other areas; 2) make a comparison between South Tarawa and other areas; 3) note any health differences between each area and South Tarawa; 4) discuss potential factors influencing the coverage rate differences with stakeholders; 5) engage in discussions with colleagues and multiple stakeholders to identify possible causes or reasons for the coverage rate differences; and 6) set a goal for improved vaccination coverage.

Two days before the third workshop, Participant D submitted her assignment in a Word document, which compared vaccination rates between South Tawara and the other four islands in a graph. She received a suggestion to separate the graphs in order to highlight that the coverage rate was lowest in the city area, which is South Tarawa. Participant D also noted any health differences in South Tarawa and another area (Tamana) in a table. She interviewed health clinic nurses, mothers of children targeted for vaccination, elementary school staff, and pharmacy staff to explore the factors contributing to low vaccination coverage. The subsequent assignments for Participant D were to 1) make one bar graph per island for each year (5 separate graphs for each of island to identify their individual characteristics), 2) determine the prevalence of the relevant diseases that could be prevented by the vaccines; and 3) create a fishbone diagram entitled “Low Coverage Rate,” isolate keywords associated with the characteristics of each island, and apply them to the diagram. Participant D was also tasked with using the fishbone diagram to build up a story and emphasizing important words on the diagram to create specific action plans.

The mid-term summary was presented at the fourth workshop. Participant D submitted this summary two days before the workshop. Participant D presented on the topic, “Low

coverage of the MR2 and DPT4 immunization program on South Tarawa," based on her implementation proposal. The subsequent assigned tasks for Participant D were to 1) select one available vaccine for comparison based on vaccination rate, 2) remove assessments from the "Understanding the current situation" section and focus on listing facts, and 3) include the fact that the report submission rate may affect the vaccination rate in the fishbone diagram.

Participant D submitted a revised mid-term summary document on the day of the fifth workshop. She included several tables and graphs in the "Current situation" section of her implementation proposal and presented her findings from each table and graph, showcasing a modified fishbone diagram. She identified the most important factors in the fishbone diagram, including monitoring the implementation of vaccination activities, raising awareness among the target population (especially parents) before immunization, and establishing links between the MHMS and schools. The subsequent assigned tasks for Participant D were to 1) describe the three identified factors as the real causes in the report, 2) create action plans for thees three factors and include them in the implementation proposal, and 3) discuss with stakeholders actions that could be taken within their control, incorporating them into the action plan.

Participant D submitted a revised mid-term summary document on the day of the sixth workshop. She reported on the results of the why-why analysis and explained the action plan. The instructor, Mr. Furuya gave advice on how to clearly describe the new initiatives and goals in the action plan and expressed his hope that Participant D would complete the plans. The subsequent assigned tasks for Participant D were to 1) incorporate points A–E from the why-why analysis into the fishbone diagram, highlighting the alphabetic notations, and showing the link between points A– E and the

elements depicted on the diagram; 2) emphasize the new collaborations and organizations involved, under the “action” column in the action plan for all points, A–D; 3) add an additional column next to the detailed procedures timeline titled “expected outcome” and state the expected outcomes from taking these actions; and 4) write the expected forecast of achievement alongside the corresponding sentence in Section 6 of the action plan. The final report was presented at the seventh workshop. The following summarizes Participant D’s presentation.

Participant D selected the topic “Low coverage of the MR2 and DPT4 immunization program on South Tarawa. ” The reason for selecting this topic was the low immunization coverage over the past three years, which posed a risk to children's health and the spread of disease. From 2019 to 2021, there was a decline in coverage, with inconsistent percentages for MR2 and DPT4 vaccines. The goal was to improve the coverage for MR2 and DPT4 vaccination from the current levels of 51% and 45.3%, respectively, to 65% overall by the end of December 2022 and 85–95% by the end of 2023. The relationship between monthly summary submissions and immunization coverage was also explored, with the results indicating that higher submission rates correlated with higher vaccine coverage. Key stakeholders identified for consultation included nurses, parents, and a pharmacy officer. The proposed actions involved establishing standardized dates for school vaccination activities, conducting awareness programs for community mobilization, ongoing monitoring and progress updates, and proper micro-planning to reach target groups. Participant D reported that ongoing discussions had taken place with stakeholders and expressed the need for continued monitoring and coordination.

CHAPTER VI: DISCUSSION

Summary of findings

The purpose of this study was to develop and assess the feasibility of a goal-driven actor program for healthcare workers involved in primary healthcare. A preliminary study was conducted to inform the design, and development of a two-part e-learning program. E-learning Part 1 served as pre-learning material before the workshops, while E-learning Part 2 was used alongside Sessions 1 through 4 of the workshops to support participants in problem-solving. A total of seven workshops were organized and implemented, with the researcher facilitating the online workshops from Japan and the final workshop taking place on-site in Kiribati.

Primary healthcare workers in Kiribati face the challenge of being the sole healthcare providers in their communities, particularly on remote islands. They encounter difficulties in managing daily primary healthcare tasks while fulfilling their roles as primary healthcare professionals. Developing problem-solving skills to independently address work-related challenges is essential for them. To address this need, a culturally appropriate and tailored Kaiketsu program for primary healthcare workers in Kiribati was developed, combining e-learning and workshops to provide fundamental problem-solving knowledge. The program content was based on a practical problem-solving video program implemented in Japan. The diverse educational backgrounds of the target nurses, the geographical characteristics of the Pacific Island country, and the level of medical care available on remote islands were taken into account. The training program was conducted with five Kiribati nurses, incorporating both e-learning and workshop components. All participants who completed the pre-workshop e-learning course exhibited high motivation to participate in the subsequent workshops. Throughout the

program, the participants followed problem-solving steps to address issues in their respective workplaces and shared their findings in a final presentation. A post-program survey revealed that participants expressed a desire to continue using problem-solving approaches in their work. Four participants highly rated the program's content and methodology, and participants expressed high satisfaction with the program overall. All participants indicated their willingness to recommend the program to others, including senior nursing officers and medical assistant nurses in the outer islands. Kiribati MHMS officials praised the program and expressed interest in incorporating problem-solving training into management education programs in Kiribati. They also requested that the WHO extend the training to medical assistant nurses. Based on the outcomes of this study, I discuss the program's achievements and its potential for future development in the following section.

Clinical outcomes

Increased problem-solving knowledge. Four out of the five participants completed a pre- and post-course knowledge test. In the post-test, all participants either maintained or improved their scores compared to the pre-test. However, a t-test conducted to examine the differences between conditions did not reveal any significant findings ($p = 0.215$). It should be noted that the small sample size may have contributed to the inability to detect significant differences. The knowledge test consisted of 10 questions, specific to this program, scored on a 4-point Likert scale. The reliability and validity of this test were not confirmed. The limited number of questions and the small sample size might have hindered the identification of significant differences. Furthermore, Part 1 of the e-learning program (pre-learning) only provided an introduction to problem-solving.

To measure this outcome effectively in the future, a careful evaluation of the content of the test questions' content is necessary. Consideration should also be given to more reliable tests with a larger number of questions that align with the program's content. Additionally, calculating the required sample size and implementing it in the evaluation process would enhance the testing effectiveness of the program.

Increased motivation to solve problems. In the post-program questionnaire, all participants expressed their interest in continuing to use the problem-solving methods they learned during the program. Since participants' motivation for problem-solving was not assessed before the program, it is difficult to determine if this motivation increased as a result of participating. However, the comments provided in the free-response sections of the questionnaire indicate that the participants found the problem-solving methods valuable and felt that they contributed to their motivation to adopt better working practices.

Setting people-centered goals. All participants in the program selected a problem-solving topic and set goals for their workplaces. Four participants explicitly mentioned that their topic selection was motivated by the desire to improve and enhance the delivery of services to patients. This aligns with the concept of the "Goal-driven Actor" initiative, where individuals collaborate with healthcare professionals to address health issues in individuals and communities (Nitamizu et al., 2022). However, many of the problems that the participants addressed could not be solved simply by changing their own work systems and practices. The fact that the participants' supervisors were aware of the initiatives they were undertaking suggests that they were important issues within the scope of their work. On the other hand, it is possible that there were other important community- or patient-oriented topics that were not selected.

It is important to keep in mind that the ultimate goal is to improve and enhance the target population's health issues. Setting specific, measurable, and time-bound goals is crucial to effective goal setting (Furuya, 2018); however, only two of the five participants were able to set goals in this format. It is equally important to establish milestones to monitor the progress and degree of goal achievement along the way (Furuya, 2018). Due to the need to spend significant time understanding the current situation, setting specific indicator-based milestones was challenging given the program's limited duration. However, participants were able to identify milestones for the necessary steps to be implemented, envisioning a pathway toward achieving their goals. While setting more specific goals and milestones could have been improved, participants demonstrated their commitment to the problem-solving process and took steps toward achieving their desired outcomes.

Rate of planning problem-solving measures. All five participants successfully developed final problem-solving measures and presented them at the last workshop, resulting in a 100% rate of planning problem-solving measures. As noted in the workshop content section, participants dedicated a significant amount of time to understanding the current situation and creating graphs to visualize the collected data. The difficulties participants experienced when creating the graphs, which resulted in them spending more time on this step than expected, were due to a lack of assessment of their readiness. Consequently, this step took time before participants could progress to planning countermeasures; however, once they reached the factor analysis stage, participants were able to listen to the perspectives of those involved, create a fishbone diagram, and identify the underlying factors. Looking back on this process, it may not have been necessary to spend a lot of time obsessing over graphing. The reason for this

is that although graphing is an important tool for promoting a common, objective understanding of the current situation among those involved in working together, if a common understanding can be achieved without a graph, then the original purpose can be fulfilled.

A fishbone diagram is a useful tool for categorizing the relationship between an outcome and its factors into four main categories and helps identify the root causes contributing to a problem (Furuya, 2018). To construct a fishbone diagram, it is necessary to have a common understanding of the current situation among all stakeholders, gather input from them, consider their perspectives, and determine causal relationships among the identified factors. These factors are then organized and represented in a categorized format. Through this process, the participants successfully identified the factors contributing to the problems in their workplaces and developed action plans for each factor. This demonstrates their ability to analyze complex situations, consider multiple perspectives, and develop comprehensive strategies to address the identified issues.

Looking back on the program, it may not have been necessary to spend a lot of time focusing heavily on creating graphs. Although graphing is an important tool for promoting a common, objective understanding of the current situation among individuals working together, it is not considered an essential element if a common understanding can be achieved without a graph. As an example, one mechanism that enables teaming is cross-boundary exchanges. Cross-boundary teaming involves working across boundaries, with diverse groups of people representing different organizations, over a limited period of time (De Jong et al., 2021). As team members work across boundaries, they exchange knowledge and ideas, which can lead to

innovation (Edmondson& Harvey, 2017). A more detailed analysis of the process by which participants in this study's program came to a common understanding, identified factors, and developed countermeasures is an issue for future research.

The achievement rate of self-defined goals. None of the goals set by the participants were intended to be fully achieved within the limited duration of the program. In a typical training program, it is recommended to set milestones to assess progress at the end of training. However, due to the extensive time required to understand the situation, there was a delay in setting specific goals. Nevertheless, participants were able to set milestones for the necessary steps to be implemented and successfully initiated the first step toward achieving their goals. Though the goals themselves were not fully accomplished within the program's timeframe, participants demonstrated their ability to envision the pathway toward achieving their objectives by setting these milestones. This indicates a proactive approach and making progress toward their goals.

Implementation outcomes

Adoption. The adoption of problem-solving tools and the implementation of self-defined problem-solving activities were evaluated based on the actual use of these tools and the implementation status. The problem-solving tools primarily served the purpose of understanding the current situation and analyzing the root causes of the identified problems. Bar graphs and line graphs were commonly used in the problem-solving process, as they are effective for comparing quantities and understanding changes over time. However, it should be noted that creating these graphs was time-consuming, and some of the submitted graphs exhibited discrepancies, such as elements that were improperly compiled or data appearing on the same graph that should have been

presented separately. Adherence to formal graph creation rules was not strictly enforced; graphs were acceptable as long as their format did not significantly hinder the presentation of the actual situation. The main objective was to practice the problem-solving procedures, and participants focused on achieving that goal. During the factor analysis stage, all participants utilized the fishbone diagram. Engaging in discussions with relevant individuals while creating the fishbone diagram provided valuable insights into factors that had not been previously identified. The process of creating a fishbone diagram entails listening to various perspectives and considering cause-and-effect relationships among the identified factors. It also requires organizing the enumerated factors into appropriate categories. Participants successfully utilized the fishbone diagram as a tool for analyzing and understanding the complex relationships within the respective problems they identified.

Appropriateness. The appropriateness of the program content and methods was evaluated through self-administered questionnaires, which used a 4-point Likert scale and free-responses. Overall, participants provided positive evaluations of the program; however, it should be noted that one participant missed several workshops due to an extended business trip to a remote island. Although the workshops were designed to be conducted online to accommodate participants working on remote islands, the internet connectivity in Kiribati posed challenges for remote participation. It was found that participants faced difficulties in accessing the online workshops from remote islands due to the unstable internet environment. Thus, it is recommended that participants attend the workshops at the MHMS facility, where the internet connection is relatively reliable, even when online workshops are conducted. Moreover, participants expressed positive evaluations of the sessions with the instructor, the difficulty level of the

program content, and the clarity of the materials provided. These aspects of the program were well-received by the participants, indicating their satisfaction with the content and methods employed in the training.

Acceptability. Acceptability was assessed by measuring participants' self-assessment of their agreement and satisfaction with the program on a 4-point Likert scale. Overall, participants expressed high levels of satisfaction with the program; however, some participants mentioned that they preferred face-to-face training over online training. Despite this, all participants indicated that they would recommend the training to others, with particular emphasis on targeting Senior Nursing Officers and Medical Assistant Nurses in outer islands. The Senior Nursing Officer is responsible for overseeing a hospital and is a higher-ranking position than the participants, while the Medical Assistant Nurse holds a similar position and is responsible for a public health center. Kiribati MHMS officials also expressed their interest in adapting the training for Medical Assistant Nurses, recognizing the need for nurses to possess strong problem-solving skills, especially those working in remote island settings.

Penetration. Penetration was evaluated by assessing the program completion rate. As abovementioned, one participant missed several workshops due to their extended business trip to an outer island; however, they were able to engage in problem-solving activities by following the provided tutorials and receiving follow-ups via email from St. Luke's International University and the WHO WPRO, who organized the operation of the workshops. Overall, the primary reason for multiple absences was the participants' work commitments on a remote island. It is important to note that in countries with limited internet access, such as Kiribati, coordinating participants'

attendance during online workshops is necessary to ensure their participation in the training program.

A model case of implementing problem-solving. Participant D's approach was used as the model case. Participant D is the head of a nursing department that covers a region with 15 health clinics. She chose the low coverage of the MR2 and DPT4 immunization program as her topic and implemented problem-solving according to the training program. She attended all the workshops, worked on the assignments that were set in the workshops, and submitted all of them. The deadline for submitting assignments was two days before each workshop. Participant D submitted her assignments for the second through the fourth workshops by the deadlines. For the fifth through the seventh workshops, she submitted her assignments on the day. She attended the tutorials three times, mainly to check her progression and prioritize her assignments, and made steady progress. This attitude suggests that she maintained a high level of motivation. Participant D also stated that the feedback from the instructor during the workshops was effective.

Participant D selected the low MR and DPT immunization coverage in her area of jurisdiction as a topic. These immunizations are given to 6-year-olds in mass vaccination programs at elementary schools in the health center’s jurisdiction. To explore this topic, Participant D collected data on immunization coverage for each health center jurisdiction, organized it into a table, and presented it graphically. In doing so, she discovered that several health centers had not submitted any data. Although it took some time to create a graph to objectively show the current situation, it was believed that the non-submission of data was causing the overall vaccination rate to appear lower than it actually was; consequently, an action plan was created that

included having each health center submit the required data. In the factor analysis step, Participant D also asked school officials and parents of children why they did not have their children immunized, indicating collaboration with numerous stakeholders, including community members.

It is believed that the participants were able to follow the paths that were laid out for them in the training, allowing them to tackle the topics they originally identified as problems. In his comments to Participant D after the workshop, the instructor noted that she had chosen an important problem as her topic, that she had gathered a lot of facts and data and worked on graphing them, that her fishbone diagram identified factors from various perspectives, and that in setting goals, she had indicated a target to be achieved by the end of 2023. Participant D's action plan was highly evaluated for its precise content, though no indicators were set to measure its effectiveness. Although community members did not seem to know about the problem of low immunization coverage, it is expected that this initiative and the continued implementation of the action plan will serve to raise their awareness.

Assessment of Reproducibility

To evaluate the reproducibility of the program, the impact of the instructor and the program administrator was examined. The program was led by an instructor who is a specialist in problem-solving. It was administered by myself, a doctoral student in global health nursing at St. Luke's International University, and a WHO WPRO staff member. A professor of global health nursing at St. Luke's University oversaw the entire project. I prepared and moderated the workshops, and the professor of global health nursing, a researcher from the laboratory at St. Luke's International University,

and three graduate students participated as administrative assistants. The professor, researcher, one WHO WPRO staff member, and I followed up on issues that could not be resolved during the workshop and with participants who were absent.

The program was designed for participants to implement problem-solving in their own workplaces based on the advice given in the sessions with the instructor. The workshops were conducted according to defined problem-solving steps and the assignments presented in the workshop were necessary to be able to follow these steps. Thus, it was considered that the instructor, who had knowledge and experience in problem-solving, was able to give appropriate feedback on the participants' deliverables and the content of their presentations. However, in the future, when different individual serves as the program instructor, there may be differences due to their level of competence.

Those of us involved in following-up on issues that could not be resolved in the workshop and with absentees were qualified nurses and public health nurses or midwives. Problem-solving specialists and healthcare professionals were also involved in the program. We served as a bridge between the instructor, a problem-solving expert, and the nurses, who were engaged in the implementation of problem-solving, while understanding the expertise of both parties. This role was important in promoting a common understanding between the instructor and the participant nurses and in facilitating the program. Future implementation of this program should include at least one nurse in a similar role as a facilitating health care professional.

Agreement and disagreement with other studies

Quality management approaches are widely utilized in healthcare within the context of Japan's international cooperation efforts (Ishijima et al., 2019; Hasegawa and

Karandagoda, 2013; Hasegawa, 2006). While these approaches are not specifically tailored to nursing practice, there have been nurse-focused initiatives that have incorporated quality management principles. One such example is the implementation of a participatory group problem-solving approach among supervisors and staff nurses in a public health nursing department in Oklahoma in the United States (Schmele et al., 1991). This initiative aimed to equip nurses with the skills to utilize the Quality Circle (QC) process and support them in developing and implementing QC programs. The outcomes of this initiative demonstrated effective problem-solving, improvements in the quality of care and documentation, enhanced service delivery efficiency, and increased employee motivation. As a quality management activity, QC is closely associated with problem-solving methods. In a Taiwanese hospital, Lee (2000) found that a 3-month QC course and a 3-month QC process training program significantly enhanced nurses' job satisfaction, reduced absenteeism, and decreased turnover. Recognizing that quality management approaches encompass a broader framework that includes various problem-solving techniques and emphasizes organizational management is important. Meanwhile, practical problem-solving training, as described in this study, specifically focuses on developing problem-solving skills.

Implications for nursing practice

The findings suggest that the practical problem-solving training program developed in this study has the potential to enhance problem-solving skills among Kiribati nurses. However, problem-solving skills cannot be acquired solely through knowledge acquisition: Gradual practice is also needed. The development of a sense of self-efficacy is crucial for effective problem-solving. This practical problem-solving training program was specifically designed to enhance participants' self-efficacy in problem-

solving, and the postprogram questionnaires indicate that this objective was achieved. Further, since the five participants attended the workshop together and were able to listen to the instruction others received, they could apply the advice the instructor gave to other participants in their own efforts. It is also possible that continuing the workshop over a six-month period helped to maintain participants' motivation.

The WHO Global Strategic Directions for Nursing and Midwifery (2021‑2025) is a significant document that emphasizes the need to strengthen nursing leadership and empower nurses to actively participate in healthcare policy formulation and the decision-making process. It recognizes the importance of enabling nurses to contribute to improving the effectiveness of health and social care systems. Investments in leadership development are crucial for strengthening the nursing workforce, achieving the United Nations' Sustainable Development Goals, improving overall population health, and attaining Universal Health Coverage (WHO, 2021). Nursing leadership plays a vital role in enhancing nursing human resources, and it is anticipated that nursing managers' participation in practical problem-solving training will contribute to strengthening nursing leadership.

The first aspect of the program that should be considered for improvement in the future is providing support for appropriate topic selection. While maintaining the basic policy of working with topics selected by the participants themselves, it is necessary to select topics that are more in line with the essential needs of community members or patients. Second, it is necessary to consider what should be done if graphing is difficult. In addition to graphing, how objective information on the current situation can be shared among the parties concerned and how factor analysis can be conducted are further considerations. Finally, it is necessary to deal with cases in which nurses from outlying

islands participate in the program. It is currently difficult for theses nurses to participate due to the unstable internet environment. Moreover, it takes several days to travel one way from some places to the main island, so it is not practical to complete this journey every month. Thus, it is essential to assess how the program's content can be maintained while simultaneously taking into account the feasible frequency and duration of travel to the main island.

Limitations and future studies

Although this study's training program was developed for professionals involved in primary healthcare, the participants were nursing managers at the upper levels of the Kiribati MHMS. Therefore, the topics selected were mostly related to nursing management, for example, staff vacancies, and were often far removed from primary healthcare, which is aimed at the community.

Within the context of PCC, opportunities to form partnerships with community members were sparse. However, participants who focused on child immunization rates engaged with school personnel and parents during the factor analysis phase, seeking their viewpoints and investigating the contributing factors. As the action plan progresses, long-term monitoring is essential to determine the potential for establishing collaborations between healthcare workers and community members, ultimately realizing PCC. In the future, as the program expands to include nurses from different levels, new issues and challenges may also arise.

Another limitation of this study was the online format of the workshops. While this allowed nurses from remote islands to participate, the unstable internet connection in Kiribati posed challenges, resulting in frequent disruptions. This limitation must be addressed in future implementations to ensure a smoother workshop experience for all

participants.

Nonetheless, the program successfully developed problem-solving plans, implemented them to the point of initiation, and evaluated their effectiveness. A long-term follow-up is necessary to assess the sustained impact of the program on participants' problem-solving skills and its influence on clinical outcomes.

Furthermore, the presence of an interpreter during the workshops increased the duration of communication, causing sessions to take longer than if direct communication was possible. To expand and sustain the program in the future, developing local instructors who can effectively lead the workshops without the need for interpretation is essential. Future research should explore the feasibility of expanding the program to a larger audience, including the primary healthcare workforce in Kiribati and, potentially, neighboring countries. It is also important to evaluate the program's impact on a broader scale to assess its effectiveness in different contexts and settings.

CHAPTER VII: CONCLUSION

In this study, a practical problem-solving training program that combined e-learning and seven workshops was developed and implemented for primary healthcare providers in Kiribati. The feasibility of the program was evaluated, and it was found that all participants were able to develop a countermeasure plan for their chosen issue area and initiate the implementation of the plan.

The findings suggest that the program is applicable to primary healthcare providers in Kiribati and has the potential to improve their problem-solving skills. Further research is needed to assess the long-term effectiveness of the program.

Moreover, it is crucial to focus on expanding the program to include nurses, given the significant role they play in primary healthcare in Kiribati. By including nurses in the program, the impact on overall healthcare services and outcomes could be maximized. However, this would require adapting the program to meet the specific needs and responsibilities of nurses in the primary healthcare context.

謝辞

本研究を進めるにあたり、終始丁寧なご指導と激励を賜りました指導教員の大田えりか先生に深く感謝申し上げます。

主査の小山田恭子先生には、計画書審査の段階からこの研究を向上させるため、多くの貴重なご助言を頂きました。副査の小川正子先生は、JICA 派遣専門家としての長年にわたるご経験から、プライマリーヘルスケアの向上に寄与する重要な示唆を与えてくださり、また、同じく副査の射場典子先生からは、People Centered Care の実践と研究に基づいた貴重なアドバイスを賜りました。また埼玉県立大学教授の髙橋恵子先生には、計画書審査において副査を務めて頂き、People Centered Care を中心概念に据えた本研究に対して多くの示唆とアドバイスを頂きました。審査を通じて多くの気づきを与えて頂いたことで、修正を重ね、博士論文の作成に至りましたこと、深く御礼申し上げます。

本研究は、聖路加国際大学が世界保健機関西太平洋地域事務局（World Health Organization Regional Office for the Western Pacific: WHO WPRO）の委託を受けて開発・実施したプロジェクトの一環としておこなわれました。プログラムの開発・実施にあたり WHO WPRO のナーシングオフィサーである芝田おぐさ氏と協働させて頂いたことは、非常に貴重な経験となりました。また本プログラムの講師としてご尽力頂いた、問題解決手法の専門家であり、医療従事者向けの実践的な問題解決研修をおこなってこられた株式会社クオリティ・クリエイションの古谷健夫先生との出会いも非常に大きなものでした。キリバスで実施するプログラムの開発に際し、国際看護学研究室の院生の皆様とディスカッションを重ね、教材の作成にも協力して頂きました。ワークショップの実施においても運営のサポートをして頂いた皆様に心から感謝いたします。特に、博士課程の同期入学でもあり、特任研究員として在籍されていた山路野百合さんには長きに渡ってプログラムを作り上げていく過程に参画して頂きました。研究を進めるにあたってご支援頂いたすべての皆様に、改めて感謝の意を表します

博士課程の院生として改めて研究に向き合うことは自己の成長に不可欠なことと思いながらも、一歩を踏み出すのは勇気のいることでした。そんな時に背中を押してくださった、修士課程で多大なご指導を頂いた国際医療福祉大学特任教授の田代順子先生に深く感謝申し上げます。また、修士課程在籍中からご指導を頂き、博士課程に進んでからも常にあたたかく見守って頂き、ご助言や激励を賜りました長松康子先生に感謝の意を表します。

最後に、私がやりたいことをいつでも応援してくれた両親と夫、そして博士課程在籍中に産まれ、日々元気に成長してくれている息子に、心から感謝申し上げます。

令和 5 年 9 月 19 日

二田水　彩