

博士学位論文

フィジー地域保健看護師の
コミュニティ・オリエンテーションに関する
尺度開発および影響要因とアウトカム探索

Community Orientation of Community Health Nurses in Fiji:
Scale Development and Influencing Factors

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I. Introduction

The Republic of Fiji (hereafter, Fiji) consists of 322 islands spanning 18,272 square kilometres of land. Of the South Pacific Islands, Fiji is the most developed (Asante, Roberts, and Hall, 2011) and has the largest population at 869,458 as of 2015 (Fiji Bureau of Statistics, 2016). Fiji has been undergoing an epidemiological transition as it faces a double burden of disease. Non-communicable diseases (NCDs) have been increasing rapidly due to the westernization of both dietary habits and lifestyle in addition to traditional communicable diseases such as dengue and typhoid fever remaining problematic. Traffic accidents have been also increasing due to developments in transportation networks. Under such circumstances, the Ministry of Health and Medical Services of Fiji (MOHMS) is required a wide variety of services to maintain and promote health in conjunction with clinical treatment (MOHMS, 2013).

The MOHMS has strategized to expand of primary health care (PHC), multi-sectoral collaboration, and evidence-based-practice (MOHMS, 2015). As frontline health workers for the MOHMS, community health nurses (CHNs) in Fiji bring both preventative and clinical services to local communities. In order to provide quality care, CHNs try continuously to understand the diversity of communities through their daily and routine work, share information to create mutual understanding, and encourage individuals and multispectral organizations within the communities to work toward behavioural changes that contribute to healthier lifestyles (Nakaita, 2013). Combined with the active involvement of stakeholders, the passion of CHNs and their careful attention to ongoing community activities enables successful health promotion of community as a whole.

Community orientation defined by Proenca (1998) is a health management model that would enable hospital organizations to contribute more to community health promotion. The model consists of a set of activities performed by hospital organizations in conjunction with other institutions.

Proenca (1998) defined community orientation as organization-wide generation, dissemination, and use of community intelligence to address present and future community health needs with regard to two necessary capacities: community sensing and community linking. This process is known as “nursing process”, “Plan-Do-See” and “Plan-Do-Check-Act cycle”, respectively, in community health nursing. These two capacities are listed in the Competency Standards and Criteria for Community Health Nurses in Fiji (hereafter Competency CHNs Fiji, MOHMS, 2007). Therefore, although Proenca conceptualised community orientation for hospital organizations, it should be applicable for CHNs in Fiji as well, as CHNs also provide both clinical treatment and health promotion services to communities.

Competency indicates abilities to carry out job performances (Kato, 2011). It is characterised by knowledge and skills, self-concept, and motives and traits. Knowledge and skills are visible and easy to evaluate, and can be developed, whereas motives and traits are hidden, central to personality and difficult to change and be developed. Self-concept, are also hidden and influenced by motives and trait. However, it can also be developed through training (Spencer L and Spencer S, 1993). Even individuals with sufficient knowledge and skills cannot perform tasks effectively without adequate attitude (Ibe and Nakanishi, 2004). Therefore, it is important that CHNs adequate self-concept is present in order to ensure effective provision of health care services.

Several factors affect CHN task performance. With the recent health policy reform, clinical services have been decentralized to health centres. This shift has required CHNs to spend more time for providing outpatient care at their facilities. Working environment also impedes their work. With the exception of special events such as outreach team visits, CHNs usually work alone in their assigned communities, and therefore do not have many opportunities to mimic and received advice from senior CHNs.

There are no community health activities manuals that CHNs can simply follow step by step. Community health activities need reflect on community

health needs and depends on people in the area. CHNs need understand continued changing situations and environment, and involve stakeholders who influence and affect the needs. Rather than instructing community members in what they should do, CHNs try to promote community ownership. The gradual accumulation of these small steps taken by CHNs leads to increased motivation among community members to change their behaviour to yield better health. Senior nurses have built their capacity through meaningful yet bitter experiences that have sharpened the effective management of community health activities. However, these experiences are intangible and thus difficult to convey verbally to junior CHNs. Development of a scale to measure self-concept with regard to community health information (i.e., a community orientation scale), will enable CHNs to objectify their attitudes. Such a scale could also be used for career development or as an education tool for nursing supervisors and nursing education programs. The various factors influencing community orientation identified here will enable policy makers to develop a system of support.

II. Fiji: Country profile and national health status

1. Country profile

The Republic of Fiji (Fiji) consists of 322 islands that cover a total of 18,272 square kilometres of land (Figure 1). Of all the South Pacific Island countries, Fiji is the largest, with a population of 869,458 (Fiji Bureau of Statistics, 2015) and the most developed (Asante, Roberts, and Hall, 2011), with a GNI (gross national income) of 4,870 USD/capita in 2015 (United Nations, The United Nations Children's Fund, UNICEF, 2016). The three major sources of income are from tourism, sugarcane, and garment production. Airports in Fiji serve as hub airports for neighbouring countries, and international and regional agencies such as the University of South Pacific and the headquarters for the Pacific Islands Forum (PIF, a Pacific regional collaboration agency) are located in Fiji's capital city (Pacific Island Centre, 2011).

The two major ethnic groups in Fiji are the I-Taukei (indigenous Fijians), who comprise 56.3%, and Fijians of Indian descent, who comprise 37.5% of the population. Fijians of other descent include Chinese, European, part European, Rotuman, and other Pacific Islanders (data based on a 2007 census, the Embassy of Fiji in Japan). The two major vernacular include Fijian and Hindustani, but English is the official language and widely understood in the cities (Embassy of Fiji in Japan).

Graduation rate from primary school was 97%, and net enrolment ratios for secondary school were 79% and 88% for male and female students, respectively

(administrative data from 2008-2012, UNICEF,

2016).

Higher



Figure1: Map Fiji (source: Embassy of Fiji in Japan website, 2015)

education is offered at the three universities in Fiji (UNESCO, 2011).

2. National health status

The World Health Organization (WHO) appreciated Fiji's health status as having met or exceeded WHO goals for 2000, due to sound comprehensive healthcare programs and the untiring efforts of the MOHMS in promoting healthy living for the population (WHO Western and Pacific Regional Office, WPRO, 2011). Fiji's national health indicators compare favourably with those in other South Pacific Islands countries (WPRO, 2011). Table 1 shows selected health and population indicators of Fiji and Japan (UNICEF, 2016).

Life expectancy at birth has increased, from 68 years in 2005 to 70 years in 2015. Total fertility rate has declined, from 2.8 in 2005 to 2.5 in 2015. The natural growth rate over 25 years (1990 to 2015) was .8%, indicating a moderate increase, but the emigration of skilled individuals (so-called 'brain drain') is a major concern for the country (Fiji Times, 2011). The rate of urban population has stabilized somewhat, with rates of 53% in 2005 and 54% in 2015.

Maternal and child health indicators generally show improvements. The infant mortality rate declined, from 21 in 2005 (MOHMS, 2006) to 19 per 1,000 live births in 2015, boasting 100% of skilled birth attendances (UNICEF, 2016). The under-five mortality rate also dropped, from 26 in 2005 (MOHMS, 2006) to 22 per 1000 live births in 2015, which ranks Fiji 88th among 195 countries (UNICEF, 2016). The maternal mortality ratio, however, has increased slightly, from 50 in 2005 to 59 per 100,000 live births in 2015 (UNICEF 2016). The main causes of maternal death from 2001 to 2007 were ectopic pregnancy, PET (pre-eclamptic toxemia)/eclampsia, postpartum haemorrhage, cardiac disease, and septicaemia (Ministry of National Planning Fiji, 2010). These causes were linked to the fragile transportation system that is characteristic of small islands. In addition to early detection and a follow-up system, further countermeasures such as improved infrastructure, emergency transportation systems, and upgraded facilities are necessary.

With regard to sanitation, use of improved drinking water sources have improved substantially, from 47% in 2005 (MOHMS, 2006) to 96% in 2015 (UNICEF, 2016). However, infectious diseases remain problematic, as exemplified by the 600 typhoid cases and 25,249 diarrhoea cases in 2012 (MOHMS Fiji, 2013).

Fiji has been undergoing an epidemiological transition, and currently faces a double burden of communicable and non-communicable diseases. The three diseases with the highest mortality rates in 2012 were diabetes mellitus at 21.5%, hypertension at 13.1% and ischaemic heart disease at 11.1%, all classified as NCDs (Table 2). Diabetes and its complications as well as hypertension and cardiovascular disease accounted for 98.5 per 1,000 hospital admissions. Amputation rate for diabetic sepsis was 41.5 per 100 admissions in 2012 (MOHMS, 2013).

Communicable diseases also remain a substantial challenge for the population of Fiji. Infectious and parasitic diseases were ranked the second leading cause of morbidity in 2012, accounting for 10.5% of these cases (Table 3). Incidence of typhoid has increased substantially over the past decade and dengue fever outbreaks have also occurred every five to eight years. In addition to these, a constant trend of fatal motor vehicle accidents has been observed (MOHMS, 2013). Given these circumstances, the MOHMS is required to offer a wide range of services.

Table 1: Basic Health Statistics

	Fiji 2005	Fiji 2015	Japan 2015
Population (1,000)	849 ^a	892	126,573
Crude birth rate (per 1,000 population)	21 ^a	20	8
Crude death rate (per 1,000 population)	7 ^a	7	10
Life expectancy at birth (years)	68 ^b	70	84
Rate of natural increase (%)	1.1 ^{1)b}	.8 ²⁾	.1 ²⁾
Under five mortality rate (per 1000 live births)	26 ^a	22	3
Under five mortality rate world ranking	121 ^b	84	182
Infant mortality rate (per 1000 live births)	21 ^a	19	2
Maternal mortality ratio (per 100,000 live births)	75 ^b	59	5
Total fertility rate (no. children per woman) ³⁾	2.8 ^b	2.5	1.4
Gross national income (US\$/capita)	3280 ^b	4870	42,000
Use of improved drinking water source (%)	47 ⁴⁾	96	100
Use of improved sanitary facilities (%)	72 ⁴⁾	91	100
HIV prevalence rate (%) among adults aged 15-49 years	.1 ^b	<1.000 ⁵⁾	N/A
Enrolment ratios male/female (%)	97/96 ^{6)b}	105/106	102/101
At least one antenatal care visit (%)	N/A ^b	100	N/A
Skilled birth attendance (%)	99 ^b	100	N/A
Urban population (%)	53 ^b	54	93

1) 1990-2005

2) 1990-2015

3) The average number of live births a woman would have by age 50 if she were subject, throughout her life, to the age-specific fertility rates observed in a given year. This calculation assumes no mortality (UN sustainable development knowledge platform).

4) 2004

5) 2014

6) Latest available in 2000-2005

Sources:

a: 2005 Annual Report, Ministry of Health Fiji; b: The State of the World's Children 2007

2015 data: The State of the World's Children 2016

Table 2: Leading Causes of Mortality in Fiji in 2012

No.	Cause of Death	Cases	%
1	Diabetes mellitus	1,452	21.5
2	Hypertensive disease	888	13.1
3	Ischemic heart disease	754	11.1
4	Other heart diseases	384	5.7
5	Symptoms, signs, and abnormal clinical and laboratory findings not classified elsewhere	243	3.6
6	Chronic lower respiratory system diseases	228	3.4
7	Genitourinary diseases	184	2.7
8	Other external causes	156	2.3
9	Cerebrovascular disease	152	2.2
10	Certain conditions originating in the prenatal period	128	1.9

Source: Ministry of Health Fiji Annual Report 2013

Table 3: Leading Causes of Morbidity in Fiji in 2012

No.	Disease Classification	Cases	%
1	Respiratory diseases	5,016	10.6
2	Infections and parasitic diseases	4,953	10.5
3	Circulatory diseases	4,092	8.7
4	Injury, poisoning, and other external causes	3,415	7.2
5	Genitourinary diseases	2,617	5.5
6	Digestive diseases	2,419	5.1
7	Endocrine, nutritional, and metabolic diseases	2,402	5.1
8	Diseases of the skin and subcutaneous tissue	2,140	4.5
9	Neoplasm	1,597	3.4
10	Certain conditions originating in the prenatal period	1,435	3.0

Source: Ministry of Health Fiji Annual Report 2013

3. Health services in Fiji

The mission declared by the MOHMS is to “empower people to take ownership of their health and assist people in achieving their full health potential by providing quality preventative, curative, and rehabilitative services through a caring sustainable health care system”. Key strategic directions employed include the expansion of primary health care (PHC), multi-sectoral collaboration, and evidence-based practices and wellness setting approach (MOHMS, 2015). A setting is defined as a context in which individuals create or solve problems related to health, and can normally be identified as having physical boundaries, a range of people with defined roles, and organizational structures such as schools, work sites, hospitals, villages, and cities (WHO).

These services are delivered through three main divisional hospitals, 10 sub-divisional hospitals, over 80 health centres and 99 nursing stations (2014

data from MOHMS, 2015).

The MOHMS issues five-year strategic plans, annual corporate plans, and annual reports. Four divisional health services and 18 sub-divisional offices also issue annual business plans and annual reports.

4. System and status of nurses in Fiji

Registered nurses are graduates of any of the three-year programs and have passed the examination by the Nursing Council of Fiji (MOHMS, 2015). Their licenses are renewed yearly by attending and completing training (Japan International Cooperation Agency, JICA, 2014). Nurses in Fiji are recommended to work in both public health and clinical services. A term for a nurse at any given facility may vary depending on the individual's career and life plans (JICA, 2005). The CHNs tend to stay two to four years at one facility (JICA, 2005). As an example, one fifth of nurses were transferred between January and March, and roughly 400 transfers were made in 2012 (JICA, 2014).

Staff turnover is a major concern in nursing (Baker, Russell, 2008). Fiji Times (2009) reported emigration from Fiji on an average of 109 nurses or former nurses. Turnover is especially high among nurses working in remote areas, for various reasons that may include hard living environments, interpersonal relationship issues with people in the communities or supervisors, and the desire for better quality education for their children (JICA, 2014). The Fiji government has increased the number of new recruits to 200 nurses per year from 2014 to 2019 (JICA, 2014).

5. System and status of community health nurses in Fiji

The CHNs in Fiji are frontline health workers for the MOHMS and work the closest to people in communities and settings. The CHNs include maternal and child care (MCH) nurses, outpatient/special outpatient nurses, zone nurses, and district nurses. Recently, mental health and home visit nurses have also become established to provide community care. Zone nurses and district nurses

provide health promotion services to assigned zones or districts. Zone nurses work in health centres with CHN colleagues, physicians, or nurse practitioners. CHN supervisors, nutritionists and health inspectors, and physiotherapists are stationed in main health centres of sub-divisions. District nurses are stationed alone in nursing stations of assigned district areas where people do not have easy access to health centres. Although supervisors and other health workers may occasionally accompany zone and district nurses for outreach activities or special matters in communities, zone and district nurses typically visit communities by themselves. In average, one zone or district nurse covers 10 communities, 1700 people (Baker, Russell, 2009, JICA, 2005) and provide treatment for common diseases, immunization, screening, domiciliary care, health promotion, and disease prevention.

Supervisors of CHNs, sub-divisional health sisters, and health sisters are stationed in the main health centre in each sub-division except the capital city where health sisters are stationed all health centres.

6. Competency standards and criteria for community health nurses in Fiji

Competency Standards and Criteria for Community Health Nurses in Fiji (Competency CHNs Fiji) was developed through collaborative efforts between JICA and the MOHMS (MOHMS, 2007). Task force members worked for over two years, beginning in 2005, and organized three workshops with various stakeholders to discuss the framework and contents. Table 4 shows the outline. The Competency CHNs Fiji is used for CHNs' self-assessment and supervisors' assessment conducted quarterly. Community assessment, planning, and evaluation are included in management skills.

Table 4: Contents of Competency Standards and Criteria for Community Health Nurses in Fiji

The Competencies Standard and Criteria for Community Health Nurses Fiji	
Core/Functional Competencies	Generic Competencies
<ul style="list-style-type: none"> - Therapeutic and Caring Relationships - Management Skills - Knowledge and Skills - Management of Emergency Situation - Quality Improvement and Risk Management 	<ul style="list-style-type: none"> Personal Competencies <ul style="list-style-type: none"> - Functionality - Professional Development and Continuing Education - Critical Thinking and Analysis People and Team Competencies <ul style="list-style-type: none"> - Leadership - Teamwork - Communication - Attitude Organizational Competencies <ul style="list-style-type: none"> - Professional and Ethical Practice - Organizational Value - Accountability

Source: The Competency Standards and Criteria for Community Health Nurses in Fiji (MOHMS, 2007)

7. International cooperation in health

Various international multilateral and bilateral organizations support the MOHMS. The Australian aid has been the leading donor to Fiji that offered a wide range of support amounting to AUD\$5 million per year for the past 5 years since 2011 (Australian Government Department of Foreign Affairs and Trade, 2015) for health improvement causes. To support capacity building among supervisors, the JICA supported to improve an in-service training system for CHNs for a total of 8 years, from 2005 through 2008 as well as from 2010 through 2015 (JICA, 2014).

III. Literature review

1. Community assessment

1) Definitions and outline

Community assessment has been defined in many ways (Anderson, and McFarlane, 2004; American Public Health Association, 2006; Rowe, McClland, and Billingham, 2001; Escoffery, Miner and Trowbridge, 2004; Hirano, 2004). The Institute of Medicine (IOM, 1988) in the US defined community assessment as “an understanding of determinants of health and the nature and extent of community need, which is a fundamental prerequisite to sound decision making regarding health”. The IOM (1998) stressed the importance of collecting not only quantitative data from documents but qualitative information as well.

Community assessment is an essential process required for evidence-based public health policy and practice (Mizushiwa, 2000). The purpose of community assessment in nursing is to identify factors that impinge on people's health in order to develop strategies for health promotion activities (Anderson and McFarlane, 2004). Thus, community assessment itself is neither a purpose nor an independent activity. It is a process that public health nurses (PHNs) constantly have on their minds as they conduct their daily routine work (Nakaita, 2013). The PHNs continually try to expose new facts related to people's lives in order to understand the great diversity of communities and analyze the relationship between their lifestyles and health (Ministry of Health and Labour of Japan, 2012).

Community assessments are sometimes not termed as such, and are instead called community planning processes or community diagnoses (Myers and Stoto, 2006). Community profiling is the most popular term used in Fiji.

2) Community assessment models

Procedures and details of community assessment are found in various community health planning and evaluation models, such as the Precede-Proceed Model by Green and Kreuter (2005) and the Planned Approach to Community

Health by the Centers for Disease Control and Prevention (Kreuter, 1992). These applications have also included business management models such as the “Plan-Do-Check-Act” originally developed by Walter Andrew Shewhart and William Edwards Deming (Best and Neuhauser, 2006) and project management models such as the “Plan-Do-See” created by the Foundation for Advanced Studies on International Development (2007).

Community assessment is a core function of nursing, and a logical and systematic approach is required to identify community health needs, strengths, and resources (Shuster, 2010). Glittenberg (1974) developed the “Project GENESIS” that aimed to assess comprehensively the community situation using statistical information and descriptive study methods (Kanekawa, and Takada, 2011). Anderson and MacFarlane (1988) developed the Community-as-Client Model based on B. Neuman’s system model. Later on, this model was modified to a Community-as-Partner Model based on the PHC concept (Anderson and McFarlane, 2015). The models provide step-by-step descriptions of the structures and procedures involved in community assessment.

2. Competency

1) Definitions and outline

Competency is the ability to execute or perform a job (Kato, 2011). The concept of competency is believed to have originated in the legal profession as well as in the field of industrial psychology during the 1980s (Axley, 2008). Definitions of competency vary (e.g., McClelland, 1978; Voyatis, 2008; Aihara, 2002; Kato, 2011) and levels of identified abilities or underlying characteristics have been extended to leadership roles and details of knowledge in specialized fields (Mizusawa, 2006). Spencer L. and Spencer S. (1993) published “Competence at Work: Model for Superior Performance,” enabling competencies to materialize into practice in many workplaces (Lucia and Lepsinger, 1999). Spencer L. and Spencer S. (1993) defined competency as “an underlying characteristic of an individual that is causally related to criterion-referenced

effective and/or superior performance in a job or situation”.

Some competency models comprise multiple characteristics while others indicate specific ones (Kato, 2011). Spencer L. and Spencer S. (1993) characterized competency in three layers in their Iceberg Model: motives and traits, self-concept, and knowledge and skills. Knowledge and skills are visible, easy to be developed and evaluated, while motives and traits are hidden yet central to forming one's personality and difficult to develop and evaluate. Self-concept, including attitudes and values, is positioned between knowledge/skills and motives/traits, and can be developed or improved through training, psychotherapy, and/or positive developmental experiences, albeit with more time and difficulty (Spencer L. and Spencer S., 1993).

On the basis of trait and motive, people acquire knowledge through education and master skills through experiences. Knowledge and skills cannot be demonstrated until proper attitudes and values are acquired (Ibe and Nakanishi, 2004). Therefore, self-concept competencies, i.e., attitudes, values, and perception, should be developed through training in addition to knowledge and skills.

Maurer, Wrenn, Pierce, Tross, and Collins (2003) conducted a questionnaire study of 48 competencies that were classified into three components: knowledge and skills, self-concept, and traits in order of believed improvability (from most to least improvable). Maurer concluded that findings were consistent with the Iceberg Model of competencies.

2) Competency in nursing

Boards of nursing in various countries began to explore the issue of competencies for graduating nurses in the early 1980s. Then, in the 1990s, the rapidly changing health care environment led nursing to continue its efforts to create safe environments for patients (Tilley, 2008). International Council of Nursing (ICN) published “ICN Framework of Competencies for Generalist Nurse (hereafter ICN competencies)” in 2003. Based on this framework, competency

standards were developed in Southeast Asia and western Pacific countries (Alexander MF, Runciman, 2003).

3) Studies on competency within public and community health nursing

A search for publications was conducted in July 2014 within Full Text database of CINAHL Plus (CINAHL) to review measurement instruments, influencing factors, and competency outcomes of PHNs and CHNs, using the keywords: *competency, scale or instrument, public health nurse, and community nurs*’. Articles that had an abstract and were published after 2004 were included, while non-English articles and articles that discussed particular programs such as HIV/AIDS immunizations, or those targeting students or allied public health workers were excluded. Following these search criteria, six articles were retrieved and analyzed. Two competency standards found in the references were added for analysis.

Table 5 shows the domains and categories of the eight articles sorted by the domain framework of the ICN competencies. The domains in the standards are called either skills, competencies, or characteristics. The competencies varied according to the missions and the scopes of the organizations. All competencies included community management, i.e., community assessment, planning, intervention, and evaluations. Five articles independently identified professional, ethical, and legal practices such as communication skills and leadership as competencies, while Public Health Nursing Competency Instrument (Sharon Cross, et al., 2006) included those items into the management domains. Quad Council Competencies for PHNs in the US (2011) and Nursing Public Health Competencies Grid of Performance Element (Kalb et al., 2006) independently listed cultural competencies. The Canadian Community Health Nursing Professional Practice Model & Standard of Practice (2011) independently listed access and equity. Professional development was listed in the four competencies standards.

Guo et al. (2008) found that PHNs scored high on cooperation with community-based healthcare services, community resource integration, and community group operations, and low on bio-statistical application, community health promotion activities initiation, and application of epidemiology.

Table 5: Competency Domains of General Nurses and Public/Community Health Nurses: Sorted by ICN Framework

ICN Framework of Competencies for General Nurses (2003)		
Professional, ethical, and legal practices	Care provision and management	Professional development
Canadian Community Health Nursing Professional Practice Model & Standard of Practice (2011)		
-Professional relationships -Access and equity -Professional responsibility and accountability	-Health promotion -Prevention and health protection -Health maintenance, restoration, and palliation	-Capacity building
Quad Council Competencies for Public Health Nurses (2011) US		
-Communication skills -Leadership and systems thinking skills -Cultural competencies and skills	-Analytic and assessment skills -Policy development/program planning skills -Community dimensions of practice -Financial planning and management skills	-Public health science skills
Quad Council Public Health Nursing Competency Instrument Final Abbreviated Scale, Dawn, et al. (2013) US		
- Partnership/Collaboration	-Evaluation -Individual/family/community -Systems -Planning -Assessment	
Nursing Public Health Competency Grid of Performance Elements, Kalb et al. (2006) Seattle; and King County, Washington State, US		
- Leadership/system thinking - Cultural Competency	- Assessment - Policy development/program planning - Evaluation - Basic public health science: health promotion/disease prevention - Communication - Partnership, collaboration, and community dimension - Leadership/system thinking	
Competency Standards for the Community Health Nurse, 1 st edition (1998) South Australia		
-Professional and ethical practices -Enable interaction	-Manage client care in the community -Promote health and maintenance of well-being in the community -Manage defined community health nursing practice	
Public Health Nurse's Professional Competency Scale Basic-Care Competency, Lin, et al. (2010) Taiwan		
	- Community-based competency (coordination and management) - Teaching competency	- Self-development competency

Table 5 (continued)

Self-Assessment for Professional Competency, Guo et al. (2008) Taiwan		
- Leadership	<ul style="list-style-type: none"> - Community assessment - Community health diagnosis - Application of epidemiology - Biostatistical application - Community group operation - Community health program planning - Community health promotion activities - Community resource integration initiation - Cooperation with community-based healthcare services 	
Public Health Nursing Competency Instrument, Cross et al. (2006) US		
	<ul style="list-style-type: none"> - Competencies for assessment - Competencies for population-based planning - Competencies for implementing intervention - Competencies for evaluation of process and outcomes 	

Domains in bold are categorized into multiple domains of ICN domains.

Table 6 shows factors that influence PHN competencies. Guo (2008) in Taiwan administered a questionnaire survey to PHNs regarding community healthcare competencies and collected data from 1,990 respondents. Factors that were found to be significantly associated with respondent competency scores included implemented task frequency, years of work as a PHN, job position, education level, and location of health station (non-remote/remote). Cross et al. (2006) also conducted a questionnaire survey regarding a PHN competency instrument to 120 PHNs. Characteristics of PHNs that were positively associated with self-rated competency included the number of years in current position, years working as a PHN, years working as a PHN in a public health agency, percent of time spent working for individuals/families, total years of PHN work that focused on individuals/families, total years of PHN work that focused on community, and the participation (total number) in workshops with public health-related content.

Table 6: Factors Influencing PHN Competencies

	Community Healthcare Competencies for PHNs in Taiwan (Guo et al., 2008)	Public Health Nursing Competency Instrument in US, (Cross, et al., 2006)
Background information	<ul style="list-style-type: none"> - Age - Years of work as a PHN - Job position 	<ul style="list-style-type: none"> - Years in current position - Years working as current PHN position - Years working as PHN in a public health agency - Years of PHN work focused on individual/family - Years of PHN focused on community
Education	<ul style="list-style-type: none"> - Education level 	<ul style="list-style-type: none"> - Number of public health content workshops
Working environment	<ul style="list-style-type: none"> - Location of health station (non-remote/remote) - Task frequency 	<ul style="list-style-type: none"> - Percent of work that targeted individuals/families

3. Community orientation

1) Outline of research

A search for publications was conducted through CINHALL in December 2014 to review scales, factors, and outcomes pertaining to community orientation. Search phases: *Community orientation* and *community health orientation* were applied, and non-English articles and articles without abstracts were excluded. The database revealed 31 articles. After excluding articles that were opinions, news releases, reports, case studies, articles without details about community orientation, and articles not available in Japan, 19 articles were reviewed. One article not identified by the search but found through cross-referencing added in the analysis because it pertained to a scale developed to measure orientation for community health concepts.

Regarding study design, 16 articles were quantitative studies, 3 were qualitative studies, and 1 comprised mixed methods. Of the 16 quantitative studies, 8 analyzed hospital services, 6 assessed certain public health programs, 1 compared national health systems in the OECD countries, and one developed a community orientation scale. Of the eight hospital service analyses, six analyzed structures and services of acute hospitals in the US, while the other two analyzed ambulatory services in Taiwan. Oliveira SA et al. (2009) implemented a questionnaire survey on tuberculosis control services in Brazil. The study identified that health professionals in tuberculosis control services

had low scores in community orientation. They found that health professionals in the tuberculosis control services had low scores in community orientation. Ferreira et al. (2011) studied on malaria control services in the Amazon region of Brazil using the PCAT (Primary Care Assessment Tool). They reported that “71% of the interviewees reported that health care professionals do not ask about their living conditions during the consultation”. Challis et al. (2002) compared service arrangements at old psychiatric hospitals in England and found that the degree of community orientation differed among organizations. Clancy et al. (2003, 2004, and 2007) compared the degree of community orientation among type II diabetes patients using the PCAT and found that the degrees of community orientation in all of the intervention groups were higher than in those in the control groups.

There were following three qualitative studies found by the search. Proenca (1998) developed the concept of community orientation described below. Haggerty et al. (2012) defined characteristics of PHC models in the Canadian context using the Delphi technique. The study identified community orientation as one domain of PHC work in Canada. Rodrigues and Witt (2013) identified competencies for preceptors in the Brazilian health care system using the Delphi technique and revealed 49 competencies classified in nine domains including community orientation.

The mixed methods study was conducted by Muldo et al. (2010), who analyzed the degree of community orientation in four different PHC models in community health care organizations in Ontario, Canada using PCAT and interviews.

2) Definitions and outline

Community orientation refers to community health information that hospitals organizations should reflect. There were two definitions found both from the US between the late 1990s and early 2000s.

In the US in the 1990s, local tax authorities and community groups

argued that hospitals that failed to play a significant role in improving community health should not receive tax exemptions and other similar support (Proenca, Roko, and Zinn, 2000). The American Hospital Association (AHA) thus proposed the concept of community care networks, wherein hospitals collaborate with other providers and local organizations to deliver a seamless continuum of care within a limited set of resources (Proenca, et al. 2000). Communities also have grown increasingly interested in disease prevention and called for the integration of healthcare quality with broader public and community health objectives (Kang, and Hasnain, 2013).

Proenca (1998) derived the concept of community orientation from that of market orientation, i.e., one that represents superior skills in understanding and satisfying customers. He defined community orientation as “the organization-wide generation, dissemination, and use of community intelligence to address present and future community health needs as a set of activities that health service organizations must perform in conjunction with other institutions, to manage community health” (Table 7). Two capacities necessary for effective generation and response to community health needs are community sensing and community linking. Community sensing is the ability to learn more about community through the structured, ongoing process of tracking community events and trends. Community linking indicates the ability to create and manage close relationships with community organizations. Figure 2 displays factors that influence the capacity for community sensing and linking and act as antecedents to community orientation in health service organizations.

Table 7: Definitions of community orientation

Researchers (year)	Definitions
Proenca (1998)	As a set of activities that health service organizations perform in conjunction with other community institutions to manage community health, community orientation is the organization-wide generation, dissemination, and use of community intelligence to address present and future community health needs.
Starfield et al. (1998), Shi et al. (2001)	Care provider knowledge of community needs and involvement in the community

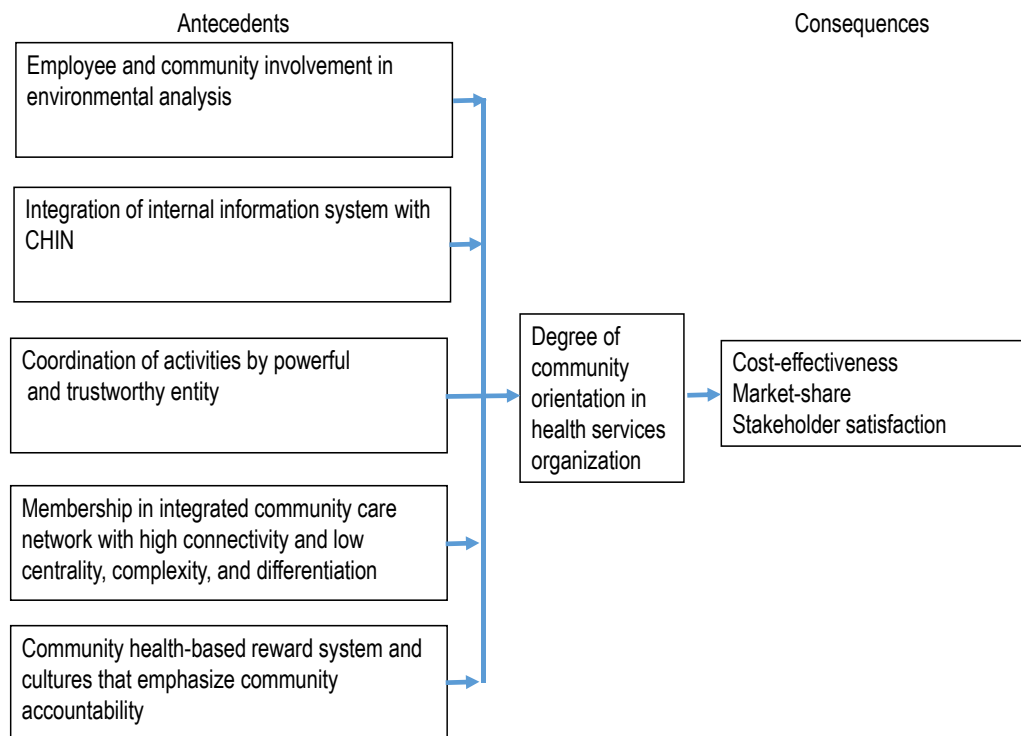


Figure 2: Antecedents and consequences of community orientation in health services Organizations
Proenca (1988), Community Orientation in Health Services Organizations: The Concept and Its Implementation, Health Care Manage Review, 23(2), p33

Starfield, Cassady, Nanda, Forrest, and Berk (1998) and Shi, Starfield, and Xu (2001) defined community orientation in one of seven domains in the PCAT derived from Primary Care by IOM (1978, 1998) and community-oriented primary care (COPC). According to Starfield et al. (1998) and Shi et al. (2001), community orientation pertains to the health care needs, not only of patients and families being seen by providers, but also those of community members. (Johns Hopkins Primary Care Policy Center). Community orientation in the PCAT was defined as “care providers’ knowledge of community needs and involvement in the community” (Table 7).

3) Instruments for measuring community orientation

(1) Annual survey of the American Hospital Association

In 1994, the American Hospital Association (AHA) began collecting information regarding community orientation activities and services through an annual survey (Ginn, Shen, and Moseley, 2009). Their data set includes

information on organizational policy and structures, staffing, and community collaborations.

(2) Primary care assessment tool (PCAT)

The PCAT is used to assess structures and processes of care and care facilities. The seven domains of PCAT include first contact care, person-focused care over time, comprehensiveness, coordination, community orientation, family-centeredness, and cultural competence (Johns Hopkins Primary Care Policy Center). Multiple versions exist in various languages, target cultures, and targeted populations. Community orientation items comprise home visits, community survey, knowledge of community, and encouragement of family members to become community board members (Barbara, 1998, Shi, 2003).

(3) Community health orientation scale

In 1975, Murphy developed a community health orientation scale consisting of 41 items that measure an individual's degree of adherence to innovative community health concepts in the 1970s: these consisted of primary prevention, population focus, continuity of care multidisciplinary involvement, and prepayment systems.

Of these three scales, the community health orientation scale is unique in that it measures perception rather than implementation. However, it applies community health policies and systems that were newly established in the 1970s in the US, and thus some items (e.g., prepayment systems) are not applicable to other countries. Furthermore, Murphy himself noted that the reliability and validity of some sub-scales had not been fully verified. This may explain why no other studies have reportedly utilized this scale.

4. Analysis and suggestions from the literature review results

Competency standards of CHNs in various countries commonly contented community management, capacity development, and professional, ethical and

regal practice. The Competency CHNs Fiji includes those domains. Competency consisting of knowledge/skills, self-concept, and trait, indicates superior performance (Kato, 2011). It is important for CHNs to acquire proper self-concept because knowledge cannot be demonstrated without proper attitude (Ibe, Nakanishi, 2004).

Community assessment is core function in competencies for CHNs (Shuster, 2010). Community orientation is defined as generation, dissemination, and response of community health information, i.e. implementation and response of community assessment. Community orientation was originally defined for hospital service organizations in the 1990's in the US. Some similarities exist in health care service contexts that pertain to CHNs in Fiji and those in the US in the 1990s. For example, hospitals in the US were required, by both law and by communities, to contribute more to health promotion in addition to their provision of clinical services. CHNs in Fiji are also required to conduct health promotion activities while providing treatment. Concept of community orientation was applied not only hospital organizations but also to PHC policy, PHC services, and competencies for health care professionals in many countries. Therefore, it is applicable also to CHNs in Fiji as well.

Few studies identified details of community orientation for CHNs. Once the details of community orientation for CHNs in Fiji are identified, development of a measurement instrument is possible. Development of community orientation scale for CHNs in Fiji and identification of influencing factors will enable to contribute effective community health activities.

IV. Objectives, operational definitions, and the significance of the research

1. Objectives

This research comprised three studies and was designed to 1) develop a scale to measure community orientation among CHNs in Fiji, 2) examine its reliability and validity, and 3) identify influential factors and outcomes related to community orientation. Specific objectives of each study are as follows:

- 1) Identify items and develop a conceptual framework for community orientation (Study 1).
- 2) Develop a scale to measure community orientation and examine the reliability and validity (Study 2).
- 3) Analyze influencing factors and outcomes related to community orientation (Study 3).

2. Study significance

The identified conceptual framework will enable CHNs to understand necessary attention toward community health needs and community health activities that empower community members to seek healthy lifestyles. The developed scale can be used as a self-assessment tool to highlight strengths and weaknesses of community orientation. The result of self-assessment can also be used for CHN career development plans, and as a coaching tool for supervisors. The scale and the factors identified to influence community orientation will enable policymakers to develop educational materials and support systems. The scale and identified factors can also be used at nursing colleges for curriculum development.

3. Operational definition of terms

This study defines the main terms as follows:

Community health nurses (CHNs): Registered nurses in Fiji working at health centres and nursing stations who are responsible for public health nursing

services in assigned zones or districts. CHNs referred to in this study did not include registered nurses working in individual patient sections of health centres or those who do not work in communities.

Community health activities: Activities coordinated by CHNs with and for people in communities and settings that aim to promote healthy lifestyles and create healthy societies within healthy communities. These include a wide range of activity types, such as lecture-style health education (health talks), physical exercise, cleaning campaigns, and environmental improvement. Community health activities do not include clinical care for and treatment of individual patients, but do include activities that involve community members and stakeholders in establishing support systems for individuals in the community. As such, these typically require long periods of time to conduct.

Community orientation: Direction of feelings, beliefs, values, and perceptions toward the generation and dissemination of, and response to community health needs. The CHNs with high degrees of community orientation actively collect information about community health needs and related issues, disseminate the information among people and stakeholders, and respond accordingly to community health needs. Those CHNs collaborate and work closely with people in various settings and other stakeholders throughout this process.

Community people: Community members who live, go to school, and work in the CHN's catchment area.

Stakeholders: Individuals, groups, and organisations that influence community health activities.

V. Development of a conceptual framework for community orientation by community health nurses in Fiji (Study 1)

1. Objective

Study 1 aimed to identify items and develop a conceptual framework of community orientation.

2. Methods

1) Period and target area

These qualitative interviews were conducted from July through August 2015 in the central division of Fiji.

2) Sample population

Purposive sampling was used to identify a total of 20 participants who would fit into one of the following four groups:

Group 1: Expert CHNs

Group 1 consisted of divisional nursing managers and CHN supervisors with more than five years of experience as CHN supervisors, and community nursing lecturers at a nursing college. Participants were asked to describe the important aspects of the collection, dissemination, and response to community health needs by CHNs. They were also asked to compare the more competent CHNs with less competent ones and identify the reasons behind these differences.

Group 2: Novice CHNs

Group 2 consisted of zone and district nurses with fewer than five years of experience who had ever submitted annual reports and competency evaluations. Participants were expected to describe their attentions and thoughts when collecting, disseminating, and responding to community health needs. They were also asked to describe any difficulties and obstacles about getting to know communities, as well as those involved community people in planning and conducting community activities.

Group 3: Policy makers

Group 3 consisted of a national program advisor, a divisional medical officer, and a sub-divisional medical officer. These individuals were asked to describe the policy direction of community health services and the role of CHNs in relation to the MOHMS.

Group 4: Community representative group

Group 4 consisted of community health workers and a peer counsellor as representatives of community members. Participants were asked to provide their opinions and expectations on community health activities and CHNs.

Groups 1 was the main targets for analysis, while Groups 2, 3 and 4 were established as reference groups to confirm policy directions and community expectations.

3) Data collection

Semi-structured interviews were conducted with each participant and were directed by interview guides for each group. Each interview guide consisted of 1) background information (age, current and past positions, and highest degree obtained) and 2) descriptions and comments on the collection and dissemination of community information and response to community health needs.

Each interview took between 45 and 90 minutes, and were recorded with IC-recorder, with permission from the participants.

4) Data analysis

All interviews and field notes were transcribed verbatim. The data were processed using the content analysis technique. Becoming absorbed in and familiar with the data is essential to gain an understanding of how participants view their world (O'Neil, Cowman, 2008). The phrases or sentences corresponding to, and exemplifying a research theme were extracted as initial codes. These words and sentences were then curtailed to one sentence as secondary codes. The secondary codes were consolidated to form sub-categories,

which were then combined and contextualised into categories. Similarity and disparity were considered during the extraction process.

Each group was considered a unit for analysis. Categories from Group 1 were compared with those from the other three groups in order to analyze conflict and missing codes.

3. Ethical considerations

The following statements were made in the letters sent to the participants and their directors requesting their study participation:

- Participation in this research is voluntary. Participants had the right to refuse to participate or withdraw from the research at any time without incurring any disadvantage.
- There are no disadvantages if a participant does not participate in the research.
- All statements would be anonymous. Obtained data would be saved in a USB memory drive secured with a password. Data from the interviews would be used only for the research purposes.

This study was approved by the Fiji National Health Research Ethics Review Committee (2014.122.MP) and the Institutional Review Board for Research Ethics of Aichi Prefectural University (26APU-UGA2-15).

4. Findings

1) Participant characteristics

~~We interviewed~~ A total of 20 subjects were interviewed. The expert CHN group consisted of nine participants: three divisional nursing managers, three sub-divisional supervisors, and three community nursing lecturers in a college of nursing in their ages range from 30s to 60s. Eight had diplomas in nursing, seven had baccalaureate degree in nursing science, five had completed postgraduate public health courses, and one had master in public health. Experience as a CHN ranged from 3 years to more than 20 years. One lecturer without any supervisory experience was recommended due to his outstanding

work as a CHN. This participant had obtained master in public health so that he would be able to bring broader perspectives when lecturing on various research themes. Other participants in this group had more than 10 years of experience as supervisors.

The novice CHN groups consisted of five CHNs in their ages range from 20s to 30s with one to four years of experience as CHNs. All participants in this groups had diplomas in nursing with 3 or fewer years of experience as a CHN.

The policy maker group comprised three participants: one national program director, one divisional medical officer, and one sub-divisional medical officer, all of whom were in their 50s and had graduated from medical school. One had master in public health.

The community representative group consisted of three participants: two volunteer health workers in their 60s and one peer educator in the 20s.

Table 8: Information of the participant

	Expert CHNs (9)		Novice CHNs (5)	Policy makers (3)	Community representatives (3)
	DHS*/CHN supervisors (6)	Lecturers (3)			
Age (years)					
20-29			3		1
30-39		1	2		
40-49	1	1			
50-59	5			3	
60 and above		1			1
CHN experience (years)	3-20+	5-20+	1-3	-	-
Supervisory experience (years)	12-18	0-20+	-	-	-
Education					-
Diploma in Nursing	6	2	5		
Bachelor of Nursing	4	3			
Science		1		1	
Master of Public Health	4	1			
Postgraduate Public Health				3	
Medical school					

*DHS: Divisional Health Sister

+: more than

2) Components of community orientation: group of expert CHNs

The interviews extracted a wide range of information concerning collection and dissemination of, and response to community health needs. The

expert CHNs recalled their own experiences as staff CHNs working in communities. They also provided actual examples of how they advised their subordinate or student nurses. Extracted initial codes were consolidated into 51 secondary codes. The categorisation drafts were created and revised repeatedly. Advice and comments to the drafted framework were received from participants, Fiji health researchers and experts, and dissertation advisors, and then were incorporated into the analysis. After careful reconsideration and reconstruction of categories, the analysis was finalised as three main categories:

- (1) Mutually trusting relationships with community people aimed at empowerment,
- (2) Collaborative activity management based on Plan-Do-Check-Act cycle,
- (3) Commitment toward work and people in the community.

Table 9 shows the 13 sub-categories of the three main categories.

Table 9: Category and Subcategory from interviews: expert CHN group
Theme: Features of CHNs with regard to the generation and dissemination of, and response to community health needs.

Category 1: Mutually trusting relationships with communities aimed at empowerment	
Sub-category	(1) Pay careful attention in order to be accepted by the community people
	(2) Be reliable and trustworthy toward community people
	(3) Have compassion and understand the culture and lives of community people
	(4) Help people understand the CHNs themselves
	(5) Strengthen relationships with stakeholders to collaborate in activities
Category 2: Collaborative activity management based on Plan-Do-Check-Act cycle	
Sub-category	(1) Aim for social well-being
	(2) Learn about community people from community people
	(3) Implement needs assessment with resource people
	(4) Plan community health activities with resource people, aiming for behavioural change and empowerment
	(5) Effectively implement, follow up, and evaluate activities
3) Commitments toward work and community people	
Sub-category	(1) Perceive responsibilities to community people
	(2) Continue professional development
	(3) Promote teamwork

- (1) Mutually trusting relationships with community people aimed at empowerment

It was essential for CHNs to establish close relationships with community people so that community people were willing to voice their concerns

to CHNs. Establishing mutual trusting relationships that aimed for empowerment required great efforts by CHNs, who paid careful attention to be accepted by community people, reliable for community people, showed compassion and understand culture and people, expressed their opinions and showed their personality so that the community could become familiar with CHNs, and intentionally got closed to stakeholders who might contribute or influence community health activities.

① Pay careful attention to be accepted by community people

The CHNs showed respect and reverence to people in their communities and tried to communicate in an approachable and friendly manner so that the community people were easily abled to talk to the CHNs. They changed their tone and way of talking according to the age and social status of community people as well as the given situation at hand. They reviewed their conduct and attitude toward community people on a daily basis. They intentionally visited communities frequently and often more than was needed for their main purposes, in order to maintain these relationships. Those with vast experience in communicating with those of different social statuses and at different occasions effectively showed respect and reverence to the community people.

② Be reliable and trustworthy for community people

The CHNs tried to respond to enquiries and requests in an accurate and timely manner. If they were not sure about questions and comments, checked references and returned to the individuals. They also tried to fulfil any promises they made. Their situations sometimes created difficulties for these endeavours, however, due to poor weather or unexpected orders from their departments. They tried to provide valuable information, especially in the first meeting with community people, because they believed that their first impression was long-lasting. They also tried to contribute to community social activities such as fund-raising events and funerals. They gained the trust of community people by

providing good clinical care that respected patient privacy and confidentiality.

③ Show compassion and understand the culture and lives of community people

The CHNs tried to share in the experiences of community people: when the community experienced pain, they also felt their pain and expressed empathy. They showed their respect for the culture and traditions of communities and tried to live in a similar manner with the community, eat local food and speak the local dialect. They tried their best to think in a way that reflected the community perceptions, and tried to understand their situations.

④ Help people understand CHNs

The CHNs tried to explain their roles and tasks to community people so that the latter could know what to expect from CHNs. They were aware that community people were curious about them, especially those who were newly assigned young nurses in rural areas. They tried their best to field any personal questions and comments. They also tried to express their thoughts to community people. They knew that finding common ground with the community people created a closeness and sense of connection with the CHNs.

⑤ Strengthen relationships with stakeholders to collaborate in activities

The CHNs intentionally approached stakeholders and potential resource people to create and maintain relationships. They contacted these individuals by phone or visited them when they were nearby.

(2) Collaborative activity management with collaboration based on Plan-Do-Check-Act cycle

This category consists of a set of managements that are necessary for effective community health activities. Study participants described the knowledge and skills, as well as the perception and attitude necessary for the management process.

The CHNs followed every step in this category together with stakeholders based on a mutually trusting relationship. One interviewee commented *‘Information that CHNs need is not in their office, but in their communities. They have to go and learn in the communities (E-6)’*.

The CHNs tried to focus on behaviour change and empowerment of community people, rather than on activity implementation. They learned about communities from community people, assessed the needs of and planned with community people, and implemented, followed up, and evaluated activities.

① Aim to affect behavioural change and empowerment

The CHNs were interested in health promotion more than clinical services. They focused on social problems and tried to relate them to health subjects. They tried to target community groups and settings rather than individuals. They were not satisfied with just implementing their tasks but tried to focus and ensure their outcomes; namely, behaviour changes and an improved health status of community people.

② Learn about community people and culture from community people

The CHNs required medical and nursing knowledge to collect information, but they were also interested in community members, the local cultures, and social activities. They tried to collect information about social and cultural aspects, daily living, and what norms existed in their communities. They also observed behaviours and relationships among community people, as well as their preferences during daily routine services. They tried to involve community people in information collection activities and collected information on any stakeholders and external organisations that CHNs might work with or utilize.

③ Implement needs assessment with community people

The CHNs also collected both qualitative and quantitative information using their medical and nursing skills and analyze those using statistical and

epidemiological skills. Although the MOHMS encourages health committees in communities and settings to assess the needs of their own communities, CHNs also assessed needs and then discussed with community people. They considered minorities and vulnerable groups, tried to incorporate qualitative information from the community people and stakeholders into the analysis, evaluated both assets and problems. They identified health problems, social determinants of health, and target groups. They presented their analyses to resource people, especially health committees, and discussed solutions until a mutual consensus was met.

④ Plan community health activities with resource people aiming for behavioural change and empowerment

The CHNs tried to apply their knowledge gained from past experiences, workshops, CHN meetings, and advice from supervisors. They actively communicated with resource people and relevant organizations and collaboratively discussed how to set targets and objectives as well as planned activities. They prepared for activities together with head individuals of the village and community health workers, working to set up the best time that would avoid time conflicts. Rather than assuming leadership over activities, they tried to motivate and train resource people to take initiative for these activities instead.

⑤ Effectively implement, follow up, and evaluate activities

The CHNs knew that working with resource people in communities for scheduling was the best way to arrange activities. Presentation skills were needed to implement lecture style education sessions. Showing data pertaining to the target population was one way to motivate individuals toward behavioural change in these sessions. Although they collaborated with NGOs and other ministries besides the MOHMS, they also monitored and followed up on these cases. Monitoring, follow up, and evaluation are all challenging for many CHNs,

and many of our study participants noted this weakness. Confidence can be boosted among CHNs, however, when an evaluation of their activities identifies progress.

(3) Commitment toward work and community people

The CHNs often attempted to delegate certain responsibilities to community people, with the aim to strengthen their professionalism and promote teamwork. Commitment by CHNs was described in interviews as '*passion for work,*' '*being flexible,*' '*honesty,*' and '*being a role model as a leader of communities.*'

① Percieve responsibilities to community members

They tried their best to meet client needs with limited resources. They recognized that they had to address when an issue arisen. They worked to serve as role models for community people, tried to leave private issues at home, and maintained honesty in their reporting and record-keeping.

② Continue professional development

The CHNs were eager to learn from supervisors and colleagues, and try to apply what they had learned to their activities. They also tried to assess themselves to identify their weaknesses and limitations.

③ Promote teamwork

The CHNs actively kept an eye on their colleagues and supervisors to determine whether or not they could provide any assistance.

3) Components of community orientation: novice CHNs

The participants of the novice CHN group provided detailed descriptions of their thoughts and intentions as well as concrete examples on this theme. The extracted secondary codes of the novice CHNs were observed in all sub-categories of the expert CHN group. None of the secondary codes contradicted those of the

expert CHN group. The following are brief descriptions of the novice CHN group.

- (1) Mutually trusting relationships with community people aimed at empowerment

They paid careful attention in order to be accepted by people. They also tried to provide services in a responsible manner and sincere attitude, provided clinical care effectively to ill clients, and showed contribution to community people. They respected the local culture and tried to live in the same way as the community people do. They actively expressed their opinions and explained about nursing roles. They showed resolute attitude when requests from community people were beyond their task. They made effort to maintain relationships with stakeholders.

- (2) Collaborative activity management based on Plan-Do-Check-Act cycle

They tried to remind themselves that *'behaviour change is time-consuming work (N2-18)'*. They also recognised the importance of understanding various situations: *'Get several sources in order to understand concerning issues (N6-19), 'try to talk with individuals on both sides of an issue (N3-4)*. They struggled when people did not recognize the health needs that they had identified. They felt *'lucky'* if they were able to find any individuals who were willing to cooperate in community activities, and reported that it was difficult for them to motivate people to take roles in their activities: *'I just visited house to house when I didn't find any active people in the village (N1-28)'*. They also struggled to encourage community people to participate in community health activities: *'Some people are loose. Even if I knocked on their door and ask directly for their participation, they didn't always show up (N2-3)'*. Regarding the targets for these activities, one novice CHN commented: *'I do not have specific target groups for community health activities because I do not discriminate against anyone; anyone can come (N2-35)'*. However, one conclusion made by this novice CHN during the interview was *'maybe I need a smaller target group next time (N2-*

20).’ Regarding the work of CHNs, one novice nurse noted, *‘if I give up, then who else will help? (N3-5)’*. They did not comment much on their weaknesses. Two participants in the novice CHN group commented that they did not have any difficulties except procuring supplies and means of transportation.

(3) Commitment to work and community people

For this category, there were no peculiarities in codes generated by the novice CHNs relative to the expert CHN group. They recognized the importance of satisfying client needs with limited resources, exhibited the same perception of mission with regard to addressing issues within a community as they arose, and they tried to learn from their supervisors and colleagues, applying strategies employed by colleagues, workshops, and the media. They also commented on the importance of teamwork.

4) Components of community orientation: policy makers

None of the secondary codes from the policy maker group contradicted those of other groups. Policy makers also commented on attitude, saying *‘we (health professionals) should not look at ourselves as superior (P3-6)’*. They stressed the importance of community assessment as well: *‘Find out what makes people healthy (P2-16)’*, *identify assets (P1-15)’* and *social deterrents of health (P2-15)*. They defined planning as *‘supporting community people as they make plans,’* while the expert CHNs defined this as *‘discussing problems and planning with community members.’* They also commented that they would *‘not teach but empower (P1-10)’*. They noted the importance of targeting the population as a whole rather than individuals: *targets only small population, and focus on specific need for them. (P1-15)’*.

5) Components of community orientation: community representatives

Participants in the beneficiary group commented mainly on CHN attitudes toward community people. They acknowledged CHNs for frequent

communication and visits. With regard to the dissemination of information, they noted that *‘in addition to our giving them information, they (CHNs) also need to give us information so that we can think about what to do (B2-6).’* One unique code observed in this group was *‘our (community) problems are many jobless young people and teen-age pregnancy, but they are not the nurses’ problems’.*

Table 10 shows secondary codes combined from all groups.

Table10: Framework derived from interviews: Feature of CHNs who effectively collect information in communities and implement activities based on community health needs

Sub-Category	Secondly-Code			
	Nursing Manager/Supervisors/Lecturers (9)	Novice CHNs (5)	Policy Makers (3)	Beneficiaries (3)
Category1: Mutually Trusting Relationships with Community People Aimed at Empowerment				
1. Pay careful attention to be accepted by community people	1.Show respect to people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	2.Communicate in a approachable manner that is easy to talk for people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	3.Know how to approach to different kind of people.			
	4.Make an active effort to frequently and closely communicate to people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	5.Review own attitude toward people.	<input type="radio"/>		
	6.Have many experiences to communicate with people in various occasions.			
2.Be reliable and trustworthy for community people.	1.Provide services in a responsible and sincere attitude.	<input type="radio"/>	<input type="radio"/>	
	2.Make effort to fulfill promises and respond whenever necessary.	<input type="radio"/>		
	3.Show contribution and usefulness to people.	<input type="radio"/>		
	4.Protect privacy of people.			<input type="radio"/>
	5.Provide clinical care effectively to illness clients.	<input type="radio"/>		<input type="radio"/>
3.Show compassion and understand culture and lives of community people	1.Feel what people feel and express/share it.		<input type="radio"/>	
	2.Respect culture and try to live same way that people live in communities.	<input type="radio"/>		
	3.Consider things from people's positions/perceptive.			
4.Help people understand CHNs	1.Express nurses own to people.	<input type="radio"/>		
	2.Understand that people are curious about nurses.			
	3. Inform people what nursing role is	<input type="radio"/>		
5.Strengthen relationships with stakeholders to collaborate in activities	1. Create and maintain relationship with key people.	<input type="radio"/>	<input type="radio"/>	
	2. Actively inform about concerned issues to key people.			<input type="radio"/>
Category2:Collaborative Activity Management with Collaboration Based on Plan-Do-Check-Act cycle				
1.Aim at behavioral change and empowerment	1.Focus on not implementing activities but promoting and maintaining health and solving social problems.	<input type="radio"/>	<input type="radio"/>	
	2.Focus on not clinical services but promoting and maintaining health.		<input type="radio"/>	
	3.Be interested in promoting and maintaining health.	<input type="radio"/>	<input type="radio"/>	
	4.Target settings rather than individuals.		<input type="radio"/>	
2.Learn about community people and culture from and with community people.	1.Be interested in social activities in communities.	<input type="radio"/>		<input type="radio"/>
	2.Get support from people to collect information.	<input type="radio"/>		<input type="radio"/>
	3.Collect social, cultural, daily life information, and norm in communities.	<input type="radio"/>	<input type="radio"/>	
	4.Collect information on human resources and external organizations that nurses can work with.		<input type="radio"/>	
	5.Collect information that cause of health problems based on medical and nursing knowledge.		<input type="radio"/>	
	6.Pay careful attention to minorities and minorities.		<input type="radio"/>	
3.Implement needs assessment with community people.	1.Analyze collected information based on medical and nursing knowledge.	<input type="radio"/>	<input type="radio"/>	
	2.Study and analyze health problems and social determinants of health.	<input type="radio"/>	<input type="radio"/>	
	3.Consider health committees' analysis when analyzing health problems and causes.		<input type="radio"/>	
	4.Determine health problems, target groups, and social background affecting health problems.			
	5.Provide information and discuss with people about health needs in communities.		<input type="radio"/>	
	6.Be good at collecting and analyzing data.		<input type="radio"/>	
4.Plan activities with resource people aiming at behavioral changes and empowerment	1.Have a lot of idea and take initiatives in health promotion activities.			
	2.Discuss with people and other sectors/NGOs how to utilize assets and information into plan.	<input type="radio"/>	<input type="radio"/>	
	3.Discuss with people and other sectors/NGOs and set up objectives and a goal for community health activities.			
	4.Submit activity proposal to supervisors.			
	5.Motivate and train resource people toward healthy lives of whole communities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	6.Motivate target people toward healthy life styles and persuade to participate to activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.Implement, follow up, and evaluate activities.	1. Be good at organizing activities.	<input type="radio"/>		
	2.Take social events into account and schedule activities in advance.			
	3.Utilize clients' actual experiences and showing data of communities in health educations.		<input type="radio"/>	
	4.Have knowledge and skills on health education.	<input type="radio"/>		
	5.Have clinical knowledge to effectively provide health educations.			
	6.Participate community health activities as a participant	<input type="radio"/>		
	7.Collaborate with other sectors/NGOs.	<input type="radio"/>	<input type="radio"/>	
	8.Monitor and follow up until achieving a goal/objectives.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	9.Make continued effort to find a way even though no services are available in any GOs and NGOs.			
	10.Take responsibilities for monitoring progress of referred cases/activities.			
	11.Record and report activities, evaluate, and identify progress and lesson learnt.	<input type="radio"/>		

Table 10 (continued)

Category3: Commitment toward Work and Community People				
Sub-Category	Secondly-Code			
	DNM/SDHS/Lecturers (9)	Novice CHNs (5)	Policy Makers (3)	Beneficiaries (3)
1.Perceive responsibilities to community people	1.Try to satisfy clients' needs within limited resources.	○	○	
	2.Perceive sense of missions when finding problems in communities.	○	○	○
	3.Be role model as a leader of communities.			○
	4.Sacrifice if people urgently need			
	5.Not bring family issues to work place			○
	6.Be honest with recodes and reports.			
2.Continue professional development	1.Willing to learn from supervisors and colleague.	○		
	2.Apply strategies used by colleague, workshops, and media.	○		
	3.Analyze own limitation/weakness and empower own.			
3.Promote teamwork	1.Try to contribute to colleague.	○		

Community Rep: community representative

GOs: governmental organizations, NGOs: non-government organizations

8. Discussion

The central theme of Study 1 is characteristics of community orientation, i.e., competency of CHNs who effectively collect, disseminate, and respond to community health information. The study identified three categories that describe the main theme: (1) Mutually Trusting Relationships with Community People toward Empowerment (hereafter <Trusting Relationships>), (2) Collaborative Activity Management based on Plan-Do-Check-Act cycle (hereafter <Activity Management>), (3) Commitment toward Work and Community People (hereafter <Commitment>). These findings profoundly resonate with a study conducted by Yamashita, Miyaji, and Akimoto (2005), who identified that the roles of PHNs' included commitment to establish trust relationship, identifying the true needs of clients, and responding appropriately and promptly. Yamashita et al. (2005) stated that identifying needs and responding to people in a committed way yields a trusting relationship. Bent (1999) stated that caring, as a professional ethic, must be a social commitment to work with others in ways that are connected, engaged, and meaningful. These statements lead <Commitment> that aims to create a foundation for community orientation. Trust is an essential aspect of the relationship between clients and nurses (Mok and Chin, 2004). Established relationships facilitate an openness and willingness to ask and respond health needs (Zeidler, 2011). Therefore, <Trusting

Relationships> is regarded to serve as a prerequisite for <Activity Management>. With regard to the relationship between <Commitment> and <Trusting Relationships>, Yamashita et al. (2005) stated that commitment and trusting relationships are inter-related. Trusting relationships enable to bring out real information about life, including information on health problems that people face. By gaining a more comprehensive understanding the life styles lived by the community people, CHNs' commitment toward their tasks increased, motivating them further to protect and promote their healthy life styles. In this manner, <Commitment> and <Trusting Relationships> are inter-related and serve as foundation for community orientation. Conceptual framework on community orientation of CHNs Fiji is proposed in figure 3.

These findings are consistent with Proenca's community orientation framework (Figure 2) that identified two capacities necessary for community orientation (community sensing and community linking) as well as five factors that influenced those two capacities. The concept of community sensing is observed in Sub-category 2-2: Learn about community people/culture from/with community people and Sub-category 2-5: Implement, follow up, and evaluate activities. Notion of community linking is widely observed in <Trusting Relationships> and <Activity Management>. Four factors: Community involvement in environmental analysis, integration of internal information system, membership in integrated community care networks, and accountability are described in <Activity Management>. One factor: Powerful and trustworthy entity is characteristic described into <Trusting Relationships> and <Commitment>. This confirmed that the study covered the necessary elements for community orientation.

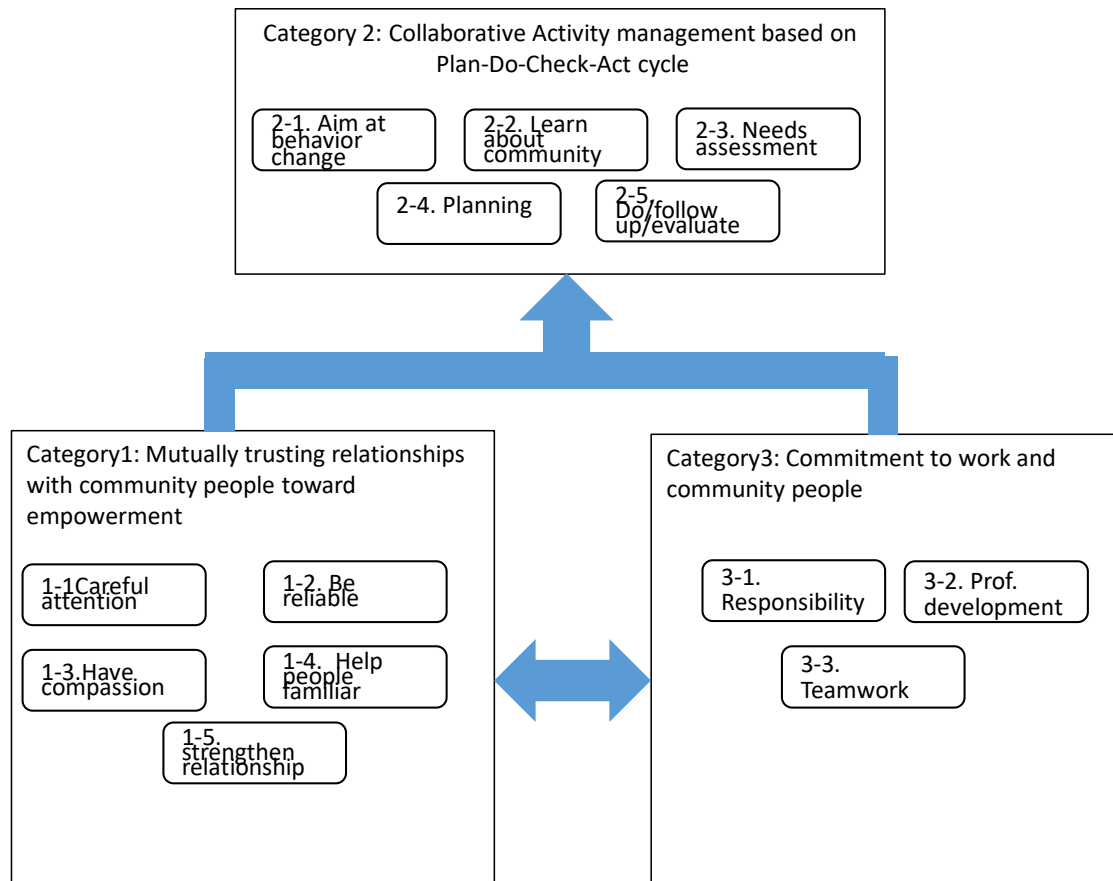


Figure 3: Conceptual framework on community orientation of community health nurses in Fiji

Category1: Mutually trusting relationships with community people toward empowerment

- 1-1. Pay careful attention to be accepted by people
- 1-2. Be reliable person to people
- 1-3. Show compassion to understand culture and people
- 1-4. Help people familiar with nurses own
- 1-5. Strengthen relationships with stakeholders

Category2: Collaborative activity management based on Plan-Do-Check-Act cycle

- 2-1. Aim at behavior change and empowerment
- 2-2. Learn about community people/culture from/with community people
- 2-3. Implement needs assessment with community people
- 2-4. Plan activities aiming at behavior changes
- 2-5. Implement, follow up, and evaluate activities

Category3: Commitment toward work and community people

- 3-1. Perceive responsibilities to community people
- 3-2. Continue professional development
- 3-3. Promote teamwork

The CHNs commit to their work and to community people. Commitment is a critical prerequisite to empower community people such that they might responsibly participate in activities. CHNs also need to possess responsible attitude toward activities, and show their commitment to active and willing participation in activities (Okada, Konishi, 2004). Their intentions and willingness to change is essential factor necessary for collaborative partnership in implementing community health activities (Gottlieb, Feeley, Dalton, 2006). Such a sense of responsibility further motivates CHNs to engage even more in their work and in the community people.

Building mutually trusting relationships with community people requires invisible and careful attention. A numbers of articles and textbooks stressed the importance of understanding one's target individuals when conducting community health activities (e.g. Hirano, 2011; Kanakawa, 2011; Markham and Carney, 2007). A community comprises pluralities of persons and interactional units (Schultz, 1987). Although CHNs focus on groups in communities as a unit, they also strengthen interpersonal relationships with individuals in communities. Successful participation implies negotiation without manipulation and equity in relationships between CHNs and community members (Leonard, 2015). It is essential that the attitude of a CHN is one of respect and willingness for collaborative work with individuals and families as they solve/cope and cope with community problems (Okada, Konishi, 2004). Collaboration requires CHN and individuals to be mutually open and respectful, show tolerance for another person's belief, and understand oneself, others, and situations from another person's perspective (Gottlieb and Feeley, Dalton, 2006). Such established relationships facilitate an openness and willingness to ask and respond on both sides (Zeidler, 2011), and continued efforts by CHNs to such relationships can yield partnerships with others that empower community as a whole.

Management of community health activity forms one pillar as <Activity Management> for forming the framework of community orientation for CHNs in

Fiji. The nursing process involves assessment, planning, implementation, and evaluation as part of a wider systematic decision-making process characterized by cognition, client-centeredness and goal direction (Clark M., Hahn P., 1996). Community people are not merely data source or targets for intervention. To influence change in community health requires active participation where power is shared among community people and CHNs throughout the Plan-Do-Check-Act process (Shuster, Goeppinger, 1996). Community development is consistent with PHC principles, wherein community people determine what health care services should be provided (Rifkin, 1986). Community assessment is necessary both for empowerment as well as for identifying community health needs. True empowerment in community can occur only when its members have the knowledge required to assess their situation and take action to make change happen (Hancock, Minkler, 2012). Thus, a shared awareness of community health needs is an essential part of the process of community health activities. With their participation, CHNs try to enable community people to make decisions and act on issues (Anderson and McFarlane, 2004). Mechanisms that can mobilize a community to develop a culture of participation are also essential for increasing community participation (Meleis, 1992). Nonofficial community leadership is less obvious and may be more difficult to detect; however, this leadership often exerts more influence, power, and control over community action and decision-making than official leaders (Clemen-Stone, Eigsti, McGuire, 1995). Based on the information about community resources and their relationships, CHNs find, motivate and train key people according to the specific health needs. This study confirmed the importance of experiencing these process in the context of community orientation.

Policy makers commented that CHNs should target specific populations while novice CHNs asserted that community health activities should not be limited but rather open to any community people. Rose (1985) stated that prevention strategies have two approaches: a high risk approach which seeks to protect susceptible individuals identified as having an elevated risk for some

adverse health outcomes, and population approach that targets the whole population and seeks to control the causes of incidences. Shimoda et .al. (2007) proposed that community approach would promote community health simultaneously with both population and high risk approaches, as the community approach does not target any particular health issues but instead promotes community initiatives with the aim to improve quality of life for community people or extend health life expectancy. The CHNs are able to benefit from combing those approaches, depending on the situation and aim. Such a strategic approach would increases effectiveness of <Activity Management>.

VI. Development of a scale to measure degree of community orientation among community health nurses in Fiji (Study 2)

1. Objective

Study 2 aimed to develop a scale to measure community orientation among Community Health Nurses in Fiji (COSCHN) by applying the conceptual framework developed in Study 1.

2. Methods

1) Period and Area

This survey was conducted from April to July 2016 in Fiji.

2) Sample population

Study 2 targeted all CHNs (sum of 269 obtained from nursing managers and supervisors) working at health centres and nursing stations in Fiji during the study period. As one questionnaire form did not make it to the one CHN working in the Rutuma sub-division, due to poor accessibility during the limited research period, Study 2 ultimately targeted 268 CHNs.

The necessary sample size for factor analysis varies among articles (e.g., Devellis, 2016; Wolf, Harrington, and Clark, 2013). Tinsley and Tinsley (1987) suggested a ratio of about 5 to 10 subjects per item, up to a total of about 300 subjects. In this study, sample size was set to 300 subjects. The CHN in Fiji is ~~relatively~~ small in population, and the collection rate was not expected to be optimal due to geographical challenges. Given this context, Study 2 also included former CHNs who had transferred within a year prior to the survey besides active CHNs.

A pilot test was implemented among 28 CHNs prior to a nation-wide survey. A re-test was implemented one month after the nation-wide survey in the central division to the 74 participants who agreed to participate and

submitted re-test entry forms. Details of pilot test and re-test were described in the later section.

3) Data collection methods

(1) Questionnaire construction

Data were collected from a self-administered questionnaire. The questionnaire consisted of the following four components:

- ① 51 items of the COSCHN (original version of COSCHN),
- ② 6 items from the academic version of the Three-Component Model Employee Survey Normative Commitment Scale (TCM-NCS, Meyer and Allen, 2004),
- ③ Items to test known-groups validity,
- ④ Items pertaining to influential factors and community orientation outcomes.

① Original version of the Community Orientation Scale for Community Health Nurses in Fiji (original version of COSCHN)

The original version of COSCHN was based on the following three categories in Study 1,

- a. Mutually Trusting Relationships with Community People Aimed for Empowerment, <Trusting Relationships>,
- b. Collaborative activity Management based on Plan-Do-Check-Act Cycle, <Activity Management>, and
- c. Commitment to Work and Community People, <Commitment>.

Items was developed referring sub-categories in Study 1 but were focused on self-concept, i.e., attitudes, values, and perceptions. Questionnaire items need to be meaningful, not offensive, not too mild and too extreme (DeVellis, 2016). With careful consideration of these points of caution, the sentences were modified repeatedly. Fifty-nine items were selected for measurement along a seven-point

Likert scale that would indicate the degree of implementation, whereby 1 is *not at all* and 7 is *extremely*. An odd number of response choices was applied because it allowed for equivocation (DeVellis, 2016). While a higher number reflected a higher level of community orientation, four items were reversed in this regard, in that a higher number reflected a lower level of community orientation.

Content validity was checked through a comprehensive review carried out by the eight experts: four medical and nursing managers (including a former manager) of the MOHMS, one senior nursing lecturer in the college of nursing, and three Japanese researchers who had worked in the health sector in Fiji. They evaluated whether the questionnaire items adequately assessed the targeted behaviors to be measured. Items were added, consolidated, and modified to reflect their comments.

② Academic version of the Three Component Model Employee Commitment Survey Normative Commitment Scale (TCM-NCS)

The Three Component Model Employee Commitment Survey measures three forms of employee commitment to an organization: desire-based for affective commitment, obligation-based for normative commitment, and cost-based for continuance commitment (Meyer and Allen, 2004). Normative commitment refers to commitment based on a sense of obligation to the organization, such that employees with strong normative commitment remain because they feel they ought to do so (Meyer and Allen, 2004). The normative commitment scale was chosen for concurrent validity because obligation was one of the main components in the community orientation framework developed in Study 1. The TCM-NCS consists of six items with a seven-point Likert scale for which 1 is *strongly disagree* and 7 is *strongly agree*. Permission to use the assessment tool was obtained from the authors' organization.

③ Items to test known-groups validity

Study 1 revealed that community orientation is influenced by working, supporting, and educational environments. A high degree of community orientation indicates effective collection and dissemination of, and response to community health needs. Therefore, CHNs with a high degree of community orientation actively and effectively implement community health activities. Such CHNs gain good reputations among supervisors. Therefore, known-groups validity was employed the following two items:

- a. Community health activities implementation,
- b. Self-reported supervisor competency evaluation.

Community health activities were measured by whether CHNs had implemented all activity management processes with community people past two years prior to the study period. Remarks were provided to discriminate community health activities in this study from daily routine services such as domiciliary case visits or outreach clinics in communities: *community health activities for this survey indicated that CHNs went through all processes including planning, implementing, and evaluating community health activities with community people and/or other organizations.*

The supervisor's competency evaluation was a self-report in which the item were measured on a 10-point scale where 1 is *very bad* and 10 is *excellent*.

④ Factors and outcomes related to community orientation

Details were described in the next chapter (Study 3).

(2) Data collection

① Pilot test

A pilot test was conducted prior to the nationwide survey. The questionnaire forms with envelopments were distributed to 29 CHNs in Suva sub-division, Central division. Permission was obtained from the head of the

department (divisional medical officer) through a written consent form prior to the distribution. All questionnaire forms were distributed by the researcher and orientation was provided at the time of distribution. Forms were collected later by either the researcher or their supervisors depending on their convenience. The researcher asked supervisors not to open any of the envelopes. All participants of the pilot test received USB drives as a token of gratitude.

The questionnaire was examined with regard to its clarity of explanation, response time, ceiling effects, floor effects, and questions with a low response rate. For some items, the explanations were modified and finalized.

② The survey

The questionnaire forms were distributed to each individual CHN. Participants of the central division also received retest entry forms. The researcher visited as many health centres and nursing stations as possible, and accompanied divisional nursing managers' field visits to the interior area and outer islands. The researcher also visited former CHNs when introduced by supervisors. Orientation and instruction was given at the time of distribution. For CHNs located at health centres and nursing stations where the researcher could not reach due to limited time and poor transportation, the forms were distributed and collected by nursing managers and supervisors who agreed in advance to do so. Participants of the survey received F\$6 (approximately US\$3.0) of mobile phone prepaid cards by submitting their forms, regardless of whether any values were missing. Nursing managers and supervisors who cooperated with the distribution and collection received F\$30 (approximately US\$15.0) of mobile phone cards.

③ Retest

The retest survey was conducted one month after CHNs submitted the questionnaire forms. The target was CHNs in the central division who submitted retest entry forms containing the date, their name, and working place. Retest

entry forms were enclosed in a separate envelope to ensure confidentiality. The retest followed the same procedure as the survey.

4) Data analysis methods

Any questionnaire that contained missing or duplicate values for any of the 51 items of COSCHN were eliminated from the analyses. Analyses were performed by SPSS Windows for 24.0 and Amos 24.0.

(1) Item analysis

Descriptive statistics analysis was conducted for each item to check the distributions, ceiling and floor effects, skewness, item-total correlation (I-T correlation), good-poor analysis (G-P analysis), and correlations between each item.

(2) Examination of reliability and validity

① Validity

a. Construct validity

Exploratory factor analysis was performed to assess construct validity. The exclusion point for factor loading was set to .4. Items with a factor loading that was just slightly lower than the exclusion point were re-considered and carefully examined. Next, confirmatory factor analysis was performed to assess the goodness-of-fit of the hypothesized high-order factor analysis model with the following indicators: χ^2 , goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative fit index (CFI), root mean residual (RMR), and root mean square error of approximation (RMSEA).

b. Concurrent validity

Concurrent validity was examined by Pearson's product-moment correlation coefficient (Pearson's correlation coefficient, r) between the TCM-

NCS, the COSCHN, and “Commitment”. “Commitment” in the COSCHN was selected for analysis because it indicated commitment.

c. Known-groups validity

Known-groups validity was examined by Welch’s t-test with regard to:

- (i) Implementation of community health activities past two years (implemented and not implemented), and
- (ii) Degree of supervisor’s competency evaluation (high and low divided by median value).

② Reliability

(1) Internal consistency

Internal consistencies were assessed by Cronbach’s α for COSCHN and four factors.

(2) Temporal stability

Temporal stability of the scale was examined by Pearson's correlation coefficients that compared the survey and the re-test.

3. Ethical considerations

The cover letter of the questionnaire and request letter to the directors stated the following ethical considerations:

- There are no disadvantages if one does not participate in this research.
- The questionnaire forms are filled out anonymously. Names and facilities are solicited only from the retest participants, in a separate form. Retest questionnaire forms are distributed to the participants with codes.
- Those who are not willing to participate in the research were to return blank questionnaires.
- Submission of written questionnaires is considered consent to participate in this research.

- The obtained data would be used only for research purposes.

Study 2 was approved by the Fiji National Health Research Ethics Committee (2016.6.NW) and the Aichi Prefectural University Research Ethics Committee (No.27APU-SIC6-32).

4. Results

1) Characteristics of the study population

Study 2 targeted 268 CHNs (zone and district nurses) in Fiji from all sub-divisions except for the Rutuma sub-division. As stated in an earlier chapter, zone nurses are assigned to zone areas and work in health centres with other health workers including CHN colleagues and allied health personnel such as physicians or nurse practitioners, nutritionists, and health inspectors. District nurses are assigned to district areas where people do not have easy access to health centres, and work alone in nursing stations. In total, 226 questionnaires were returned (response rate, 84.1%). The study also targeted former zone and district nurses who transferred to other positions within one year following the present study period. As stated earlier section in this chapter, this study targeted former CHNs to secure number of subjects. The researcher visited former CHNs if was introduced by their former supervisors. All former CHNs worked under same supervisors at the study period so that additional permissions were not necessary. Twenty-four questionnaires were distributed and collected. In total, 292 forms were distributed and 250 forms were collected. Twenty-four forms were excluded due to missing or duplicate values in the 51 items of the original version of COSCHN. Thus, 226 subjects were considered valid for analyses (77.4%).

The descriptive statistics of the study population are presented in Table 11. Of all the respondents, 130 (57.5%) reported working as zone nurses, 83 (33.2%) were district nurses, 11(4.9%) were former zone nurses, and 10 (4.4%) were former district nurses. Mean age was 31.0 years old (standard deviation: SD=5.7). The age group with the highest number of respondents was 25-29 years

old ($n=81$, 35.8%), followed by 30-34 years old ($n=77$, 34.1%), indicating that nearly 80% ($n=177$, 78.3%) of CHNs were reportedly 34 years old or younger. Populations covered by CHNs ranged in size from $<1,000$ to $\geq 11,000$ community members. The most common size was 1,000-2,999 ($n=69$, 30.5%), followed by 3,000-4,999 ($n=46$, 20.4%), and $< 1,000$ ($n=40$, 50.9%). Approximately 70% (156, 68.6%) of CHNs were assigned to communities with $<5,000$ members in the population. Mean amount of experience in the current position (or former position for former CHNs) was 3.25 years ($SD=3.3$). The most frequently reported amount was <3 years ($n=151$, 60.4%), followed by 3-4 years ($n=55$, 24.3%). More than 80% ($n=191$, 84.5%) worked ≤ 5 years. Mean amount of any experience working as a CHN was 4.4 years ($SD=4.4$), and that for any nursing experience (clinical and public health included) was 7.8 years ($SD = 5.2$). Almost all respondents ($n=225$, 99.6%) had obtained a diploma in nursing, 6 (2.7%) had obtained a bachelor's degree in nursing science, and 4(1.8%) had obtained a midwifery license.

Table 11: Descriptive statistics of the study population (n=226)

Items	Characteristics	No.	%
Position			
	Zone Nurse	130	57.5
	District Nurse	75	33.2
	Former Zone Nurse	11	4.9
	Former District Nurse	10	4.4
	No answer	0	0
Age (Mean \pm Standard Deviation)			30.96 \pm 5.72
	<25 years old	19	8.4
	25-29 years old	81	35.8
	30-34 years old	77	34.1
	35-39 years old	31	13.7
	40-44 years old	10	4.4
	45-49 years old	5	2.2
	50-54 years old	2	.9
	No answer	1	.4
Target population			
	<1000	40	17.7
	1,000-2,999	69	30.5
	3,000-4,999	46	20.4
	5,000-6,999	28	12.4
	7,000-8,999	24	10.6
	9,000-10,999	8	3.5
	$\geq 11,000$	5	2.2
	No answer	6	2.7
Years of experience as a current/former zone/district nurse (Mean \pm SD)		3.25 \pm 3.25	
	<3 years	136	60.2
	3-5 years	55	24.3
	6-8 years	17	7.5
	9-11 years	9	4.0
	≥ 12 years	3	1.3
	No answer	6	2.7
Total years of experience as a zone/district nurse (Mean \pm SD)		4.38 \pm 4.39	
	<3 years	113	50.0
	3-5 years	59	26.1
	6-8 years	18	8.0
	9-11 years	16	7.1
	≥ 12 years	12	5.3
	No answer	8	3.5
Total years of experience as a nurse (clinical and public health included) (mean \pm SD)		7.81 \pm 5.18	
	< 2 years	37	16.4
	3-5 years	64	28.3
	6-8 years	40	17.7
	9-11 years	41	18.1
	≥ 12 years	32	14.2
	No answer	12	5.3
Education and Licenses			
	Diploma/Registered nurse (RN)	225	99.6
	Bachelor of nursing science/RN	6	2.7
	Midwifery	4	1.8
	Other	33	14.6
	No answer	0	

SD: standard deviation

2) Development of a community orientation scale for community health nurses in Fiji

(1) Item Analysis

Item analysis for the 51 items in the original version of COSCHN were conducted to examine ~~response~~ distributions and the normality of the scores. All reversed items were analyzed after they were rescored to the anti-reversed points. Table 12 shows the results.

① Normality analysis

Skewness of each item was determined for the normality analysis with exclusion criteria of either above 1 or below -1. Seven items were discarded (Items 5, 11, 40, 44, 47, 48, and 51).

② Ceiling and floor effects

Ceiling effect was calculated by the sum of the mean and SD with exclusion criteria being any item scoring below the maximum score (7). Eight items were discarded (Items 11, 42, 44, 45, 47, 48, 49, and 51). Floor effect was also calculated by subtracting SD from the mean, with exclusion criteria being any item scoring below the minimum score (1). No item was discarded.

③ Item-Total Correlation analysis (I-T Correlation analysis)

The I-T Correlation analysis was carried out by Pearson's correlation coefficients to determine the correlation within items. Exclusion criteria was set to coefficient under .2. All reversed items (Items 18, 26, 30, and 32) with negative values were discarded.

Table 12: Item analysis (n=226)

Items	Mean	SD	Skewn ess	Floor effec t	Ceiling effect	I-T	G-T
1 I respect community people under any situations.	5.98	.879	-0.836	5.10	6.86	.480	.000
2 I listen to community people rather than talking.	5.11	1.070	0.028	4.04	6.18	.395	.000
3 When visiting communities, I try to communicate with as many people as possible besides original purposes such as domiciliary case visits.	5.50	1.262	-0.916	4.24	6.76	.456	.000
4 I review my own attitude to community people every day.	4.98	1.447	-0.548	3.53	6.42	.445	.000
5 When I do not have a certain answer to a question that I received, I check and get back to them with a right answer.	5.56	1.165	-1.060	4.40	6.73	.480	.000
6 Despite obstacles and limitations, I do my best to fulfil promises that I have made to the community people.	5.67	1.079	-0.754	4.60	6.75	.504	.000
7 I try to give useful information especially on a first meeting with community people.	5.76	1.027	-0.899	4.74	6.79	.514	.000
8 I actively try to contribute to social activities in communities.	4.38	1.435	-0.272	2.95	5.82	.418	.000
9 When people don't follow my advice, I try to understand their situations.	5.20	1.117	-0.603	4.09	6.32	.441	.000
10 I try to be conscious (sensitive) of people's feelings and emotions, and express them.	5.63	1.047	-0.650	4.59	6.68	.532	.000
11 I try to use local dialogue and words that community people understand.	6.09	.996	-1.305	5.10	7.09	.408	.000
12 I try to be conscious (find out) what people expect from me as a community health nurse.	5.64	1.119	-0.925	4.52	6.76	.539	.000
13 I try to express my views and comments to community people.	5.46	.989	-0.432	4.47	6.44	.542	.000
14 When I cannot do what people expect, I try to explain my roles and tasks as a community health nurse.	5.55	1.058	-0.583	4.49	6.61	.560	.000
15 I try to regularly contact resource people in order to get information and discuss about community health situations.	5.20	1.205	-0.629	4.00	6.41	.546	.000
16 When people contribute toward better health for community, I try to express appreciation to them.	5.90	.942	-0.929	4.96	6.85	.625	.000
17 I try to actively inform issues of concern to resource people.	5.41	1.105	-0.760	4.30	6.51	.638	.000
19 I keep in mind that it takes time for people to change behavior toward healthy life styles and I need continuously make effort.	5.71	1.003	-0.757	4.71	6.72	.655	.000
20 I try to ask/check with various sources about issues/health problems in communities.	5.18	1.173	-0.341	4.01	6.35	.712	.000
21 I collect information about how community people want to spend their lives in the future.	4.11	1.497	-0.287	2.61	5.61	.475	.000
22 I collect information about people's views and beliefs, and factors that affect their lives.	4.81	1.351	-0.402	3.46	6.16	.531	.000
23 I try to collect information and familiarize myself with other organizations and officers in/for communities.	5.05	1.283	-0.435	3.77	6.33	.593	.000
24 I try to find connection between social problems and health problems of communities.	5.33	1.135	-0.744	4.19	6.46	.604	.000
25 I pay attention to vulnerable people and minority groups when collecting and analyzing information.	5.36	1.088	-0.636	4.28	6.45	.678	.000
27 I try to explain my needs assessment to community people until they get consented (understood).	5.44	1.103	-0.714	4.34	6.54	.631	.000
28 I support health committees how to implement and monitor their plan in order for them to manage by themselves.	4.85	1.303	-0.541	3.55	6.16	.628	.000
29 Instead of my taking initiatives, I try to lead community people take initiatives for community health activities.	5.08	1.234	-0.482	3.85	6.31	.640	.000

Table 12 : Item analysis (continued, n=226)

Items	Mean	SD	Skewness	Floor effect	Ceiling effect	I-T	G-T
31 I try to discuss with resource people and set up goals for mutually understanding direction of community health activities.	4.86	1.199	-0.364	3.66	6.06	.647	.000
33 I try to find and train appropriate people to take roles in community health activities.	4.99	1.511	-0.678	3.48	6.50	.541	.000
34 I try to make community health activities attractive to people who are currently not interested in them.	4.94	1.397	-0.520	3.54	6.34	.596	.000
35 I try to participate in community health activities as a participant.	5.10	1.392	-0.674	3.71	6.49	.554	.000
36 I try to involve other health alliances and organizations to work together for community health activities.	5.14	1.301	-0.758	3.84	6.44	.567	.000
37 I continue to find a way to provide services although currently there are no systems in any organizations to support community people.	5.01	1.270	-0.485	3.74	6.28	.551	.000
38 I try to find out how community health activities change community people.	5.01	1.218	-0.523	3.79	6.23	.678	.000
39 I seek feedback from participants after community health activities.	5.06	1.344	-0.793	3.71	6.40	.577	.000
40 I try my best to provide better community health activities despite obstacles and limited resources.	5.67	1.123	-1.074	4.55	6.80	.615	.000
41 I try to take immediate action when recognizing issues in my area.	5.64	1.092	-0.852	4.55	6.73	.671	.000
42 I am aware that community people regard me as a nurse even during off-duty days.	6.30	.852	-1.220	5.45	7.15	.422	.000
43 I try to be a role model for community people.	6.13	.867	-0.870	5.26	7.00	.581	.000
44 I try not to bring family issues to the workplace.	6.09	1.314	-2.206	4.78	7.40	.372	.000
45 I always pay attention to whether other nurses need help.	6.12	.909	-0.920	5.21	7.03	.587	.000
46 I share new knowledge and experiences with colleagues.	6.08	.896	-0.981	5.18	6.98	.581	.000
47 I try to find role model nurses whom I learn and mimic from.	5.97	1.077	-1.512	4.89	7.05	.555	.000
48 I try to listen to supervisors and colleagues when they point out my weaknesses.	6.31	.817	-1.514	5.49	7.13	.547	.000
49 I try to apply new methods that I learned from media, colleagues, or workshops.	6.15	.878	-0.943	5.28	7.03	.559	.000
50 I am aware of my own strengths and weaknesses.	6.05	.930	-0.800	5.12	6.98	.479	.000
51 I actively seek comments from supervisors and colleagues about my community health activities.	5.88	1.125	-1.168	4.76	7.01	.537	.000
18R* With limited resources, I emphasize clinical services rather than health promotion activities.	3.45	1.376	0.479	2.08	4.83	-.246	.017
26R* Priorities of health committees and community people should be more regarded than those of community health nurses.	3.22	1.335	0.357	1.89	4.56	-.445	.000
30R* Community health nurses cannot legitimately deal with modifying aspect of community environment.	3.46	1.337	0.048	2.13	4.80	-.432	.000
32R* I targeted not specific groups but as many as possible for community health activities.	2.76	1.267	0.763	1.49	4.03	-.548	.000

R*: reversed item (calculated to un-reversed score)

Selection criteria: Skewness $>|\pm 1|$, Floor effect Mean-SD <1 , Ceiling effect Mean+SD >7 , I-T (Item-Total) Correlation (r) $<.2$, $p<.05$ (two-tailed) =excluded items

④ Good-Poor analysis (G-P Analysis)

G-P analysis was conducted by Welch's t-test, as follows: a. calculate the mean of the total score for the original version of COSCHN, b. determine the first and last quartiles, c. extract and group upper and lower quartiles, and d. calculate Welch's t-test between the above groups for each item. Any item with p -value (p) $>.05$ was eliminated. All p were below .001, so no items were discarded.

⑤ Commonality

Commonality of all items were higher than the elimination criteria ($<.16$).

⑥ Correlation

Correlation was assessed by calculating Pearson's correlation coefficients within items. Coefficients for all items were above the elimination criterion ($<.7$).

Thus, after discarding 14 items (Items 5, 11, 18, 26, 30, 32, 40, 42, 44, 45, 47, 48, 49, and 51) from the original version of COSCHN, the analysis targeted the remaining 37 items.

(2) Validity Analysis

① Construct validity

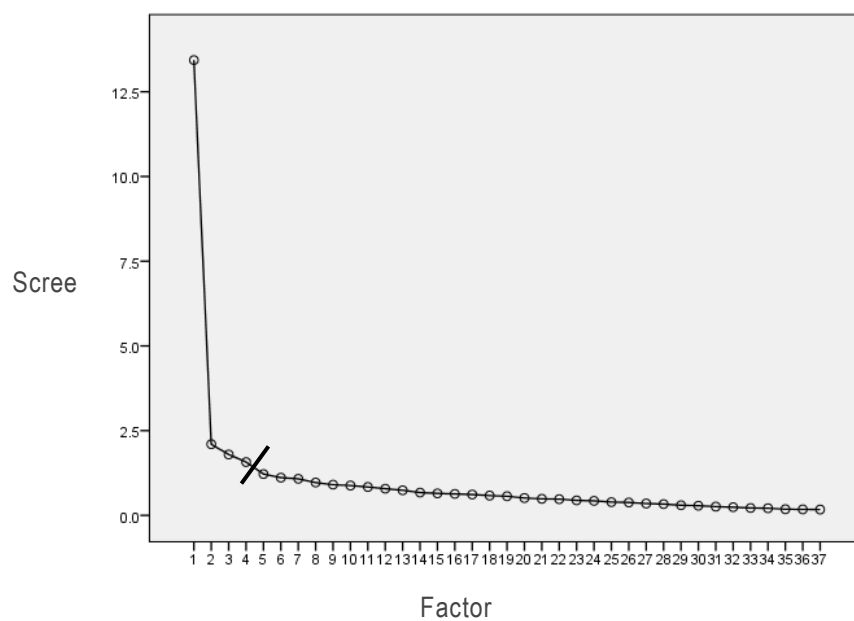
a. Exploratory factor analysis

To determine the underlying theoretical structure of the various factors, an initial exploratory factor analysis using the maximum likelihood method was carried out with 37 items. In consideration of the eigenvalue rule (DeVellis, 2016), the analysis showed seven factors exceeding the eigenvalue of one (Table 13). The scree plot showed an elbow drop between the fourth and fifth factors (Figure 4). Thus, further factor analysis was carried out with four factors. The factor contribution rate for these four factors was 51.03%. Commonality for all items was over .16.

Table 13 : Initial eigenvalue of exploratory factor analysis
(Maximum likelihood method/ no rotation, table showing only factors 1 through 8)

Factor	Total	Initial eigenvalue Variance %	Cumulative %
1	13.434	36.309	36.309
2	2.100	5.676	41.985
3	1.797	4.856	46.841
4	1.573	4.252	51.094
5	1.219	3.294	54.387
6	1.113	3.007	57.394
7	1.080	2.918	60.312
8	.968	2.616	62.928

Figure 4: Scree Plot of Factors



To extract items, Promax rotation was used based on the assumption that four factors were correlated with each other, and then the maximum likelihood technique was selected. Items with factor loading below .4 were deleted. The exploratory factor analysis with 37 items resulted in discarding of 7 items (Items 12, 13, 14, 16, 25, 27, and 29). The second factor analysis with 30 items (factor analysis 3) resulted in discarding 1 item (Item 8). The third factor analysis with 29 items resulted in all factor loading exceeding .4.

Before finalizing items, Item 25: I pay attention to vulnerable people and minority groups when collecting and analyzing information (hereafter, “Vulnerable People” was reconsidered because the factor loading was slightly below .4 (.399) in the first analysis. The fourth factor analysis was carried out

with “Vulnerable People” included. The analysis revealed that “Vulnerable People” scored .397 for factor loading, with all other items exceeding .4 (Table 14).

Table 14: Factor analysis: Community Orientation Scale for Community Health Nurses in Fiji
(4 factors, 30 items, total overall Cronbach α =.935)

Items	Factors			
	1	2	3	4
Factor 1 Cronbach α .861				
35 I try to participate in community health activities as a participant.	.711			
36 I try to involve other health alliances and organizations to work together for community health activities.	.700			
34 I try to make community health activities attractive to people who are currently not interested in them.	.613			
38 I try to find out how community health activities change community people.	.611			
33 I try to find and train appropriate people to take roles in community health activities.	.590			
39 I seek feedback from participants after community health activities.	.569			
37 I continue to find a way to provide services although currently there are no systems in any organizations to support community people.	.448			
Factor 2 Cronbach α .885				
23 I try to collect information and familiarize myself with other organizations and officers in/for communities.	.974			
21 I collect information about how community people want to spend their lives in the future.	.712			
22 I collect information about people's views and beliefs, and factors that affect their lives.	.703			
15 I try to regularly contact resource people in order to get information and discuss about community health situations.	.576			
17 I try to actively inform issues of concern to resource people.	.506			
24 I try to find connection between social problems and health problems of communities.	.499			
20 I try to ask/check with various sources about issues/health problems in communities.	.485			
31 I try to discuss with resource people and set up goals for mutually understanding direction of community health activities.	.479			
25 I pay attention to vulnerable people and minority groups when collecting and analyzing information.	.397			
Factor 3 Cronbach α .817				
43 I try to be a role model for community people.		.704		
46 I share new knowledge and experiences with colleagues.		.659		
50 I am aware of my own strengths and weaknesses.		.583		
41 I try to take immediate action when recognizing issues in my area.		.553		
6 Despite obstacles and limitations, I do my best to fulfil promises that I have made to the community people.		.523		
19 I keep in mind that it takes time for people to change behavior toward healthy life styles and I need continuously make effort.		.508		
7 I try to give useful information especially on a first meeting with community people.		.448		
Factor 4 Cronbach α .787				
10 I try to be conscious (sensitive) of people's feelings and emotions, and express them.			.649	
2 I listen to community people rather than talking.			.551	
1 I respect community people under any situations.			.537	
8 I actively try to contribute to social activities in communities.			.528	
4 I review my own attitude to community people every day.			.511	
9 When people don't follow my advice, I try to understand their situations.			.499	
3 When visiting communities, I try to communicate with as many people as possible besides original purposes such as domiciliary case visits.			.479	
Factor correlations				
1	-	.625	.553	.419
2		-	.641	.561
3			-	.486
4				-

b.. Naming of factors

All seven items in Factor 1 (Items 33-39) belonged to <Activity Management> of the community orientation conceptual framework determined by Study 1. <Activity Management> consisted of information collection, assessment, planning, activity preparation, implementation, and evaluation. The seven items in Factor 1 pertained to preparation, implementation, and evaluation of activities in <Activity Management>. Five items (Items 33, 34, 35, 36, and 37) reflected the efforts by CHNs to promote ownership among community people. Two items (Items 38 and 39) concern the perception that CHNs try to evaluate activities. Thus, Factor 1 was named Community Initiative Promotion, (hereafter, “Initiative Promotion”).

Of the nine items in Factor 2, two (Items 15 and 17) belonged to <Trusting Relationships>, while the remaining seven items (Items 20-25, and 31) belonged to <Activity Management>. As all nine items involve information collection and planning, Factor 2 was named Consensus Building for Community Needs and Activity Goal (hereafter, “Consensus Building”).

Of the seven items in Factor 3, four (Items 41, 43, 46, and 50) belonged to <Commitment>, two items (Items 6 and 7) belonged to <Trusting Relationships>, and one item (Item 19) belonged to <Activity Management>. As all items involved responsibilities toward tasks and community people. Factor 3 was named Commitment toward Work and Community People (hereafter, “Commitment”).

In Factor 4, all seven items (Items 1-4, 8-10) belonged to <Trusting Relationships>. Four items (Items 1-4) pertained to getting community people to become familiar with nurses, two items (Items 9 and 10) were to show empathy and try to understand situations, and the last item (Item 8) pertained to the presence of a CHN conveying reliability to the community members. As such, Factor 4 was named Mutually Trusting Relationships with Community People toward Empowerment (hereafter, “Trusting Relationships”).

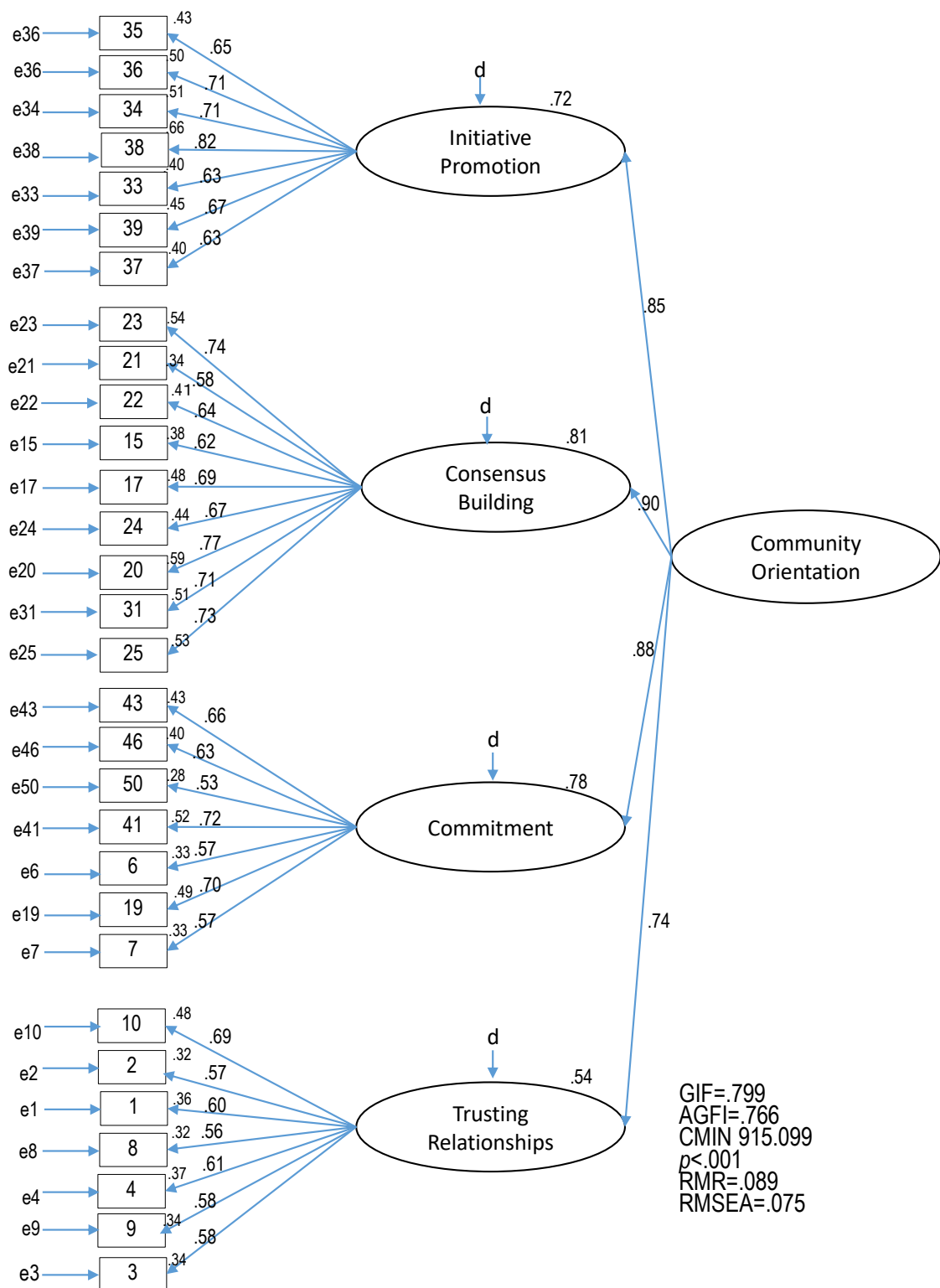
c. Confirmatory factor analysis

Confirmatory factor analysis for COSCHN was conducted by covariance structure analysis.

High-order factor modeling was set with four factors extracted in the exploratory factor analysis as latent variables and community orientation as a superordinate (high level) concept. Thirty items were substituted for observation variables (Model 1, Figure 5). Standardized estimates were used in the figures.

Path coefficients from the superordinate concept to the four factors ranged from .74 to .90, while those from the four factors to the observation variables ranged from .63 to .81 in “Initiative Promotion”, .58 to .74 in Consensus Building, .53 to .72 in Commitment, and .56 to .69 in Trusting Relationships. Significant differences were recognized in all 30 path coefficients below .1%. Multiple correlation coefficients (coefficients of determination) for the four factors were .72, .81, .78, and .54, respectively. Of the goodness-of-fit indicators, CMIN was 915.099 ($p < .001$), GFI was .799, AGFI was .767 exceeding GFI, and RMSEA was .075.

Figure 5: Confirmatory Factor Analysis : Model1 (30items)
Community Orientation Scale for Community Health Nurses in Fiji



Further analysis were conducted in order to obtain better goodness-of-fit indicators. Two modified high-order factor models were proposed. One model consisted of 29 items excluding “Vulnerable People”, for which the factor loading rate was .399 in the first exploratory factor analysis (Model 2, Figure 6). The other consisted of 30 items with shifted 2 items (Model 3, Figure 7), i.e. Item 7 was shifted from Factor 3 to Factor 4 because this item can also be interpreted as part of a strategic approach to build trusting relationships, and Item 37 was shifted from Factor 1 to Factor 3 because this item can also be a necessary component for a strong commitment to work. A comparison of goodness-of-fit indicators is presented in Table 15. Firstly, Model 1 was eliminated as showing the worst indicators. Model 2 showed the better GFI (exceeding .8) and AGFI but Model 1 showed the better RMR and RMSEA, however the differences were least substantial. This comparison revealed that there were not remarkable differences among three models.

Figure 6: Confirmatory Factor Analysis : Model2 (29items)
Community Orientation Scale for Community Health Nurses in Fiji

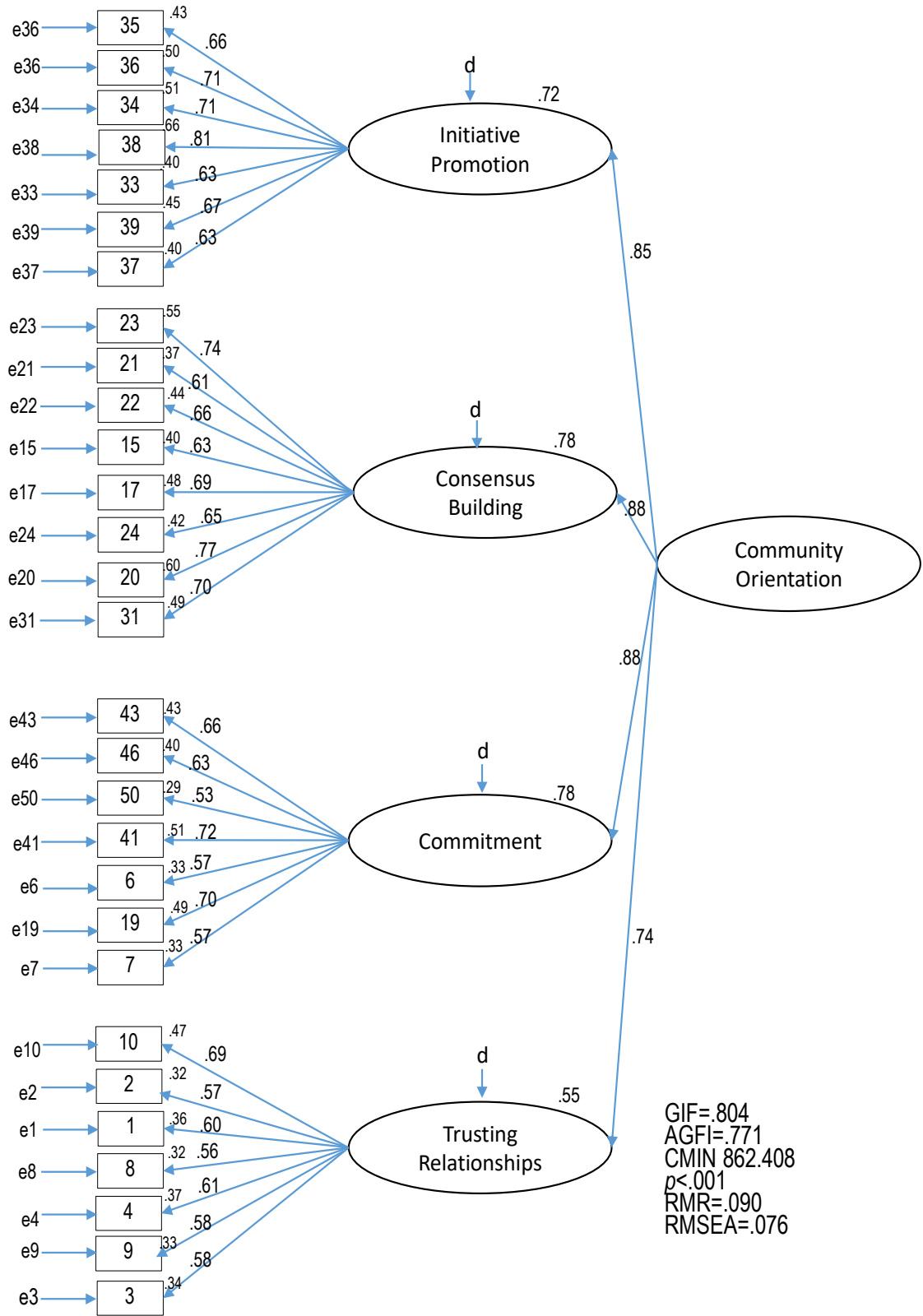


Figure 7: Confirmatory Factor Analysis : Model3 (30items)

Shifted 2 items: CO37 ("Initiative"→"Commitment"), CO7("Commitment"→"Trusting Relationships")

Community Orientation Scale for Community Health Nurses in Fiji

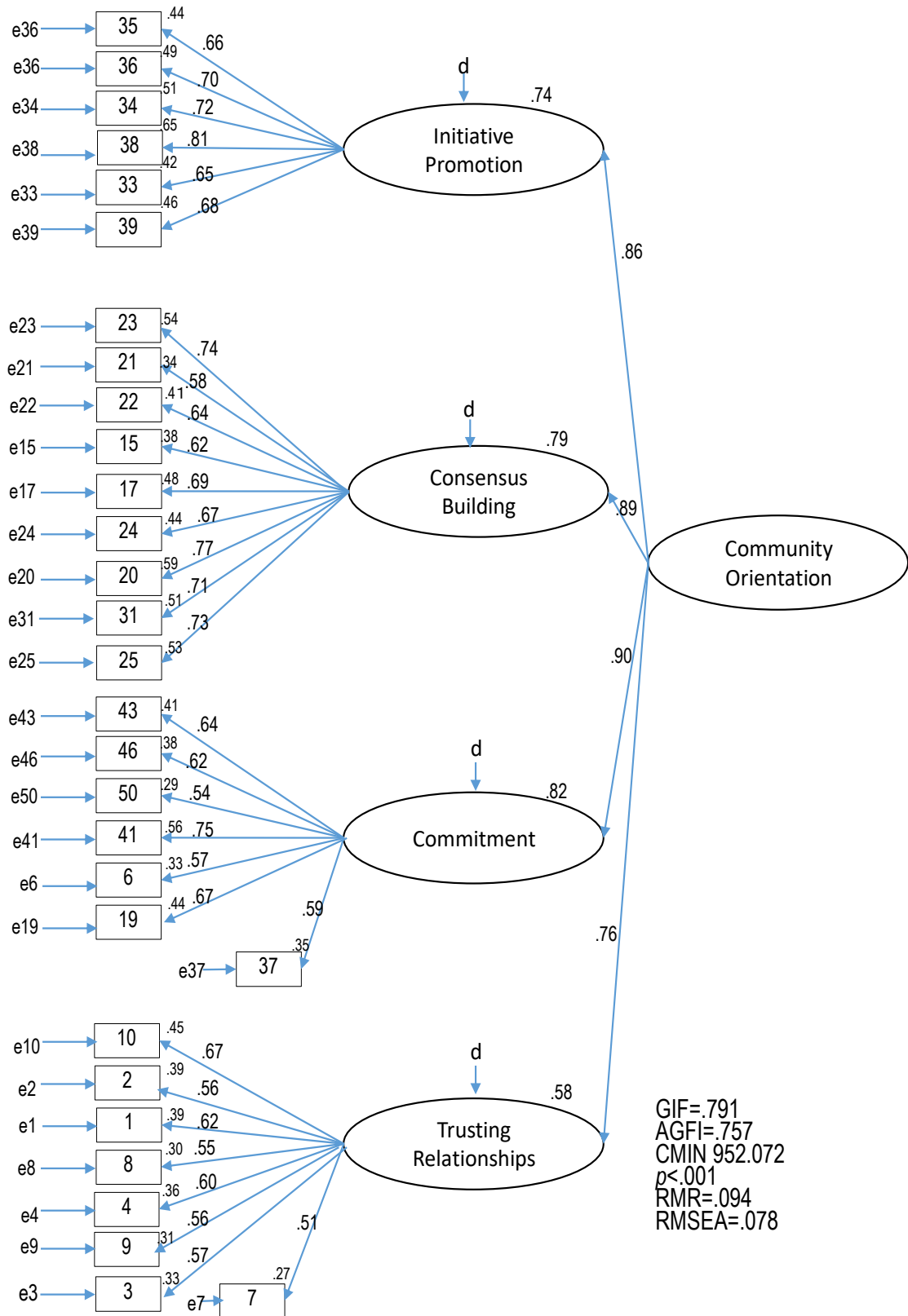


Table 15: Comparison of 3 models

Model No.	GFI	AGFI	X^2	RMR	RMSEA	Path Coefficients			
						CO→F1 F1→item	CO→F2 F2→item	CO→F3 F3→item	CO→F4 F4→item
1	.799	.766	$p<.001$	.089	.075	.85 .63 - .82	.90 .58 - .74	.88 .53 - .72	.74 .56 - .69
2	.804	.771	$p<.001$	.091	.076	.85 .63 - .81	.88 .63 - .77	.88 .53 - .72	.74 .56 - .69
3	.791	.757	$p<.001$	.094	.078	.86 .65-.81	.89 .58-.77	.90 .54 - .75	.76 .51 - .69

Model 1: COSCHN with 30 items

Model 2: COSCHN with 29 items excluding Item 25

Model 3: COSCHN with 30 items with Item 7 shifted from Factor 3 to 4 and Item 37 shifted from Factor 1 to 3

CO→F1: Path coefficient from community orientation to "Initiative Promotion"

CO→F2: Path coefficient from community orientation to "Consensus Building"

CO→F3: Path coefficient from community orientation to "Commitment"

CO→F4: Path coefficient from community orientation to "Trusting Relationships"

F1→item: Path coefficient from "Initiative Promotion" to items

F2→item: Path coefficient from "Consensus Building" to items

F3→item: Path coefficient from "Commitment" to items

F4→item: Path coefficient from "Trusting Relationship" to items

Confidence coefficients were calculated for Model 1 and 2 (Table 16). Comparison of the Kaiser-Meyer-Olkin (KMO) sample validity accuracy revealed that Model 2 showed a coefficient of .899, while Model 1 had a coefficient of .905, .006 higher than Model 2. Comparison of Cronbach's α for COSCHN revealed that Model 2 had α of .932, while Model 1 had α of .935, .003 higher than Model 2. Comparison of Cronbach's α for the model including factor that vulnerable people belonged revealed α of .873 for Model 2, and .885 for Model 1, .012 higher than that for Model 2. Comparison of cumulative contribution rates revealed a rate of 53.37% for Model 2 and 53.34% for Model 1, .03% lower than Model 2. All comparisons were nearly unchanged if not improved with the inclusion of "Vulnerable People".

The CHNs are unable to improve health situations without exercising principles of fairness and participation in decision-making (Brace, 2015). Gender inequality, poverty, and ethnicity issues are persisting in Fiji (Jones, 2013; Chatter, 2005), and the WHO recommends health professionals in Fiji to increase awareness surrounding gender norms and the inequality in perpetuating diseases (MOHMS, 2015). Equity is stated as a main value of the MOHMS (MOHMS, 2015). Thus,

“Vulnerable People” was considered indispensable for community orientation. Therefore, the analysis concluded that Model 1 should be used for COSCHN.

Table 16: Comparison of reliability for Model1 and Model 2

	Model 1 (30 items)	Model 2
KMO Sample validity accuracy	.905	.899
Cumulative contribution (%)	53.335	53.369
Cronbach α		
Whole scale	.935	.932
“Consensus Building”	.885 (Factor 2)	.873

KMO: Kaiser-Meyer-Olkin

② Concurrent validity

To test concurrent validity, Pearson's correlation coefficients were calculated for TCM-NCS and COSCHN, and TCM-NCS and Commitment. Commitment was applied because the items indicated commitment and obligation. The reversed items of the TCM-NCS was re-scored before analysis. Subjects with missing values in the TCM-NCS were discarded ($n=219$). Table 17 shows the result. Correlation coefficients were $r=.230$ ($p<.001$) between TCM-NCS and COSCHN, and $r=.263$ ($p<.001$) between TCM-NCS and “Commitment”.

Given the possibility that reversed items would be misinterpreted, additional calculations were made using five items of the TCM-NCS after discarding the reversed item. Correlation coefficients were slightly increased to $r=.295$ ($p<.001$) between TCM-NCS and COSCHN, and $r=.284$ ($p<.001$) between TCM-NCS and “Commitment”.

Table 17 : Analysis of concurrent validity ($n=219$)

	TCM-NCS (6 items)	TCM-NCS excluding reversed item (5 items)
COSCHN	.230**	.295**
Factor 3	.263**	.284**

** $p<.001$ (two-tailed)

Factor 3: Commitment toward Work and Community People

③ Known-groups validity

Welch's t-test was conducted to test the known-groups validity. Study subjects were divided into the two groups according to whether they had implemented community health activities past two years or not prior to the study period. Self-reported supervisor assessments were divided by a median value (8). Table 18 showed the result. Those who implemented community activities had higher COSCHN scores than those who did not, although the difference was not significant ($p=.069$, Table 18). Significantly higher scores for COSCHN ($p=.010$, Table 19) were observed in the group with higher scores for self-reported supervisor competency assessment.

Table 18: Known-groups validity by community health activity implementation in 2 years (Implemented, did not implement)

Items	Characteristics	Number	Mean \pm SD	<i>p</i> value
COSCHN	Implemented*	86	161.73 \pm 20.75	.069
	Did not implement**	86	155.66 \pm 22.68	

*Implemented community health activities past two years

**Did not implement community health activities past two years

Table 19: Known-groups validity by supervisor competency assessment

Items	Score	Number	Mean \pm SD	<i>p</i> value
COSCHN	1-7	87	153.33 \pm 21.18	.010*
	8-10	108	161.38 \pm 21.50	

* $p<.05$ (two-tailed), ** $p<.01$ (two-tailed)

(3) Reliability analysis

① Internal consistency

Cronbach's α values were calculated to test for internal consistency (Table 16). Cronbach's α for COSCHN and the four factors were .935, .861, .885, .817, and .787 respectively. None of the items increased the Cronbach's α when the item was deleted. Correlation coefficients were between .419 and .641.

② Stability

To analyze time stability, re-test was conducted one month after the test to 74 participants who had agreed to participate in the central division. Fifty-four questionnaires were collected, at a 73.0% response rate. After discarding eight forms due to missing values or duplicate responses, 46 valid forms were analyzed, at 62.2% valid response rate. Mean of COSCHN in the re-test exceeded that of the test, with a Pearson's correlation coefficient of .519 and significant ($p < .001$).

5. Discussion

1) Construct validity

In Study 2 developed Community Orientation Scale for Community Health Nurses in Fiji (COSCHN), and assessed the reliability and validity. The developed scale measures the degree of community orientation exhibited by CHNs in Fiji, i.e. beliefs, values, and perceptions toward generation, dissemination, and response of community health information that consists of four factors as follows: Community Initiative Promotion (“Initiative Promotion”), Consensus Building for Community Needs and Activity Goal (“Consensus Building”), Commitment toward Work and Community People (“Commitment”), and Mutually Trusting Relationships with Community People toward Empowerment (“Trusting Relationships”). Based on the conceptual framework of community orientation developed in Study 1, COSCHN was hypothesized consisting of three factors, but the exploratory factor analysis yielded four factors (Figure 4). This is primarily due to the division of <Activity Management> in Study 1 into two factors: one was information collection and planning, the other was preparation, implementation, and evaluation. This division is in line with the framework for community orientation proposed by Proenca (1998), who stated that community sensing and community linking as two distinct capacities for community orientation. Specifically community sensing is the ability to learn about community, which was relevant for “Consensus Building”. Meanwhile, community linking is the ability to create and manage close relationships, which

was more relevant to “Initiative Promotion”. “Commitment” in Study 2 consisted of one item in <Trusting Relationships> and two items in <Activity Management> besides four items in <Commitment> in Study 1, all of which indicate sense of responsibility and obligation to work and community people. All items in “Trusting Relationships” in Study 2 were extracted from <Trusting Relationships> in Study 1. Therefore, the factors in Study 2 is theoretically consistent with the categories in Study1.

The developed COSCHN was assessed by confirmatory factor analysis. Structural equation modeling is a powerful statistical technique that combines the measurement model or confirmatory factor analysis and structural model into a simultaneous statistical test (Hoe, 2008). A multiple correlation coefficient closer to 1.0 indicates a higher prediction accuracy. In addition, GFI and AGFI values that are closer to 1.0 indicate better interpretability. Data that indicate a higher AGFI than GFI with a minimum gap indicate a favorable outcome. A RMSEA <.5 indicates a good fit, while RMSEA > .1 indicates a poor fit (Oshio, 2012). Recommendations for RMSEA cut-off points have been reduced considerably in the last 15 years (Hooper, Coughlan, Mullen, 2008), such that value between .05 and .08 indicate a reasonably fit (Hoe, 2008). In the confirmatory factor analysis of Study 2, high-order modeling was set. CMIN in the path diagram of COSCHN <.001 indicating that the data were not suitably fitted to the model. However, multiple correlation coefficients of the four lower factors ranged from .81 to .54 in Model 1 which was interpreted as acceptable. Significant differences were observed for all 30 path coefficients at a level of .1%, and the model showed a higher AGFI (.766) than GFI (.799) with both values at nearly .8. The RMSEA of .075 was interpreted as a reasonable fit. Therefore, construct validity was thereby confirmed.

Considering the exploratory factor analysis and confirmatory factor analysis, structure of COSCHN is reasonably fit with framework in the study 1. Thus, construct validity was confirmed.

2) Criterion-related validity

Concurrent validity was tested by TCM-NCS, an external scale that measures obligation commitment toward work. The TCM-NCS was chosen because commitment is one of main component in COSCHN. “Commitment” was compared with the TCM-NCS besides COSCHN. Pearson product-moment correlation coefficient for the TCM-NCS and COSCHN, and the TCM-NCS and “Commitment” showed weak correlations with significant relationships ($r=.230$ for COSCHN, $r=.263$ for “Commitment”, with both $p<.01$). Given the possibility for misinterpretation of reversed item in the TCM-NCS, an additional analysis of concurrent validity was carried out by discarding the reversed item from the TCM-NCS. The result showed Pearson's correlation coefficients slightly increased ($r=.284$ for COSCHN, $.295$ for “Commitment”, with both $p<.01$). Therefore, criterion-related validity is confirmed by taking the discarded of revised items in the TCM-NCS. The TCM-NCS measures commitment to organizations, while “Commitment” indicates that exhibited to community people and activities. As such, the two scales did not measure completely same parameter resulting in weak correlations.

Known group validity was tested by community health activities and self-reporting supervisors' competency assessments. The CHNs with higher supervisors' assessment had significantly higher COSCHN than those with lower supervisors' assessment. Therefore, know-groups validity was confirmed to be reasonable.

3) Reliability

Item analysis was implemented to assess ceiling and floor effects, skewness, I-T effect and G-P analysis. Items with low internal consistency were deleted prior to the factor analysis. Commonality was also checked and confirmed that all items were $>.16$. Internal consistency was tested by Cronbach's α . The analysis showed α of $.935$ for COSCHN, and between $.787$ and $.885$ for the four

factors. A Cronbach's α exceeding .7 indicates a high reliability (Oshio, 2004). Therefore, the internal reliability was confirmed.

Time stability was tested among 46 subjects. The necessary sample size was found to be 29 for a correlation coefficient of .5, an α level of .05 (two-tailed), and a β level of .2 (Hulley, Cumming, Browner, Grady, Newman, 2007/Kihara Masako, Kimata Masahiro 2009). Thus, the analysis was conducted with a sufficient sample population. The correlation coefficient of .59 for COSCHN with a $p < .001$ indicated that time stability was confirmed.

All reversed items in the original version of COSCHN were discarded due to negative I-T correlation. Reversed items were set by referring to previous research articles, most of which were implemented in the US. The wording used in these studies was unsuitable for Fiji and would cause misinterpretation. It was therefore deemed necessary that wording was the simpler and easier to understand.

4) Significance of the community orientation scale for community health nurses in Fiji

The COSCHN is the first scale that focus on self-concept on community health activities of community health nurses. Competency Standard for CHNs in Fiji, well utilized into practice, contents 15 domains that describes all requirement works of CHNs including both treatment and health promotion work. The domains are described by 40 standards that are underlying characteristics i.e. skill and knowledge, self-concept, and trait and motion. The criteria of the standards are necessary action for 15 domains, which are used for self-assessment and supervisors evaluation. On the other hand, COSCHN focuses only on self-concept in competency that was invisible and influences to performance. Unlike skill and knowledge, CHNs developed self-concept through experiences. Such experiences were hardly impart to junior CHNs. The COSCHN will contribute to CHNs to effectively learn superior perceptions for community health activities.

I. Influencing factors and outcomes of community orientation (Study 3)

1. Objective

Study 3 aimed to explore influencing factors and outcomes of community orientation using the Community Orientation Scale for Community Health Nurses in Fiji (COSCHN).

2. Methods

1) Sample population

Study 3 utilized data obtained from Study 2, which targeted 268 CHNs.

2) Data collection methods

The present study data collection was synchronized with that of Study 2. The data collection procedure was described in “VI. Development of a scale to measure degree of community orientation among community health nurses in Fiji (Study 2)”.

3) Analysis framework

Figure 8 shows an analysis framework for Study 3. The items pertaining to influencing factors and outcomes for community orientation were developed according to previous studies in the literature. Guo et al. (2008) and Cross et al. (2004) identified factors that influenced the competency of PHNs: age, number of years worked, position, health center location, education level, implemented task frequency, and workshop participation (Table 6). Proenca (1998) identified antecedents and consequences of community orientation in health service organizations (Figure 2). The antecedents were (1) employee and community involvement in environmental analyses, (2) integration of internal information systems with the community health information network, (3) coordination of activities by a powerful and trustworthy entity, (4) membership in an integrated community care network with high connectivity and low centrality, complexity,

and differentiation, and (5) a community health-based reward system and culture that emphasizes community accountability. The three consequences were (1) cost-effectiveness, (2) market share, and (3) stakeholder satisfaction. The five antecedents share characteristics with items in the COSCHN. These three consequences, therefore, can be applied to measure outcomes of community orientation for CHNs in Fiji. Notably, the above outcomes cannot be applied to the individuals to be measured. Instead of cost-effectiveness, work effectiveness was measured by data management and documentation. Therefore, influencing factors and outcomes for community orientation consisted of the following:

Age and work experience: age, positions, years of work experience

Working environment: population size, number of CHNs in the workplace, accessibility to supervisor, office support for field visits

Educational environment: number of workshops attended, educational achievements

Outcomes: quarterly report-making, analysis sheet utilization, assessment of achievements through an annual sub-divisional plan (hereafter, SD plan comparison), and annual planning

Accessibility to supervisor was measured along a five-point Likert scale for which 1 was *difficult* and 5 was *easy*. Likewise, support for field visits was also measured along a five-point Likert scale for which 1 was *not supportive* and 5 was *supportive*. The quarterly report is a formatted activity achievement report that CHNs are required to submit to their supervisors who monitor the report closely. Analysis sheets, SD plan comparisons, and annual planning are all voluntary. An analysis sheet, called data summary, is an overview spreadsheet for transcribing data from quarterly reports to analyze situations. Submission of an analysis sheet is not required, but they are displayed on the wall in workplaces. An annual plan is not formatted, but most CHNs follow the content in their sub-divisional annual plans. CHNs are encouraged to compare their accomplishments in their sub-divisional plan as they develop plans for the next year. The degree to which each outcome item was practiced was measured along

a five-point Likert scale for which 1 is *not at all*, and 5 is *completely*.

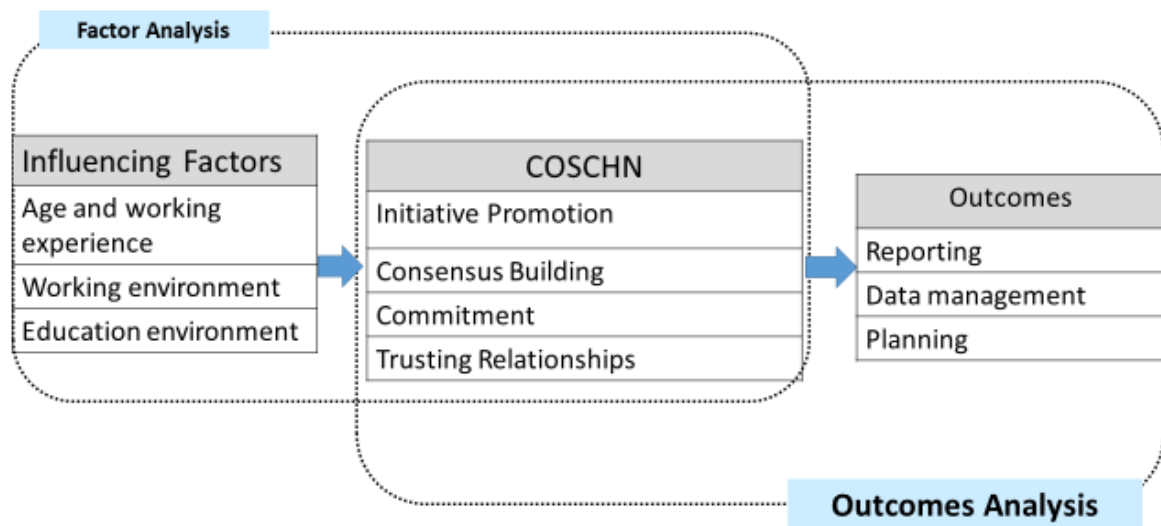


Figure 8: Analysis Structure of Study VII

4) Data analysis methods

Descriptive analysis was conducted and the distribution of each variable was checked by histogram. Next, bivariate analyses were conducted, using influencing factors as independent variables and scores of COSCHN and its four factors as dependent variables. Each influencing factor was divided by the median value or reasonable divisions. The statistical significance of differences in mean values between two groups was assessed by Welch's t-test for normal distributions regardless of variance equalities, and by Mann-Whitney's U-test for non-normal distributions.

Multivariate analysis was conducted by multiple regression analysis, using items shown to differ significantly in the bivariate analysis as independent variables and scores of COSCHN and its four factors as dependent variables. A trend analysis was also conducted for classified factors that showed trends in scores of COSCHN and its four factors.

The relationship between outcomes and scores of COSCHN and its four factors was assessed using the same procedures that were used for the influencing factor analysis. Analyses were performed by SPSS Windows for 24.0.

3. Results

1) Characteristics of the study population

Of 250 subjects, 81 were excluded due to missing or duplicate values for any of the 30 items in the COSCHN and items comprising influencing factors and outcomes. As a result, 169 subjects were considered eligible for analysis, with a valid response rate of 62.8%.

Characteristics of the study subjects are presented in Table 20. Of all respondents, 101 (59.8%) worked as zone nurses, 52 (30.8%) as district nurses, 9 (5.3%) as former zone nurses, and 7 (4.1%) as former district nurses. Mean age was 30.6 years (SD=5.4). Most subjects fell into the age group of 25-29 years (64, 37.9%), followed by those 30-34 years ($n=56$, 33.1%), revealing that nearly 80% ($n=135$, 79.9%) of subjects were reportedly younger than 34 years old. Populations covered by subjects ranged in size from $<1,000$ to $\geq 11,000$. The most common size was 1,000-2,999 ($n=52$, 30.8%), followed by $<1,000$ ($n=32$, 18.9%) and 3,000-4,999 ($n=31$, 18.3%). Approximately 50% ($n=84$, 49.7%) of subjects covered populations $<3,000$. Mean number of years of experience in their current position (former positions for former nurses) was 2.9 (SD=3.0). The most common amount of experience was 1-2 years ($n=77$, 45.6%), followed by 3-4 years ($n=31$, 18.8%) and <1 year ($n=31$, 18.8%). Approximately 60% of respondents (108, 63.9%) reported <3 years of experience at their current (former) position. Mean number year as a zone and district nurse was 4.0 years (SD=4.0), that for a clinical nurse was 3.5 years (SD=3.0), and that for total amount of experience in nursing was 7.5 years (SD=4.8). All subjects, 169 (100%) had obtained a diploma in nursing, 3 (1.8%) had obtained a bachelor's degree in nursing science, 2 (1.2%) had midwifery licenses, and 22 (13.0%) reported other licenses. Mean number of workshops attended past two years was 4.9 (SD=4.7). Most subjects reported attending 1-3 ($n=58$, 34.3%). Thirty-one (18.3%) subjects reported attending 10 or more workshops.

Mean number of CHN colleagues in workplaces was 3.1 (SD=3.8). The most common was no colleagues ($n=57$, 33.8%), followed by 1-3 ($n=54$, 32.0%).

Accessibility to supervisor measured along a five-point Likert scale revealed *easy* in the most common response ($n=122$, 72.2%), followed by *somewhat easy* (30, 17.8%), and *neutral* ($n=3$, 8.9%). Office support of field visits measured along a five-point Likert scale revealed *supportive* ($n=78$, 46.2%) in the most common response, followed by *neutral* ($n=51$, 30.2%), with *not supportive* and *somewhat not supportive* comprising very few ($n=3$, 1.8% and 13, 7.7%, respectively).

Table 20: Characteristics of study population: influencing factors ($n=169$)

Items	Characteristics	Number	%
Designated Division	Central Division	63	37.28
	Western Division	53	31.36
	Northern Division	28	16.57
	Eastern Division	25	14.79
Position	Zone Nurse	101	59.76
	District Nurse	52	30.77
	Former Zone Nurse	9	5.33
	Former District Nurse	7	4.14
Age	Mean \pm SD, (median) 30.59 \pm 5.36(30)		
	20-24 years old	15	8.88
	25-29 years old	64	37.87
	30-34 years old	56	33.14
	35-39 years old	23	13.61
	40-44 years old	8	4.73
	45-49 years old	2	1.18
	50-54 years old	1	.59
Target population	Mean \pm SD, (median) 2.91 \pm 1.57(3)		
	<1,000(1)	32	18.9
	1,000-2,999(2)	52	30.8
	3,000-4,999(3)	31	18.3
	5,000-6,999(4)	24	14.2
	7,000-8,999(5)	19	11.2
	9,000-10,999(6)	6	3.6
	$\geq 11,000$ (7)	5	3.0
Years of experience as current/former zone/district nurse	Mean \pm SD, (median) 2.85 \pm 2.95(2)		
	<1 year	31	18.34
	1-2 years	77	45.56
	3-4 years	31	18.34
	5-6 years	19	11.24
	7-8 years	3	1.78
	9-10 years	4	2.37
	≥ 11 years	4	2.37

SD: Standard Deviation

Table 20 (continued) $n=169$

Items	Characteristics	Number	%
Total year of experience as zone or district nurse, Mean \pm SD, (median) 3.99 \pm 3.98(2.42)			
	<1 year	25	14.79
	1-2 years	63	37.28
	3-4 years	31	18.34
	5-6 years	22	13.02
	7-8 years	7	4.14
	9-10 years	11	6.51
	≥ 11 years	10	5.92
Year of clinical experience, Mean \pm SD, (median) 3.50 \pm 3.04(2.58)			
	< 1year	11	6.51
	1-2 years	80	47.34
	3-4 years	39	23.08
	5-6 years	21	12.43
	7-8 years	8	4.73
	9-10 years	3	1.78
	≥ 11 years	7	4.14
Year of total nursing experience Mean \pm SD, (median) 7.51 \pm 4.77(6.17)			
	<1year	15	8.88
	1-2 years	77	45.56
	3-4 years	38	22.49
	5-6 years	21	12.43
	7-8 years	8	4.73
	9-10 years	3	1.78
	≥ 11 years	7	4.14
Education and licenses			
	Diploma/Registered nurse (RN)	169	100
	Bachelor of nursing science/RN	3	1.78
	Midwifery	2	1.18
	Others	22	13.02
Workshop attendance Mean \pm SD, (median) 4.91 \pm 4.69(4)			
	0 times	21	12.43
	1-3 times	58	34.32
	4-6 times	46	27.22
	7-9 times	13	7.69
	≥ 10 times	31	18.34
Number of CHN colleagues in workplace Mean \pm SD, (median) 3.07 \pm 3.75(2.00)			
	None	57	33.73
	1-3 nurses	54	31.95
	4-6 nurses	29	17.16
	7-9 nurses	17	10.06
	≥ 10 nurses	12	7.10
Accessibility to supervisor Mean \pm SD, (median) 4.61 \pm .70(5)			
	Difficult (1)	0	0
	Somewhat difficult (2)	2	1.18
	Neutral (3)	15	8.88
	Somewhat easy (4)	30	17.75
	Easy (5)	122	72.19
Office support for field visits Mean \pm SD, (median) 3.95 \pm 1.11(4)			
	Not supportive (1)	3	1.78
	Somewhat not supportive (2)	13	7.69
	Neutral (3)	51	30.18
	Somewhat supportive (4)	24	14.20
	Supportive (5)	78	46.15

Distribution of outcome variables is presented in Table 21. All outcome items were measured along five-point Likert scales. Mean rate of completion of quarterly reporting was 4.5 (SD=.9). The most common response was *completely* ($n=109$, 64.7%), followed by *very well* ($n=43$, 25.4%), meaning that approximately 90% ($n=152$) rated either *completely* or *very well*. Mean rate of utilization of the analysis sheet was 3.8 (SD=1.4). The most common response was *completely* ($n=73$, 43.2%), followed by *very well* ($n=39$, 23.1%) meaning that approximately two-thirds ($n=112$) rated their utilization as either *completely* or *very well*. Mean degree of sub-divisional plan comparison was 3.2 (SD=1.3). The most common response was *neutral* ($n=54$, 32.0%), followed by *very well* ($n=38$, 22.5%), and then *completely* (31, 18.3%). Mean implementation rate of annual planning was 2.9 (SD=1.4), which was the lowest mean of all outcome items. The most common response was *neutral* ($n=48$, 28.4%), followed by *not at all* ($n=42$, 24.9%), and *very well* ($n=31$, 18.3%).

Table 21: Outcome variables ($n=169$)

Item	Characteristic	n	%
Quarterly report completion	Mean±SD (Median) 4.48±.88 (5)		
	I did not do at all	5	3.0
	I did very little	1	0.6
	Neutral	11	6.5
	I did very well	43	25.4
	I did completely	109	64.5
Analysis sheet utilization	Mean±SD (Median) 3.74±1.44 (4)		
	I did not do at all	24	14.2
	I did very little	12	7.1
	Neutral	21	12.4
	I did very well	39	23.1
	I did completely	73	43.2
Sub-divisional plan comparison	Mean±SD (Median) 3.17±1.29 (3)		
	I did not do at all	26	15.4
	I did very little	20	11.8
	Neutral	54	32.0
	I did very well	38	22.5
	I did completely	31	18.3
Annual plan	Mean±SD (Median) 2.85±1.38 (3)		
	I did not do at all	42	24.9
	I did very little	23	13.6
	Neutral	48	28.4
	I did very well	31	18.3
	I did completely	25	14.8

2) Scores of Community Orientation Scale for Community Health Nurses in Fiji (COSCHN)

Scores of COSCHN and its four factors for 169 respondents are presented in Table 22. The COSCHN consisted of 30 items with possible total scores ranging from 30 to 210. A higher score reflected a higher degree of community orientation. The mean total score was 158.3 (SD=21.74), with a mean score per item of 5.28 and a median of 159. “Initiative Promotion” consisted of nine items with possible scores ranging from 7 to 49, with a mean score of 34.97 (SD=7.4), and a mean score per item of 5.00, which was the lowest mean value of the four factors. “Consensus Building” consisted of nine items with possible scores ranging from 9 to 63. The mean score was 45.2 (SD=8.4) and the mean score per item was 5.02, which was the second lowest mean value of the four factors. “Commitment” consisted of seven items, with possible scores ranging from 7 to 49. The mean score was 41.3 (SD=7.4), with a mean score per item of 5.90, which was the highest mean value of the four factors. “Trusting Relationships” consisted of seven items, with possible scores ranging from 7 to 49. The mean score was 36.9 (SD=5.5), with a mean score per item of 5.26, which was the second highest mean value of the four factors.

Table 22: Descriptive statistics of COSCHN and its factors ($n=169$)

	Factor 1	Factor 2	Factor 3	Factor 4	COSCHN
Number of items	7	9	7	7	30
Score range	7-49	9-63	7-49	7-49	30-210
Mean	34.97	45.22	41.27	36.85	158.31
Mean/item	5.00	5.02	5.90	5.26	5.28
Median	36.00	46.00	41.00	38.00	159.00
Standard deviation	7.44	8.36	4.81	5.49	21.74
Skewness	-.53	-.22	-.55	-.40	-.13
Sharpness	-.01	-.52	.28	-.03	-.51
Minimum value	15	24	27	20	112
Maximum value	49	63	50	49	209

Factor 1: Community Initiative Promotion

Factor 2: Consensus Building for Community Needs and Activity Goal

Factor 3: Commitment to Work and Community People

Factor 4: Mutually Trusting Relationship with Community People toward Empowerment

3) Analysis of factors influencing community orientation

Based on the analysis framework (Figure 8), influencing factors: (1) age and work experience, (2) working environment, and (3) educational background were analyzed as followed.

(1) Age and work experience

The influence of age and experiences on community orientation was examined. Welch's t-test was conducted to analyze the relationships between age and work experiences and scores of COSCHN and its four factors. The subjects were divided by an age cut-off of 30 years (the median). Working experiences were also divided by two years as a split point, applying Benner's transition framework (2001), i.e. t two to three years represents the transformation period from novice to competent nurses. Table 23 showed the result. The CHNs aged ≤ 30 years had significantly lower scores for "Commitment" than CHNs aged ≥ 31 years ($p=.027$). District nurses had significantly higher scores for "Trusting Relationships" than zone nurses ($p=.003$). The CHNs who worked more than two years as CHNs in a different area had significantly higher scores for "Trusting Relationships" than those who worked less than 2 years ($p=.007$). Bivariate analysis of current position, clinical experiences variables did not show significant differences in any scores of COSCHN and all four factors.

Table 23: Influencing factors of COSCHN: Age and working experience

Items and characteristics	n	%	Factor1		Factor2		Factor3		Factor4		COSCHN	
			mean	p value	mean	p value	mean	p value	mean	p value	mean	p value
age ^a												
<31	80	47.34	34.36	.261	44.02	0.05	40.51	.027	36.34	.202	155.22	.051
≥31	89	52.66	35.65		46.55		42.13	*	37.43		161.75	
Position ^a												
Zone/former zone	110	65.09	34.63	.406	44.81	0.37	40.95	.173	35.99	.003	156.37	.088
District/former district	59	34.91	35.61		45.98		41.88		38.46	**	161.93	
Current experience ^a												
<24months	76	44.97	33.95	.107	44.54	0.34	40.55	.081	36.38	.307	155.42	.118
≥24months	93	55.03	35.81		45.77		41.86		37.24		160.68	
Other Zone and District nurses' experience ^a												
<24months	136	80.47	34.59	.181	44.68	0.09	41.06	.276	36.33	.007	156.66	.051
≥24months	33	19.53	36.55		47.42		42.15		39.00	**	165.12	
Clinical experience ^a												
<24months	68	40.24	36.13	.096	45.07	0.85	41.25	.962	37.03	.732	159.49	.572
≥24months	101	59.76	34.19		45.32		41.29		36.73		157.52	

* : p<.05 ** : p<.01

a: Welch's T-test

Factor 1: Community Initiative Promotion

Factor 2: Consensus Building for Community Needs and Activity Goal

Factor 3: Commitment to Work and Community People

Factor 4: Mutually Trusting Relationship with Community People toward Empowerment

Splitting method: Age: median value

Experience: Benner's transition framework from novice to expert

(2) Working environment

The influence of working environment on community orientation was examined. Median values were used to divide CHNs by the size of population to which they were assigned (<3,000 members, ≥3,000 members) as well as by the number of CHN colleagues in their workplaces (0-2, ≥3). Accessibility to supervisor as measured along a five-point Likert scale was also used to divide CHNs into two groups depending on favorable response for the items or not: those who responded that accessibility to supervisor was *difficult* to *neutral*, versus those who responded *somewhat easy* and *easy*. Likewise, the study population was also divided by the degree of office support for field visits as measured along a five-point Likert scale: those who responded *not supportive* to

neutral versus those who responded *somewhat supportive* and *supportive*.

Welch's t-test was conducted for population size, CHN colleague, and office support. Mann-Whitney's U-test was conducted for accessibility to supervisors. Table 24 showed the results. The group of CHNs assigned to <3,000 in population had significantly higher scores than those who assigned to $\geq 3,000$ in population for "Commitment" ($p=.019$), "Trusting Relationships" ($p<.001$), and "COSCHN" scores ($p=.006$). No significant group-dependent differences were observed in score of COSCHN and its factors when subjects were divided by number of CHN colleagues in the workplace, accessibility to supervisor, or office support for field visits.

Table 24: Influencing factors on COSCHN: Working environment

Items and characteristics			Factor1		Factor2		Factor3		Factor4		COSCHN	
	<i>n</i>	%	mean	<i>p value</i>	mean	<i>p value</i>	mean	<i>p value</i>	mean	<i>p value</i>	mean	<i>p value</i>
Target population ^a												
<3000	84	49.70	35.90	.105	46.44	.059	42.14	.019	38.43	.000	162.92	.006
≥ 3000	85	50.30	34.05		44.01		40.41	*	35.29	**	153.76	**
CHN Colleague in workplace ^a												
0-2	97	57.40	35.84	.086	45.70	.384	41.78	.111	37.30	.213	160.62	.111
3-	72	42.60	33.81		44.57		40.58		36.25		155.21	
Access to supervisors ^b												
not easy- neutral	17	10.06	35.59	.704	45.24	.792	41.35	.801	38.41	.234	160.59	.703
somewhat easy-easy	152	89.94	34.90		45.22		41.26		36.68		158.06	
Office support for field visits ^a												
not supportive- neutral	67	39.64	33.99	.158	44.00	.149	40.82	.347	36.37	.382	155.18	.138
somewhat supportive-supportive	101	59.76	35.65		45.92		41.53		37.15		160.26	
* : p<.05 **: p<.01 a: Welch's t test b: Mann-Whitney U test												

Factor 1: Community Initiative Promotion

Factor 2: Consensus Building for Community Needs and Activity Goal

Factor 3: Commitment to Work and Community People

Factor 4: Mutually Trusting Relationship with Community People toward Empowerment

Splitting method: Target population, CHN colleague in workplace: Median value

Access to supervisors, office support to field visit: Favorable or not favorable

(3) Education environment

The influence of CHN education on community orientation was examined.

CHNs were divided into two groups according to their educational background: those with only a diploma in nursing, and those with any other additional educational achievements. Subjects were also divided by the median value for workshop attendance (4)

Welch's t-test was conducted. Table 25 showed the results. No significant group-dependent differences were observed in score of COSCHN and its factors when subjects were divided by education background and workshop attendance.

Table 25: Influencing factors of COSCHN: CHN educational background

Items and characteristics			Factor1		Factor2		Factor3		Factor4		COSCHN	
	n	%	mean	<i>p value</i>	mean	<i>p value</i>	mean	<i>p value</i>	mean	<i>p value</i>	mean	<i>p value</i>
License ^a												
Diplomat/Registered nurse	143	84.62	34.79	.433	45.29	.783	41.10	.261	36.57	.084	157.76	.413
Other licenses	26	15.38	35.96		44.81		42.19		38.42		161.38	
Workshop attendances ^a												
0-4	96	56.80	34.03	.057	45.19	.956	40.71	.081	36.28	.118	156.21	.152
5-	73	43.20	36.21		45.26		42.01		37.60		161.08	

a: Welch's t test

Factor 1: Community Initiative Promotion

Factor 2: Consensus Building for Community Needs and Activity Goal

Factor 3: Commitment to Work and Community People

Factor 4: Mutually Trusting Relationship with Community People toward Empowerment

Splitting method: License: diploma only / advance education or not

Workshop attendance: median value

(4) Multivariate analysis of factors influencing community orientation

Stepwise multiple regression analysis was conducted to assess the degree to which the various factors influenced community orientation. Items shown by the bivariate analysis to affect significant differences in scores of COSCHN and its factors were used as independent variables, while COSCHN and its factors were used as dependent variables. No variables within "Initiative Promotion" and "Consensus Building" showed significant differences, and only one variable was found to yield a significant difference in COSCHN score. In the end, the two

factors, “Commitment” and “Trusting Relationships” were subject to analysis. Correlations were assessed by calculating Pearson’s correlation coefficients for each influencing factor used in this analysis. No items showed an $r > |\pm .7|$.

Population size and age were examined as independent variables with regard to their effects on “Commitment”. Result showed that only age was extracted ($\beta=.148$, $p=.032$). Analysis of variance showed a significant difference model ($F=4.701$, $p=.032$). R^2 was .027, adjusted R^2 was .022 (Table 26).

Table 25: Influencing factors of COSCHN: CHN educational background

Charactritics	B	SE	β	95%CI		p value
				Lowest	Highest	
Age	.148	.068	.165	.013	.283	.032
$R^2=.027$	Adjusted $R^2=.022$		$F=4.701$		$n=169$	

Population size, number of years in the current position, and CHN experience in areas other than that of the current position were examined as independent variables with regard to their effects on “Trusting Relationships”. Result showed that only population size was extracted. ($\beta=-3.17$, $p<.001$). Analysis of variance showed as a significant difference model ($F=18.670$, $p<.001$), with an R^2 of .101, and an Adjusted R^2 of .022 (Table 27).

Table 27: Stepwise multiple regression analysis of “Trusting Relationships”

Charactritics	B	SE	β	95%CI		p value
				Lowest	Highest	
Population	-1.111	.257	-.317	-1.619	-.604	.000
$R^2=.101$	Adjusted $R^2=.022$		$F=18.670$		$n=169$	

Multivariate analysis was continued using a trend analysis. Subjects were divided as follows. Age was divided into three groups (≤ 29 years old, 30-39 years old, and ≥ 40 years old). Population size they served was divided seven groups ($<1,000$, 1,000-2,999, 3,000-4,999, 5,000-6,999, 7,000-8,999, 9,000-10,999, and $\geq 11,000$). Working experiences were divided into three groups (<25 months, 25-47 months, and ≥ 48 months for all three parameters). Number of workshops

attended and the number of CHN colleagues at the workplace were divided five groups (0, 1-3, 4-6, 7-9, and ≥ 10 for both parameters). Scores on the 5-point Likert scale were also used to divide by their reported levels of office support for field visits and accessibility to supervisor. The following median values of each divided group showed constantly increased or decreased trend: current experience of “Initiative Promotion”, “Consensus Building”, “Trusting Relationships”, and COSCHN, other area CHNs experiences of “Consensus Building”, “Trusting Relationships”, and COSCHN, and workshop attendance of “Initiative Promotion”. Therefore, these factors were analyzed by Jonkheere-Terpstra analysis (Table 28). Workshop attendance showed a significantly higher trend in “Initiative Promotion” ($p=.016$).

Table 28. Trend analysis of influencing factors (Jonkheere-Terpstra Analysis)

	Factor1	Factor2	Factor3	Factor4	COSCHN
Current Experience	.065	.537	-	.212	.192
Other CHNs experience	-	.231	-	.024*	.194
Workshop Attendance	.016*	-	-	-	-

* $p<.05$

Factor 1: Community Initiative Promotion

Factor 2: Consensus Building for Community Needs and Activity Goal

Factor 3: Commitment to Work and Community People

Factor 4: Mutually Trusting Relationship with Community People toward Empowerment

4) Outcome analysis of community orientation

Four items were selected as outcome variables to characterize community orientation: quarterly report-making, analysis sheet utilization, review of sub-divisional (SD) plan, and annual planning. Each outcome variable was measured on a five-point Likert scale for which 1 was *not at all* and 5 was *completely*. Subjects were divided into two groups whether proactive and not for the each outcome activities: Group 1 scoring from *not at all* to *neutral*, and Group 2 scoring *very well* and *completely*.

Table 29 shows the analysis results. Mann-Whitney’s U test was

conducted as all outcomes did not showing symmetrical bell shape distributions. The COSCHN, “Initiative Promotion” and “Consensus Building” showed significant difference in all influencing factors. “Commitment” and Trusting Relationships” showed significant differences in analysis sheet utilization, SD plan comparison and annual planning.

Table 29: Outcomes of COSCHN

Items and characteristics	n	%	Factor1		Factor2		Factor3		Factor4		COSCHN	
			Mean rank	p value	Mean rank	p value	Mean rank	p value	Mean rank	p value	Mean rank	p value
Quarterly report ^b												
Group1	17	10.06	62.12	.042	61.24	.035	63.74	.058	77.76	.52	62.24	.043
Group2	152	89.94	87.56	*	87.66	*	87.38		85.81		87.55	*
Analysis sheet ^b												
Group1	57	33.73	68.64	.002	69.39	.003	73.09	.024	72.55	.018	68.02	.001
Group2	112	66.27	93.33	**	92.95	**	91.06	*	91.33	*	93.64	**
SD plan comparison ^b												
Group1	100	59.17	73.5	.000	73.4	.000	72.88	.000	75.55	.002	71.93	.000
Group2	69	40.83	101.67	**	101.81	**	102.57	--	98.7	**	103.94	**
Annual plan ^b												
Group1	113	66.86	76.58	.001	76.22	.001	77.35	.004	75.97	.001	75.11	.000
Group2	56	33.14	101.98	**	102.72	**	100.44	**	103.22	**	104.96	**
*: p<.05 **:p<.01 b:Mann-Whitney U test Group1: I did not do at all, I slightly did, neutral Group2:I did very well, I did completely												

* : p<.05 ** : p<.01

b: Mann-Whitney U test

Group1: I did not do at all, I slightly did, neutral

Group2: I did very well, I did completely

Factor 1: Community Initiative Promotion

Factor 2: Consensus Building for Community Needs and Activity Goal

Factor 3: Commitment to Work and Community People

Factor 4: Mutually Trusting Relationship with Community People toward Empowerment

Splitting method: Proactive for outcome activity or not

4. Discussion

1) Factors influencing community orientation

Based on the analysis framework (Figure 8), bivariate analysis was conducted to examine the following influences on community orientation: age, working experiences, working environment, and educational background. Analysis showed the followings as significantly influencing factors: population size for COSCHN ($p=.006$), age and population size for “Commitment” ($p=.027$ and $.019$, respectively), population size, current position, and experience as a CHN in a different area for “Trusting Relationships” ($p<.001$, $=.003$, $.007$ respectively). In the multivariate analysis, multiple regression showed age as influencing factor for “Commitment”, population size for “Trusting Relationships”. Jonkheere-Terpstra analysis showed a significant increase trend

in workshop attendance within “Initiative Promotion” ($p=.016$).

Based on multiple regression analysis, it can be concluded age was predictor for “Commitment”. As CHNs age, they experience various life events, many of which lead to better engagement with people and community health activities. However, age was not significantly influencing factors for other three factors. This result was unexpected because age of CHNs was reported by many other articles as an influencing factor for competencies and practices of CHNs (Takahashi, Takao, 2007, Guo, Hsu, Lin, 2008, Royer, 2011, Cross, Block, Josten et al., 2006). The result in this study suggested that CHN supervisors need careful monitoring and supervision disregard age in issues related on “Trusting Relationships”, “Consensus Building” and “Initiative Promotion”.

Population was identified as a significantly influencing factor for “Trusting Relationships” in multiple regression analysis, COSCHN and “Commitment” in bivariate analysis. The CHNs assigned to smaller populations are able to maintain close relationships with community people. Such CHNs understand culture, people lifestyle and health behavior. Under such environment, CHNs well perceive “Commitment”. These are foundational for community orientation. However, population size did not show significantly influences for “Consensus Building” and “Initiative Promotion”. “Consensus Building” contained not only information collection, but also dissemination and discussion about community health needs with community members in order to recognize health problems. “Initiative Promotion” also requires a proactive posture to encourage people with no motivation to feel empowered. Rather than just focusing on changing a specified health behavior, true empowerment is promoted through improvement experiences of social relationships and self-identification (Laverack and Labonte, 2000). Such a process requires a collaborative effort among community people for power sharing and CHNs work toward balancing power (Gottlieb, Feeley, 2009). The CHNs facilitate communication among community people to help them experience decision-making and assist in the transformation of inequality. Therefore, CHNs need

more strategically advanced intentions and attentions than basic and fundamental attitude.

The workshop attendance showed significant increases trend in “Initiative Promotion”, even though this variable was not found to be significant by the bivariate analysis. It indicated that current workshops effectively develop “Initiative Promotion”. Community involvement and empowerment are central themes in PHC. It is possible that the workshops attended by CHNs emphasized the importance of “Initiative Promotion”, such that CHNs who had attended more workshops had heard about and discussed on this topic more frequently, potentially yielding increased “Initiative Promotion”. That said, workshop attendance was not a significant factor for the other three factors in COSCHN. Workshop should be included these three concepts as well. On the other side, Saeki (2008) et al. stated that CHNs can learn from colleague and their seniors through actual cases to develop career. On-the job-site and active learning style discussion opportunities such as case conferences in workplaces or nursing forums may be more beneficial in terms of increasing community orientation.

2) Analysis of outcomes of community orientation

Outcomes of community orientation were assessed by quarterly report-making, analysis sheet utilization, SD plan comparison and annual planning. “Initiative Promotion” and “Consensus Building” were significantly related with all four outcomes. The COSCHN and its four factors significantly influenced analysis sheet utilization, SD plan comparison, and annual planning. This result confirmed that CHNs with a high degree of community orientation review and document their own activities well, and also try to understand the health status of their community area. This indicates that supporting CHNs to increase degree of community orientation would likely increase the effectiveness of their activity management. This finding is consistent with a study by Ginn and Moseley (2004), who found that community orientation was significantly influencing factor to health promotion activities within hospital organizations. Tulchinsky and

Varavikova (2014) stated that the community orientation approach is important for health promotion activities in PHC. The present study findings reveal that increased community orientation will improve the effectiveness of CHN activity management.

VIII. Implications for nursing

In order to address the growing burden of NCDs in Fiji, the health system of the MOHMS has re-directed its strategies to employ PHC approach (MOHMS, 2015). PHC is essential health care based on full participation of community people for empowerment (WHO, 1978). The COSCHN measures the essential components of PHC, which can be enlightening and useful as educational measures to improve the PHC approach by CHNs in Fiji.

Based on findings and discussions, the following suggestions are proposed.

1. Utilization of Community Orientation Scale for Community Health Nurses in Fiji

Firstly, COSCHN can be used in orientation programs for field attachment in collage of nursing and induction training for newly recruited CHNs in the MOHMS. COSCHN can serve as pre and post evaluation tool of such programs. The facilitators are also able to organize case study of community health activities and COSCHN can serve as an analysis tool during the discussions. The participants are able to have self-image in communities and increase their readiness after such programs. Secondly, COSCHN can serve as a self-assessment tool. Reviewing one's own attitude by COSCHN can help to identify ways to overcome weakness as well as find strengthens. Such assessment encourage CHNs to overcome weakness that results in confidence and effective management of community health activities. Thirdly, COSCHN can also be used as a coaching tool in supervisory visit and quarterly competency evaluation using the Competency Standard and Criteria for Community Health Nurses in Fiji. An appropriate attitude is not always easy to exhibit, and pointing out problems with someone's attributes could create discouragement. COSCHN can serve as discussion tool by checking each item in any factors depending on issues. Supervisors are able to understand CHNs by not only their observation but also

from CHNs point of view as rated items in COSCHN. Such understanding help supervisors provide reasonable advise to improve their attitude toward community people, work and community health activities. Lastly, COSCHN can be incorporated into any workshops in related to community health activities. This study verified that community orientation promotes effective activity management. The workshop planner can cover attitude aspect in addition of new knowledge and skills so that the workshop attendances can have self-image of implementations. COSCHN can serve as check list when planning contents of workshops and also as pre and post evaluation tool.

2. Supporting system for community orientation

To increase degree of CHNs' community orientation, this study suggests to establish or increase sharing opportunities of experiences among CHNs themselves. Supervisors should include discussion opportunities in regular sub-divisional CHN meetings. Nursing forums within divisions and the nation is also suggested. Such presentations would be culturally and environmentally adaptable to the audiences, allowing CHNs to upgrade effectively their practical knowledge. Presenters will also expand their competencies in community health activities through their preparations and presentations, and will motivate themselves. This type of knowledge and experience sharing also increases community orientation. Lastly, improving the accessibility of epidemiological information is suggested. Recently, the MOHMS introduced an online information management system. CHNs should be able to access the database for their division and nationwide. Easy access to the system will allow CHNs to obtain the latest statistics for their areas to analyze trends and compare them with other areas. Such information will help CHNs to assess community health needs.

3. Application of COSCHN to other Pacific Islands countries

The COSCHN can be used as a reference when developing a community orientation scale for other Pacific Islands countries. It is especially adaptable to the countries with small in population, with similar infrastructure and health system, and adapting the WHO Health Island Policy to their health strategies. The process of scale development begins with an examination of its framework and the items by a panel of experts. Then, reliability and validity of the revised version of the COSCHN should be assessed by pre-test to finalize the scale.

4. Application of research methodology

This research had systematic process through which the scale was developed. Situations was examined and research objectives were extracted by comprehensive literature review. The conceptual framework was developed by qualitative interviews supported by literature and health experts. The interview included various stakeholders, i.e. policy makers and community members, besides different levels of CHNs. All of their views were examined and then incorporated into the conceptual framework. The scale was developed based on the above framework, and implemented a field test targeting all CHNs in Fiji for examining validity and reliability. Such methodology bring out practical tool fitting culture, health policy and systems, and theories and concepts. It is suggested that Fiji CHNs and researchers apply this method to develop measurement instrument.

IX. Limitations

This research has several limitations.

The framework and COSCHN were developed for CHNs in Fiji. Given the environment and culture in Fiji, the present study results are most applicable to this population. Although the author encourage health experts and researchers to apply the framework and COSCHN to other nursing positions than CHNs in Fiji and also other Pacific countries, the present study results are limited in their applicability without further modification and testing.

Study 3 was simultaneously implemented alongside Study 2 to minimize the burden for participants. Factors other than the selected variables may influence community orientation. It would be best to reassess influencing factors pertaining to working environment. Also, items such as interpersonal relationships, teamwork, and leadership should be also considered as influencing factors for future studies. A questionnaire survey conducted by Monma (2000) identified that positive attitude toward community was related with motivation and sense of fulfillment. A meta-analysis by Blegenn (1993) revealed that job-satisfaction was associated with autonomy, recognition, fairness. As community orientation is self-concept in competency, other self-concept factors are possible influencing factors. The number of outcomes was also limited in the present study, and details and quality of community health activities should be assessed. In addition, analysis of documents and client satisfaction studies could refine the outcomes beyond what a self-administered questionnaire study would reveal.

Response bias may affect the results. Study 2 and 3 asked the participants to self-rate their opinion on the statements in the questionnaire. The participants may over or under rate their opinions. To reduce response bias, more concise orientation in the face sheet were necessary to understand study purpose and response accurately. All revised items in the original version of COSCHN were discarded. Wording should be more culturally appropriate and let CHNs get attention and carefully exam the meaning and context. .

Population size also affected the present study results. The total number of CHNs in Fiji was 268, 226 and 169 of whom were eligible subjects for Study 2 and Study 3, respectively. Therefore, the analysis power may not be large enough to identify subtle differences between influencing factors.

X. Conclusions

The present research study developed a framework and a scale, and explored influencing factors and outcomes of community orientation. The community orientation framework of CHNs was developed based on the perspectives of various experts and stakeholders in Fiji, which was supported by theories and studies. Community Orientation Scale for Community Health Nurse was developed including 30 items in the four factors: “Initiative Promotion” (7 items), “Consensus Building” (9 items), “Commitment” (7 items), and “Trusting Relationships” (7 items). The validity and reliability of the COSCHN was confirmed.

This study identified following influencing factors: age for “Commitment”, population size for “Commitment” and “Trusting Relationships” and COSCHN, experience in different area for “Trusting Relationships” and workshop attendances for “Initiative Promotion”. CHN supervisors should provide careful monitoring and supervision in regard to these three factors. In the outcome analysis, COSCHN significantly influence analysis sheet utilization, sub-divisional plan comparison, and annual planning. This indicates that supporting CHNs to increase degree of community orientation would likely increase the effectiveness of their activity management.

For nursing implications, this study suggested that COSCHN is used during guidance for field attachment in college of nursing and induction training for newly recruited CHNs in the MOHMS. It can be used for self-assessment tool to CHNs and coaching tool to CHN supervisors. Organizers of any community health workshops are encouraged to incorporate notion of COSCHN to their programs. This study also suggested to establish or increase regular case conferences in the workplaces and nursing forums to share experiences regarding community health activities. Also, improving CHNs’ accessibility to epidemiological information is suggested.

The COSCHN can be applicable to other Pacific Islands countries by conducting an expert panel discussion and pre-test.

Further study is necessary to determine other influencing factors and outcomes.

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