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Original Paper

A Systematic Review of Risk Factors and Approaches to Address Coronary Heart Disease (CHD) in Fiji

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Abstract

Coronary Heart Disease (CHD) is one of the leading causes of death globally. The Pacific Island Countries (PICs) including Fiji is facing a CHD crisis. Therefore, this study aimed to determine the risk factors, initiatives, services provided, and strategies of CHD prevention to provide recommendations for Fiji. The systematic review gathered studies from 4 electronic databases including Medline, Embase, Web of Science, and CINAHL that were published within the period of 2007 to 2017. The secondary data was also collected from the Fiji Ministry of Health and Medical Services (MoHMS), the World Health Organisation (WHO), and other health organisations reports and plans. All studies were scanned and reviewed by 2 independent researchers using Covidence automation tool. Duplicate studies were omitted and the abstracts of remaining studies were read. Additional abstracts were excluded as they were irrelevant and the full text of remaining studies were read for further analysis. Twenty-one studies met the study criteria from which data were extracted and analysed to identify themes. The results showed that majority of studies were conducted beyond 2015. Four themes were identified including better healthcare services delivery, initiatives and interventions for CHD, risk factors to CHD, and enforcement of health policies. This study highlighted the importance of reviewing current polices, health services, and preventive strategies in controlling CHD among Fijians. Providing tailored interventions using health promotion approaches by considering the risk factors of CHD is highly recommended.

Keywords: Risk factors, Health services, Healthy Policy, Coronary Heart Disease, Fiji

Abbreviation:

CVDs= Cardiovascular Diseases

CHD= Coronary Heart Disease

IHDs= Ischemic Heart Diseases

MoHMS= Ministry of Health and Medical Services

NCDs= Non-communicable Diseases

PICs= Pacific Island Countries

STEPS= STEPwise Approach to NCD Risk Factor Surveillance

WHO= World Health Organisation

Introduction

Coronary Heart Disease (CHD) can lead to death if it is not properly managed at the initial phase when patients present with signs, symptoms, and pain [1]. It is one of the leading causes of death globally and can be prevented [2]. Sultan et al, [4] stated that CHD is caused by 6 major risk factors of individual depression, anxiety, stress, low social support, type A behaviour, and work-related stressors

[3-4]. Patients with CHD require secondary level of healthcare delivery of patient centred approach, and better physician-patient relationships [5]. Globally, CHD contributes a huge amount of economic burden to the health system [6], increased societal costs [1], and requires strengthening of national public health system and cost effective policy [6].

Sanjuan et al, [7] highlighted that CHD leads to poor health and depressive symptoms. Li et al, [8, 8] stated that CHD contributes to various types of cerebrovascular disease and threatens patient's life. CHD affects mental health, dietary, hygiene, and lifestyle [9]. CHD also leads to other non-communicable diseases (NCDs) as well [10]. For patient's living with CHD, exposure to air pollution adversely affects cardiovascular functions [11]. CHD contributes to poorer health related-quality of life [12], affects older age adults [13], and stroke burden in the society [14].

CHD starts in childhood, even if the symptoms first occur in the middle age [15]. In 2008, it was noted that in Fiji, the rates of morbidity were high due to diabetes and hypertension in 2007 [16]. From 2009 to 2016, rates of morbidity and hospital admissions in Fiji increased, and this was due to high rates of diabetes, chronic kidney diseases, and hypertensive disease that lead to the high rates of patients with ischemic heart diseases (IHDs) [17].

CHD is prevalent and has significant impact on morbidity, mortality, and overall health care costs [18]. According to Clarke, [19] in Fiji, the diseases associated with CHD are arthritis, diabetes, depression and anxiety, psoriasis, and kidney disease. Mortality rate patterns from 2014 to 2016 shows that diabetes and CHD were leading the mortality rank table in Fiji [20]. In low- and middle-income countries like Fiji, the risk of developing CHD is attributed to poor health outcome [21]. Smoking, poor diets, and physical inactivity, overweight, high blood pressure, and high blood glucose and cholesterol levels are risk factors for CHDs [14].

DeLorenzo, [22] states that CHD in Fiji caused 1300 deaths in 2012, totalling 21.8% of Fijian mortality. In 2011, CHD was the leading cause of death amongst young Fijian adults. A Fijian study by Witter et al., [23] showed that poor lifestyle choices contributed to a higher CHDs in 2016 after a reduction in 2010 to 2015. They later discussed that low socio-economic status increases the chances to be at risks to develop CHD.

The pattern of CHD is a crisis among Fijians due to its detrimental effect, particularly for those in the productive age group between the ages of 30 to 60 years old. Individuals with diabetes are more at higher risk of developing heart disease [24]. Overweight/obesity are also a huge concern in in Fiji which are the major risk factors towards IHDs as well [25]. This lifestyle is due to urbanisation, modern lifestyle, and transitions of lifestyles that change healthy traditional behaviours to western living standards [26].

A 2016 mini STEPS survey conducted in Fiji showed no significant difference in Fiji's population health status when compared to the 2011 STEPS survey. It showed that the rates of CVD events and deaths are high among the males of Indian descent (8.5% Indian, 8.1% iTaukei (Indigenous Fijians) while for females; iTaukei females were at high risk of having CVDs at 7.9% and Indian females at 6.0% [15].

This review study aimed at determining the risk factors, initiatives, services provided, and strategies of NCDs including CHD in Fiji from 2007 to 2017. The study analysed the extent of policy planning and programme development by various non-governmental organisations (NGOs) and private societies towards the reduction of NCD in Fiji. It also explores the current government initiatives in Fiji that seek to reduce CHD rates.

Methods

Search strategy

This review adopted the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guideline [27]. Four electronic databases including Medline, Embase, Web of Science, and Cinahl were used to find relevant studies. Keywords included: (NCDs OR "non-communicable disease"), (CVD OR "cardiovascular diseases"); (CHD OR "coronary artery disease"), (IHD OR "ischemic heart disease"), trend, AND Fiji. The study design uses the systematic literature search

technique for each of the searched databases, the researcher used; 'AND', 'OR', 'brackets', 'asterisks', 'open and closed inverted commas' for key words, in between two key words, and before and after the search sentences. The secondary data was also collected from the Fiji MoHMS, WHO Fiji Office, and other health organisations reports and plans.

Inclusion and exclusion criteria

The study looks at both genders, all age categories, ethnicities, geographical areas, cultural backgrounds, as well as the religious and economic status of people living within Fiji from 2007 to 2017. The research emphasizes the risk factors of CHD, its treatment, diagnosis, prognosis, preventions, and the management strategies used to eradicate it. The intervention techniques, medical services, public health programmes, and health policies and frameworks used in the country to eliminate NCDs were also considered. The review also focuses on research conducted in other Pacific Island Countries (PICs) and non-Pacific island countries for cases of NCDs that are relevant for Fiji setting. The research study focuses solely on NCDs excluding, communicable diseases, water borne diseases, and air borne diseases.

Article selection

Two independent reviewers collected data from each report using Covidence as automation tool. All articles' titles were scanned and duplicated studies omitted. The abstracts of remaining studies were reviewed to obtain the final full text articles for this study. Full text of remained studies was read and studies that did not meet the inclusion criteria were excluded. The bibliography of remained studies was finally checked and few studies were added to the research. Finally, 21 studies were used for analyses in this study (Figure 1).

Figure 1

A data extraction sheet was developed and information related to each study such as the methodology and results were summarised for further analysis (Table 1).

Table 1

The data were analysed thematically. The categorised themes were further used to elaborate on the results and data gathered from the reports, and articles that are in line with the research. These themes were thoroughly elaborated on in the result and discussion sections of this paper. This synthesising process has enabled the researcher to successfully achieve the desired goal of the research.

Results

This section summarises the findings of various studies targeting CHD and its management to health and quality of life status.

Four themes were identified for patients living with CHD and their care providers in Fiji, Pacific Island Countries and Territories and globally including; better healthcare services delivery, initiatives and interventions for CHD, risk factors to CHD and enforcement of health policies.

Theme 1: Better healthcare services delivery

Globally, the CHD status is still a challenge with increasingly higher rates of admissions and morbidity from 2009 to 2016. The Fiji MoHMS report and weekly updates from various department in the ministry and health sectors in Fiji emphasised that there is a huge need of improvements towards the healthcare services delivery to improve quality of life for patients with CHD[16-17, 20, 25, 28-29, 24, 30-34].

It was crucial that the services provided needs to be aligned to the national standard guideline provided by Fiji MoHMS under the Diabetes Management Guideline [28]. The Cardiovascular Therapeutic Guidelines [29], and National Strategic Plan [17] should to be adopted by all health specialists to reduce referrals to major hospitals to avoid delaying complications while CHD patients are enjoying their quality time with their loved ones [28].

For this, the guideline is expected to be used to improve health over the next 5 years [17]. These

guidelines provide a holistic approach to management of cardiovascular diseases including pharmacological and non-pharmacological therapies with comprehensive treatment options for patients [29].

Theme 2: Initiatives and interventions for CHD

There were various methods and strategies being used to reduce cases of CHD worldwide, for instance using the auto-encoder model, a device/tool used for medical test and are widely used by all developed countries to help reduce CHD [2]. The strategies are to improve health for CHD patients through regular physical activity [4] as well.

It was highlighted that taking radical measures such as prevention will improve public healthcare that benefits CHD patients [22]. Moran, A,E., et al., (2014) noted that there is a need to prevent and control risk factors of behavioural and environmental determinants in Eastern Europe and Central Asia due to its higher ischemic heart disease that leads to CHD [35]. As noted by Snowdon, W., et al., (2013) there is also a need for all individuals and communities' to address the high levels of NCD and its risk factors in Fiji and other Pacific Island nation [36]. For this, it was stated that eHealth cardiac rehabilitation will significantly promote the duration of physical activity, daily steps, quality of life [36], and a strong patient-physician centered approach is required [5].

The study also highlighted that innovative and practical methods will improve hypertension control including community engagement, salt reduction, salt substitution, task redistribution, mHealth, and fixed-dose combination therapies [18]. WHO (2013) pointed out that reviving of traditional cooking in own Pacific Island way will be the best therapy to CHD [1].

Theme 3: Risk factors to CHD

Cardiovascular disease is defined as the mismanagement of three health behaviours including tobacco use, diet, and physical activity; four health factors of body weight, blood pressure, blood cholesterol, and blood glucose [21]. The leading health factors in cardiovascular disease are hypertension [3], anxiety [8], depression, stress, low social support, and work related factors [4]. For this, 17.7 million people are dying from CHD in 2015 globally representing 31% of global deaths [37]. This mortality rate appears to be the changes of health transition associated to socio-cultural aspects including poor lifestyle choices that precede CVD [23].

Tusek-Bunc, K., et al., [12] highlight that patients with CHD with more than one comorbid condition have poorer health-related quality of life. CHD impact the daily lifestyle that increases the in-stent restenosis rate [9]. Warburton, D., et al., [11] highlighted that people with CHD should minimize their exposure to air pollution via limiting their outdoor physical activity participation.

Theme 4: Enforcement of health policies

It was noted that health policies are not enforced by Ministry of Health especially in the Pacific. A study conducted by Sanjuan, P., et al., (2014) suggests that intervention programme should be targeted at replacing global attributions of negative situations with more specific explanations about disease management, and treatment for patients with CHD [7].

Discussion

This study highlighted the main risk factors and determinants of CHD in Fiji. According to Moran et al., (2014) in trying to reduce the increasing cases of CHD, the behavioural and environmental determinants should be addressed [35]. Vedanthan et al., [18] emphasised that CHDs are manageable and preventable as well. The reduction of salt intake in the diets, medication compliance, and combination of therapies should be a priority for an individual as these elements are leading factors for control of hypertension which can potentially lead to CHD, heart failure, stroke, and deaths [18].

DeLorenzo et al., (2017) discussed that heart disease could be prevented via reducing alcohol consumption and smoking, and reducing systolic blood pressure with an increase of primary and secondary prevention interventions by anti-heart disease programmes [22]. Clarke et al., [19] added that declining adult risk factors would prevent heart diseases. People with chronic medical conditions should reduce their outdoor activity, air pollution exposure, and participation in an open environment as

air pollutant can affect their breathing and heart condition status [11].

Fiji MoHMS and other studies in the literature highlighted that CHD can develop from diabetes mellitus [36]. Fiji MoHMS, Heart Foundation Fiji, and partnering agencies are advocating regular medical check-ups and empowering citizens to have healthy nutrition and diets; maintain healthy weight; avoid smoking and alcohol consumption; reduce blood cholesterol, and declining blood pressure [37]. The Cardiovascular Management Guidelines were developed showing ways and processes to adhere to manage heart cases. Medication, treatment, and referrals were also provided to patients by the same partnering organisations to prevent severe complications caused by heart diseases which would later be costly for the families and the society [29]. As discussed by Carter et al., [14] Fiji requires an effective standardised control strategy to prevent CHD and this needs to be emphasised at all levels.

There were various forms of interventions and new initiatives towards the management and prevention of CHD. MoHMS, [29] developed a guideline called Cardiovascular Therapeutic that targets CHD patients and care givers as well. Even though a guideline document was developed and is used by the country along with different levels of interventions and assistance provided from different organisations and agencies as well as international countries providing heart surgery, trends for CHD mortality in the country are seen to be increasing every year [29].

Fiji MoHMS (2015) noted that CHD risk factors are behavioural, genetics, and chronic health factors that all contributed to high CHD in 2016 [25]. The latest report released by MoHMS is that CHD is a leading cause of death in the country for the iTaukei males and females of Indian descent. Despite this change in trend, CHD remains a burden for many Fijians. This may be due to unhealthy diets, physical inactivity, high body mass, high consumption of alcohol, high body fats and cholesterol, smoking, and existing cases of hypertensive, and diabetes [25].

These shifts show that urban Fijians consumed a lot of unhealthy food and drinks with unhealthy eating patterns and behaviours including; large portion sizes of food; high consumption of frizzy drinks; high intake of canned and packed food; high ingestion of unhealthy take away foods from restaurants and other food outlets; high salt in the diet; sedentary lifestyles; physical inactivity; excessive alcohol consumption and smoking; limited consumption of green leafy vegetables and fruits; and high levels of stress that all contribute to the high increasing of ischemic heart diseases in Fiji [16-17, 20, 25, 28-29, 24, 30-34].

The treatment of CHDs highlighted in the guidelines is that patients should be closely monitored and followed up by health staff as they may develop other related diseases such as strokes, kidney diseases, and death if they are not well monitored [29]. It was noted that the medication provided for patients with CHD at the first onset of an attack will need to continue be taken for every attack he/she faces. Fiji MoHMS further discussed that every cardiac case should be referred and discussed at the Cardiac Medical Unit in hospital for early treatment [29]. The treatment of severe heart cases and complications should be referred internationally for cardiac/heart surgery to prevent premature deaths.

Fiji MoHMS [29] designed and developed a CHD management guideline targeting all age groups and ethnicities in the country to manage and prevent the prevalence of heart disease. This guideline document was also used to assist the reduction of diabetes and chronic kidney disease cases via management prior to the preventative and curative methods highlighted in the guideline manual. The National Diabetes Management Guidelines [28] were formulated to assist and support the management guideline for CHD, to manage the onset of CHDs for patients with diabetes, and for heart disease patients in terms of management and prevention that could may lead to severe complications if not managed appropriately.

Suggestion to Fiji

Fiji MoHMS and Tappoo ([16, 37] reinforced the importance of having healthy diets, maintaining a healthy weight, increasing physical activity, avoiding smoking and alcohol consumption, reducing cholesterol levels, reducing salt intake, and living stress-free. Fiji MoHMS [34] has developed different sets of guidelines and manuals to assist the nation in managing, controlling, and preventing the prevalent CHDs. These manuals include; the National Toolkit Programme, National Clinical

Service Network Guidelines, and Standard Treatment Guideline for Management of CHDs. Fiji MoHMS, WHO Western Pacific Region Fiji Office, and several partners and stakeholders in the country, are working in partnership to address ischemic heart diseases nation-wide [34].

Fiji MoHMS (2015) developed and endorsed National Cardiovascular Therapeutic Guidelines that cover the strategies and management activities for patients with CHDs and for their carers as well [29]. The guidelines provided a way forward for the country to lay a platform that could assist to eradicate CHDs in Fiji and consequently deaths caused by CHDs.

Limitations

There were insufficient data available for the few diseases identified in Fiji MoHMS report. The statistics provided only focused on major alarming diseases while there was limited or no information provided for other diseases like cerebrovascular diseases and respiratory infections. Due to delays in reporting annual reports, many of the diseases were underreported, many cases were still in the process of assessment, and much data was lost due to unrealiable reporting systems.

Conclusion

The cardiovascular management guidelines, treatments, and on-going interventions provided to the public, especially heart cases patients and caregivers has influenced the health outcome of CHD in Fiji to decline in many medical divisions in the country. A community -centered bottom-up approach should be considered as a way forward to achieve the desired goals set by the MoHMS. A bottom-up approach would require a lot of patience to achieve the best possible health outcomes and to improve the healthcare system. Greater interventions such as awareness raising via community education; school health talks; institution health rallies; faith based group health workshops; the national heart health road show; and national campaign on heart disease prevention still need to be provided to the public showing strategies and mechanisms to help eradicate the epidemic of IHDs in Fiji.

Conflict of Interest

There is no conflict of interests.

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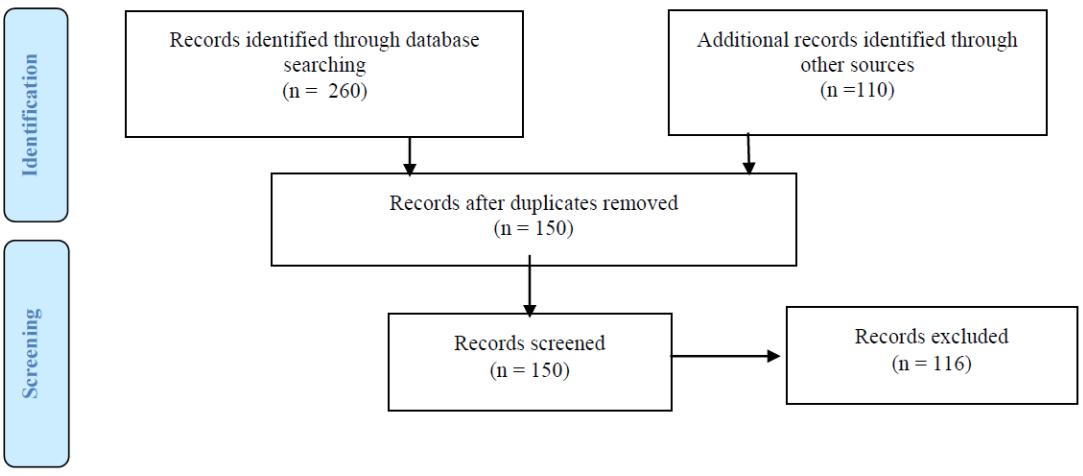

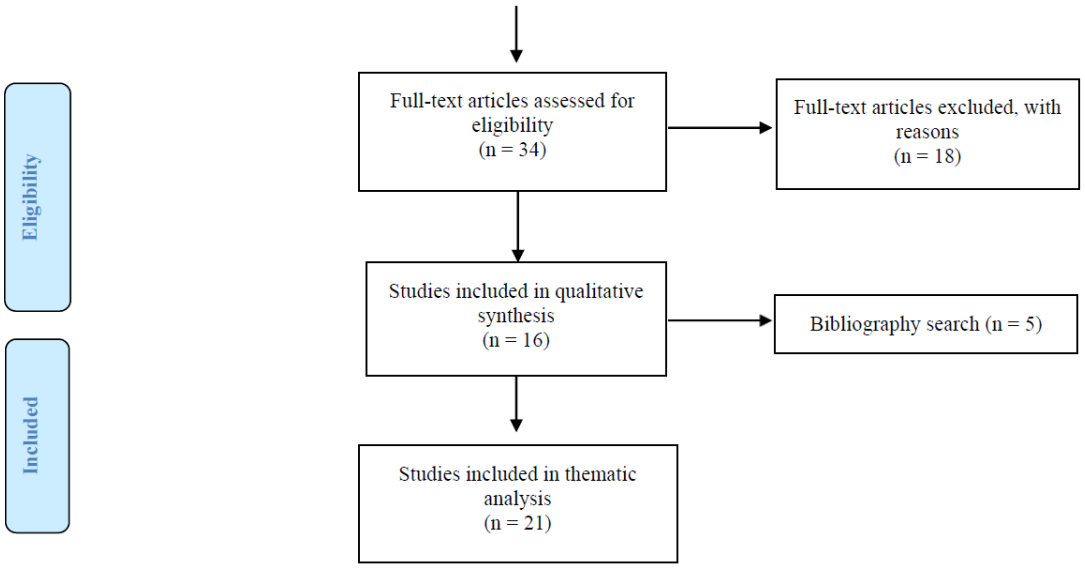

Figure 1. Study search process

Table 1. Characteristics of various studies in a data extraction sheet format

Author	**Year**	**Aim/Title**	**Key Findings**
World Health Organisation Western Pacific Region.[1]	2013	Towards Healthy Islands; Pacific Non-Communicable Disease Response.	• The study indicates that reviving of traditional cooking in own Pacific Island way would be the best therapy.
Carter, K., et al.[14]	2011	The mortality trends in Fiji; The trends, boutique gym to lose weight fast and burn fat treatment	• Regular physical activity is prevention to NCD.
Gyaneshwar, R., et al.[15]	2016	Absolute cardiovascular risk in a Fiji medical zone	• A mini STEPS survey was conducted in many of the hundreds medical settings in Fiji and concluded that there was no significant difference to Fiji's population health status when compared to the 2011 Fiji STEPS survey.
Fiji MoHMS.[16]	2010	The National Annual Report	• A yearly report of updates from the Ministry of Health departments and recommendations for health care service delivery improvement in Fiji.
Fiji MoHMS.[17]	2016	The National Strategic Plan 2016 – 2020	• The guiding document supporting the efforts of the Ministry of Health and Medical Services to improve health over the next five years.
Clarke, D.[19]	2017	Boutique gym to lose weight fast and burn fat	• The contributing diseases to CHD are arthritis, diabetes, depression and anxiety, psoriasis, and kidney disease.
Fiji MoHMS.[20]	2016	The National Notifiable Disease Surveillance Bulletin.	• The notifiable diseases analyses results presented to the Ministry of Health.
DeLorenzo, G.[22]	2017	The Current Major Diseases in Fiji.	• Fiji would benefit from taking radical measures to improve public healthcare.

Witter, T., et al.[23]	2015	A conceptual framework for managing modifiable risk factors for cardiovascular diseases in Fiji.	• The study depict that Fiji's health transition has been associated with changes to socio-cultural aspects including poor lifestyle choices that may contribute to a cluster of cardio-metabolic conditions which precede CVD.
Fiji MoHMS.[25]	2012	The Diabetes Management Guidelines; NCD Control	• The guideline was adopted in Fiji and was decentralize to reduce referrals to major hospitals to avoid delaying complications while enjoying a better quality of their life.
Fiji MoHMS.[26]	2015	The Cardiovascular Therapeutic Guidelines	• The guideline provides a holistic approach to the management of cardiovascular diseases including pharmacological and non-pharmacological therapies with comprehensive treatment options for patients.
Fiji MoHMS.[27]	2015	The National Annual Report	• A yearly report of updates from the Ministry of Health departments and recommendations for health care service delivery improvement in Fiji.
Snowdon, W., et al.[29]	2013	The non- communicable diseases and health system responses in Fiji	• A need for all individuals and community's to address the high levels of NCD & risk factors in Fiji and other Pacific Island nations.
Tappoo, K.[30]	2017	The cardiovascular disease	• The study shows that 17.7 million people died from cardiovascular disease in 2015 representing 31 per cent of all global deaths.
Fiji MoHMS.[31]	2016	The National Annual Report.	• A yearly report of updates from the Ministry of Health departments and recommendations for health care service delivery improvement in Fiji.
Fiji MoHMS.[32]	2017	The National First Quarter Report	• The first quarter report updates from various health care settings in Fiji and recommendations made to the Ministry of Health and Medical Services for improvements.
Fiji MoHMS.[33]	2011	The National Annual Report	• A yearly report of updates from the Ministry of Health departments and recommendations for health care service delivery improvement in Fiji.
Fiji MoHMS.[34]	2012	The National Annual Report	• A yearly report of updates from the Ministry of Health departments and recommendations for health care service delivery improvement in Fiji.
Fiji MoHMS.[35]	2013	The National Annual Report	• A yearly report of updates from the Ministry of Health departments and recommendations for health care service delivery improvement in Fiji.
Fiji MoHMS.[36]	2014	The National Annual Report	• A yearly report of updates from the Ministry of Health departments and recommendations for health care service delivery improvement in Fiji.
Fiji MoHMS.[37]	2014	The Non – Communicable Diseases Strategic Plan 2015 – 2019	• A National Strategic Plan for NCD to be achieved by 2019.