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Knowledge or awareness of non-communicable diseases and their associated risk factors among university students in Fiji: A cross-sectional study

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Abstract

Introduction: Chronic diseases (aka Non-communicable diseases, NCDs) contribute to the global burden of morbidity and mortality, with a significant share of premature deaths among low-and middle-income countries (LMICs), including Fiji. The early exposure to the risk factors of NCDs affects the entire life course; knowledge or awareness of adolescents towards NCDs and associated risk factors is critical for health promotion. This study aims to investigate the knowledge or awareness level of chronic conditions and their risk factors among Fijian students.

Methods: In this cross-sectional study, a sample of 338 university students was recruited using the paper as well as web-based pre-tested survey through a convenience sampling technique. Differences in knowledge or awareness by gender, study year and program were analyzed using Chi-square/Fisher exact test.

Results: Our research showed a higher proportion of females had knowledge or awareness about the increasing prevalence of NCDs in Fiji and associated risk factors as opposed to males. Among different programs, students enrolled in physical education were more likely to be aware about the global death toll attributed to NCDs compared to those enrolled in science majors. As expected, the awareness levels were higher among second- and third-year students than freshers. The most prominent information sources of NCDs reported by the students were teachers.

Discussion: These findings highlight the need of developing school-based health awareness and promotion programs.

Take-home message: The findings of this study will serve as the baseline data to develop new programs and to evaluate existing programs (if any), as limited data are available related to the implementation of NCDs prevention efforts in Fiji Islands.

Key words: Fiji; Health education; Health promotion; Non-communicable disease; Pacific islands; Students.

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INTRODUCTION

Non-communicable diseases (NCDs) contribute to the global burden of morbidity and mortality, with a significant share of premature deaths among low-and middle-income countries (LMICs) [1]. NCDs have a far-ranging impact on health, which translates into the higher healthcare cost associated with it [2]. Reportedly, four major types of NCDs, including cardiovascular diseases, diabetes mellitus, chronic respiratory disease, and cancers affect every 4 in 5 people, with over 75% of deaths occurring in LMICs alone [1–3]. The impact is more pronounced in the Pacific islands (e.g., Fiji Islands) with more than three-quarters of annual deaths attributing to NCDs [1,2]. According to recent evidence, the mortality rate due to diabetes alone was 188 deaths per 100,000 Fijian population in 2018 [4]. The life expectancy has been reduced significantly over the past decade due to the increased burden of non-communicable diseases in the Fiji Islands [5]. The associated risk factors of NCDs include aging, unhealthy food, sedentary lifestyle, high blood pressure, hyperglycemia, hypercholesterolemia, and obesity [6]. These factors are highly prevalent and predispose Fijians to NCDs early in life leading to premature mortality [5,7]. Besides the high prevalence of risk factors, healthcare access barriers, socio-economic conditions, cultural constraints, and fragmented healthcare systems are the additional challenges widely dispersed among LMICs and Fiji is one of them [3,8]. To address these issues, the World Health Organization (WHO) developed an action plan for the global strategy for prevention and control of NCDs. Promoting research related to the prevention and control of NCDs among geographical units with a higher burden of NCDs was one of the overarching goals of that action plan [9].

Fiji has one of the highest rates of NCDs across the world, with significant mortality among adults under 60 years resulting in greater disability-adjusted life years (DALY) and years of potential life lost [10,11]. The key drivers associated with premature mortality include adverse behaviours and lifestyle factors, particularly substance use and poor diet among adolescents [12]. According to the mounting evidence, nearly 3/4th of the premature deaths occurring in adulthood are the result of unhealthy behaviors initiated during childhood or adolescence [13,14]. Early exposure to the risk factors affects the entire life course, therefore the health of current and future generations should be prioritized [13,14]. It is critical to develop targeted interventions to raise awareness about NCDs and their associated risk factors among younger adults. To achieve this goal, the collection of the baseline data will be helpful to inform future health promotion programs and policies. Till today, there is a lack of evidence related to the knowledge and awareness of NCDs and associated risk factors among Fijian students, which the current study endeavors to assess.

This study aims to investigate the knowledge or awareness level of chronic conditions and their risk factors among Fijian students. The findings of this study will serve as the baseline data to develop new programs and to evaluate existing programs (if any), as limited data are available related to the implementation of NCDs prevention efforts in Fiji Islands.

METHODS

Study design, participants, and sampling

This was an exploratory and cross-sectional study, conducted during March-November 2020 in the Fiji National University, Lautoka campus. Full-time scholar and day scholar students of Bachelor of Education -Secondary and Primary (B. Ed.), Bachelor of Science (BSc). and Trade Diploma in Sports Science

students were invited to participate in the survey. Participants representing all three years from different majors were included. A convenience sampling was utilized to recruit the sample of university students.

Study instruments

The survey questionnaire had four sections with a total of 42 questions. The first section of the questionnaire included demographic questions, e.g. age, gender, years of study, nature of the physical activity, and lifestyle habits, etc. The second section was designed to assess student's knowledge and awareness regarding general information on NCDs. The last two sections included questions related to knowledge and awareness of risk factors and management of NCDs, respectively. The questionnaire was adapted according to the latest information available on the Government websites and the Ministry of Health and Medical Services, Fiji [15–17]. The face and content validity of the survey was assessed by subject matter experts (SMEs) and several iterations of the survey were made before the finalization of the survey tool. Since this survey was not based on theoretical constructs, construct validation was not performed. Pre-testing of the survey by investigators and a few students was conducted before the dissemination. The data were collected primarily through paper-based survey. The survey copies were distributed to the students during class sessions after taking approval from lecturers. To maximize the sample size, we also used an electronic version of this survey through Google form to recruit participants from campuses other than the Principal Investigators' location.

Data analysis

Participants' responses were first preprocessed and then exported to IBM SPSS version 27.0 (IBM Corp. Armonk, NY, USA) for statistical analyses. Incomplete responses and those with invalid data entries were excluded. Mean and standard deviation was used to represent continuous variables. Counts and proportions were used to express categorical variables. Confidence intervals of proportion were calculated and p values less than 0.05 were considered statistically significant. Chi-square/Fisher exact test was conducted wherever appropriate. Sample size estimation of chi-square test was conducted through G* Power software packages using Cohen's medium effect size of 0.3 at the power of 99% [18,19]. The minimum sample required was 297 and after factoring in 15% of missing (n=45), the final sample required was 342 participants. The final sample size was deemed appropriate to investigate hypothesized effects.

Ethical aspects

Approval for conducting this study was obtained from the Committee on Human Research Subjects (CHRS# 3-20, March 24, 2020), Fiji National University, Fiji Islands. The ethics committee reviewed/approved this study protocol, participant information sheet (PIS), informed consent form, and the survey questionnaire. All study participants were requested to sign the informed consent to confirm their willingness to participate by answering an agree/disagree question at the start of the survey. Informed consent included detailed information related to the aim and significance of the study so that participants could make an informed choice about whether to participate or withdraw at any time if he/she so wished.

RESULTS

A total of 338 participants participated in the study, of whom 71% were females and the rest were males. The proportion of students by the current year of study was comparable across first, second, and final years (Table 1). More than 50% of participants were *iTaukei, with* 42.60% being Indo-Fijians. The detailed demographic profile of the respondents can be seen in Table 1.

Table 1. Summary statistics of the study population (*n* = 338).

Variable	Groups	n (%)	95% CI (LCL, UCL)
Age	16-20 years	152 (45.0)	39.5, 50.5

	Above 20 years	186 (55.0)	49.5, 60.4
Gender	Female	240 (71.0)	65.8, 75.7
	Male	98 (29.0)	24.2, 34.1
Ethnicity	I-taukei	190 (56.2)	50.7, 61.5
	Ind-Fijian (Fijians of Indian descent)	144 (42.6)	37.2, 48.0
	Others (Samoan minorities)	4 (1.2)	0.3, 3.0
Degree Program	Bachelor of Education (B.Ed.) *	218 (64.5)	59.1, 69.6
	Bachelor of Education, Physical Education	53 (15.7)	11.9, 20.0
	Bachelor of Science	50 (14.8)	11.1, 19.0
	Others**	17 (5.0)	2.0, 7.0
Year of Study	First year	113 (33.4)	28.4, 38.7
	Second year	113 (33.4)	28.4, 38.7
	Third/Final year	112 (33.1)	28.1, 38.4
Area of residence	Rural	148 (43.7)	38.4, 49.3
	Urban/Semi urban	190 (56.3)	50.8, 61.6
Attended workshops or lectures on NCDs	Yes	148 (43.9)	38.4, 49.3
	No	188 (55.8)	50.1, 61.0
Source of information to know about NCDs	Social media	94 (27.8)	23.1, 32.9
	Newspaper	28 (8.3)	5.6, 11.8
	Television	51 (15.1)	11.5, 19.4
	Radio	33 (9.8)	6.8, 13.4
	Faculty (Teacher)	125 (37.0)	31.9, 42.3
	Other	7 (2.1)	0.8, 4.2

Note: The percentages may not add up to 100% due to missing data. *B. Ed includes all streams except Physical Education **includes Commerce, Engineering, Law, Sports Science, etc.; LCL=Lower confidence level; UCL = Upper confidence level.

The most prominent information source of NCDs reported by the students were teachers followed by social media (Table 1). Every 4 of 10 participants reported attending the NCD awareness campaigns and were aware of the NCDs strategic plan introduced by the Fiji government. Only 45.3% of participants were aware of the WHO Global action plan for the prevention and control of NCDs (Table 2).

Table 2. Self-reported behaviors, practices, opinions of the study population (*n* = 338).

Variable	Responses	n (%)	95% CI (LCL, UCL)
Know about BMI	Yes	246 (72.8)	67.7, 77.5
	No	89 (26.3)	21.8, 31.4
Ever tried to check BMI	Yes	200 (59.2)	53.7, 64.5
	No	132 (39.1)	33.8, 44.4
Smoking	Yes	91 (26.9)	22.2, 31.9
	No	247 (73.1)	68.0, 77.7
Alcohol	Yes	162 (47.9)	42.5, 53.4
	No	176 (52.1)	46.6, 57.5
Eat junk food	Yes	322 (95.3)	92.4, 97.2
	No	16 (4.7)	2.7, 7.6
Most of NCDs are preventable	Yes	296 (87.6)	83.6, 90.9
	No	42 (12.4)	9.1, 16.4
Ever attended an NCD awareness campaign	Yes	146 (43.2)	37.8, 48.6
	No	190 (56.2)	50.7, 61.6
Awareness of WHO Global action plan 2013-20 for prevention and control of NCDs	Yes	153 (45.3)	39.8, 50.7
	No	183 (54.1)	48.6, 59.5
Knowledge about the Fiji government NCDs strategic plan	Yes	141 (41.7)	36.4, 47.1
	No	192 (56.8)	51.3, 62.2
Education related to NCD should be integrated with existing curriculum	Yes	318 (94.1)	91.0, 96.4
	No	19 (5.6)	3.4, 8.6

Note: CI= Confidence interval; LCL=Lower confidence level; UCL = Upper confidence level; The percentage may not add to 100% due to some missing data.

In our sample, a greater proportion of females were aware of the increasing prevalence of NCDs in Fiji as opposed to males (99.6% vs. 91.8%; p =0.001; Table 3). In contrast, males were more likely to know about the NCD responsible for the highest mortality in Fiji compared to their female counterparts (30.6% vs. 21.3%, p =0.005; Table 3). Across different programs, those belonging to B.Ed. and B.Ed. in physical education were aware more about the annual global mortality burden attributed to NCDs compared to BSc. (22.0% vs. 13.2%, p =0.04; Table 3). Across the different years of study, those belonging to the second year were heard about NCDs compared to third year (100% vs. 99.1%, p = 0.03; Table 3). Second- and third-year students were more likely to report that NCDs are prevailing in Fiji compared to first students (100% vs. 92.0%, p =0.006; Table 3). In contrast, the third year was more likely to know about the name of the NCD responsible for the highest mortality in Fiji compared to the second year (58% vs. 56.6%, p =0.012; Table 3). Third year students knew more about the highest mortality globally annually from NCD compared to the First year (27.7% vs. 20.4%, p =0.04; Table 3).

Table 3. General knowledge or awareness about non-communicable diseases (*n* = 338).

Question	**Gender, n (%)**			**Degree Program, n (%)**					**Year of Study, n (%)**			
	M	**F**	**p-value**	**B.Ed.**	**B.Ed. in PE**	**B.Sc.**	**Others**	**p-value**	**Ist**	**2nd**	**3rd**	**p-value**
Heard about NCDs?												
Yes	96 (98.0)	236 (98.3)	0.5	214 (98.2)	51 (96.2)	50 (100.0)	17 (100.0)	0.4	108 (95.6)	113 (100.0)	111 (99.1)	**0.03**
No	2 (2.0)	4 (1.7)		4 (1.8)	2 (3.8)	0 (0.0)	0 (0.0)		5 (4.4)	0 (0.0)	1 (0.9)	
Are NCDs prevailing in Fiji?												
# Yes	90 (91.8)	236 (99.6)	**0.001**	211 (98.1)	51 (96.2)	48 (96.0)	16 (94.1)	0.8	104 (92.0)	113 (100.0)	113 (100.0)	**0.006**
No	6 (6.1)	1 (0.4)		2 (0.9)	2 (3.8)	2 (4.0)	1 (5.9)		7 (8.0)	0 (0.0)	0 (0.0)	
Do you believe that NCDs are now a global public health problem?												
# Yes	94 (95.9)	235 (97.9)	0.3	214 (98.2)	50 (94.3)	49 (98.0)	16 (94.1)	0.3	108 (95.6)	111 (98.2)	110 (98.2)	0.3
No	4 (4.1)	5 (2.1)		4 (1.8)	3 (5.7)	1 (2.0)	1 (5.9)		5 (4.4)	22 (1.8)	2 (1.8)	
Can we consider NCDs as "Lifestyle disease?												
# Yes	93 (94.9)	232 (96.7)	0.4	206 (94.5)	52 (98.1)	50 (100.0)	17 (100.0)	0.1	107 (94.7)	108 (95.6)	110 (98.2)	0.4
No	5 (5.1)	8 (3.3)		12 (5.5)	1 (1.9)	0 (0.0)	0 (0.0)		6 (5.3)	5 (4.4)	2 (1.8)	
Where do the majority of premature deaths from NCDs occur?												
Low-income countries	33 (33.7)	64 (26.7)	0.5	66 (30.3)	18 (34.0)	12 (24.0)	1 (5.9)	0.4	28 (24.8)	38 (33.6)	31 (27.7)	0.06
Middle-income countries	20 (20.4)	48 (20.0)		46 (21.1)	10 (18.9)	10 (20.0)	2 (11.8)		16 (14.2)	29 (25.7)	23 (20.5)	

High-income countries	15 (15.3)	42 (17.5)		37 (17.0)	8 (15.1)	8 (16.0)	4 (23.5)		27 (23.9)	13 (11.5)	17 (15.2)	
# Low-middle income countries	30 (30.6)	86 (35.8)		69 (31.6)	17 (32.1)	20 (40.0)	10 (58.8)		42 (37.2)	33 (29.2)	41 (36.6)	
NCD is responsible largely for the global burden												
Cardiovascular diseases	31 (31.6)	65 (27.3)	0.2	52 (24.1)	20 (37.7)	16 (32.0)	8 (47.1)	0.3	38 (33.9)	30 (26.5)	28 (25.2)	0.2
Cancer	23 (23.5)	43 (18.1)		45 (20.8)	10 (18.9)	10 (20.0)	1 (5.9)		23 (20.5)	26 (23.0)	17 (15.3)	
# Respiratory diseases	4 (4.1)	4 (1.7)		4 (1.9)	2 (3.8)	2 (4.0)	0 (0.0)		4 (3.6)	1 (0.9)	3 (2.7)	
Diabetes	40 (40.8)	126 (52.9)		115 (53.2)	21 (39.6)	22 (44.0)	8 (47.1)		47 (42.0)	56 (49.6)	63 (56.8)	
NCD is responsible for the highest mortality in Fiji												
Cardiovascular diseases	30 (30.6)	51 (21.3)	**0.005**	45 (20.6)	17 (32.1)	13 (26.0)	6 (35.3)	0.1	39 (34.5)	17 (15.0)	25 (22.3)	**.012**
Cancer	23 (23.5)	38 (15.8)		41 (18.8)	14 (26.4)	4 (8.0)	2 (11.8)		15 (13.3)	29 (25.7)	17 (15.2)	
Respiratory diseases	6 (6.1)	6 (2.5)		10 (4.6)	0 (0.0)	2 (4.0)	0 (0.0)		4 (3.5)	3 (2.7)	5 (4.5)	
# Diabetes	39 (39.8)	145 (60.4)		122 (66.3)	22 (12.0)	31 (16.8)	9 (4.9)		55 (48.7)	64 (56.6)	65 (58.0)	
How many people die globally annually from NCD												
15 million	43 (43.9)	126 (52.5)	0.4	100 (45.9)	38 (71.7)	22 (44.0)	9 (52.9)	**0.04**	60 (53.1)	63 (55.8)	46 (41.1)	**0.04**
25 million	33 (33.7)	68 (28.3)		70 (32.1)	8 (15.1)	17 (34.0)	6 (35.3)		30 (26.5)	36 (31.9)	35 (31.3)	
# 41 million	22 (22.4)	46 (19.2)		48 (22.0)	7 (13.2)	11 (22.0)	2 (11.8)		23 (20.4)	14 (12.4)	31 (27.7)	
NCD projected to cause the highest deaths by 2030?												

#Cardiovascular diseases	39 (39.8)	113 (47.5)	0.3	101 (46.8)	20 (37.7)	22 (44.0)	9 (52.9)	0.3	55 (49.1)	42 (37.5)	55 (49.1)	0.5
Cancers	38 (38.8)	82 (34.5)		74 (34.3)	24 (45.3)	18 (36.0)	4 (23.5)		39 (34.8)	47 (42.0)	34 (30.4)	
Chronic respiratory diseases	6 (6.1)	20 (8.4)		20 (9.3)	1 (1.9)	5 (10.0)	0 (0.0)		6 (5.4)	10 (8.9)	10 (8.9)	
Digestive diseases	15 (15.3)	23 (9.7)		21 (9.7)	8 (15.1)	5 (10.0)	4 (23.5)		12 (10.7)	13 (11.6)	13 (11.6)	
Which type of diabetes is the most common globally?												
Type 1	37 (38.1)	88 (37.0)	0.3	81 (37.5)	16 (30.2)	21 (42.9)	7 (41.2)	0.7	50 (44.6)	33 (29.5)	42 (37.8)	0.2
# Type 2	40 (41.2)	120 (50.4)		101 (46.8)	31 (58.5)	20 (40.8)	8 (47.1)		46 (41.1)	63 (56.3)	51 (45.9)	
Gestational	20 (20.6)	30 (12.6)		34 (15.7)	6 (11.3)	8 (16.3)	2 (11.8)		16 (14.3)	16 (14.3)	18 (16.2)	

Note: P values<0.05 are considered statistically significant; # Correct answer

Table 4. Knowledge or awareness about risk factors associated with non-communicable diseases (*n* = 338).

Question	Gender, n (%)			Degree Program, n (%)					Year of Study, n (%)			
	M	**F**	**p-value**	**B.Ed**	**B.Ed in PE**	**Bsc**	**Others**	**p-value**	**Ist**	**2nd**	**3rd**	**p-value**
Have you heard about the risk factors of NCDs?												
Yes	89 (90.8)	224 (93.3)	0.4	203 (93.1)	47 (88.7)	48 (96.0)	15 (88.2)	0.5	108 (95.6)	113 (100.0)	111 (99.1)	**0.03**
No	9 (9.2)	16 (6.7)		15 (6.9)	6 (11.3)	2 (4.0)	2 (11.8)		5 (4.4)	0 (0.0)	1(0.9)	
Can we consider NCDs as a key barrier to poverty alleviation and sustainable development?												
Yes	75 (76.5)	196 (82.4)	0.2	182 (83.9)	40 (75.5)	39 (79.6)	10 (58.8)	**0.06**	95 (84.1)	83 (74.8)	93 (83.0)	0.2
No	23 (23.5)	42 (17.6)		35 (16.1)	13 (24.5)	10 (20.4)	7 (41.2)		18 (15.9)	28 (25.2)	19 (17.0)	
Which of the following are modifiable risk factors for NCDs?												
Tobacco use	10 (10.3)	19 (8.1)	**<0.001**	15 (7.0)	8 (15.1)	5 (10.2)	1 (6.3)	0.4	9 (8.0)	10 (9.3)	10 (9.0)	0.9
Unhealthy diet	23 (23.7)	27 (11.5)		34 (15.9)	8 (15.1)	6 (12.2)	2 (12.5)		19 (16.8)	13 (12.0)	18 (16.2)	
Physical inactivity	11 (11.3)	10 (4.3)		12 (5.6)	7 (13.2)	2 (4.1)	0 (0.0)		8 (7.1)	8 (7.4)	5 (4.5)	
Alcohol abuse	6 (6.2)	7 (3.0)		9 (4.2)	2 (3.8)	2 (4.1)	0 (0.0)		3 (2.7)	6 (5.6)	4 (3.6)	
# All of the above	47 (48.5)	172 (73.2)		144 (67.3)	28 (52.8)	34 (69.4)	13 (81.3)		74 (65.5)	71 (65.7)	74 (66.7)	
Does physical activity help to prevent NCDs?												
# Yes	83 (85.6)	209 (87.8)	0.6	190 (87.6)	44 (83.0)	42 (85.7)	16 (100.0)	0.3	99 (88.4)	96 (85.7)	97 (87.4)	0.8
No	14 (14.4)	29 (12.2)		27 (12.4)	9 (17.0)	7 (14.3)	0 (0.0)		13 (11.6)	16 (14.3)	14 (12.6)	
Insufficient physical activity a risk factor for following diseases?												
Cardiovascular disease	22 (22.4)	29 (12.2)	0.2	28 (13.0)	13 (24.5)	7 (14.0)	3 (17.6)	**0.002**	29 (25.7)	9 (8.0)	13 (11.7)	**0.04**

Type 2 diabetes	7 (7.1)	20 (8.4)		11 (5.1)	10 (18.9)	6 (12.0)	0 (0.0)		10 (8.8)	9 (8.0)	8 (7.2)	
Cancer	5 (5.1)	10 (4.2)		10 (4.6)	5 (9.4)	0 (0.0)	0 (0.0)		4 (3.5)	6 (5.4)	5 (4.5)	
Obesity	26 (26.5)	80 (33.6)		72 (33.3)	10 (18.9)	20 (40.0)	4 (23.5)		29 (25.7)	39 (34.8)	38 (34.2)	
# All	38 (38.8)	99 (41.6)		95 (44.0)	15 (28.3)	17 (34.0)	10 (58.8)		41 (36.3)	49 (43.8)	47 (42.3)	
What is the WHO recommendation for physical activity among children and adolescents?												
# 60 minutes moderate to rigorous activity	73 (74.5)	184(76.3)	0.2	170 (78.0)	36 (67.9)	40 (80.0)	11 (64.7)	0.4	89 (78.8)	80 (70.8)	88 (78.6)	0.4
70 minutes moderate to rigorous activity	20 (20.4)	34 (14.2)		33 (15.1)	10 (18.9)	6 (12.0)	5 (29.4)		16 (14.2)	24 (21.2)	14 (12.5)	
80 minutes moderate to rigorous activity	5 (5.1)	22 (9.2)		15 (6.9)	7 (13.2)	4 (8.0)	1 (5.9)		8 (7.1)	9 (8.0)	10 (8.9)	
WHO recommended level of physical activity for 18+ years												
# 150 minutes/week	41 (41.8)	97 (40.4)	0.3	85 (39.0)	22 (41.5)	27 (54.0)	4 (23.5)	0.4	49 (43.4)	43 (38.1)	46 (41.1)	0.3
120 minutes/week	41 (41.8)	117 (48.8)		104 (47.7)	25 (47.2)	19 (38.0)	10 (58.8)		52 (46.0)	59 (52.2)	47 (42.0)	
160 minutes/week	16 (16.3)	26 (10.8)		29 (13.3)	6 (11.3)	4 (8.0)	3 (17.6)		12 (10.6)	11 (9.7)	19 (17.0)	
Does diet control help in preventing NCDs?												
# Yes	91 (92.9)	218 (90.8)	0.5	196 (89.9)	49 (92.5)	48 (96.0)	16 (94.1)	0.5	99 (87.6)	106 (93.8)	104 (92.9)	0.2
No	7 (7.1)	22 (9.2)		22 (10.1)	4 (7.5)	2 (4.0)	1 (5.9)		14 (12.4)	7 (6.2)	8 (7.1)	
Four behavioural risk factors causing high disease burden in Fiji												
Alcohol consumption	10 (10.2)	30 (12.7)	0.2	22 (10.2)	10 (18.9)	5 (10.2)	3 (17.6)	0.3	17 (15.0)	9 (8.2)	14 (12.5)	0.4

Diabetes	14 (14.3)	33 (13.9)		27 (12.5)	13 (24.5)	4 (8.2)	3 (17.6)		16 (14.2)	15 (13.6)	16 (14.3)	
Obesity	14 (14.3)	17 (7.2)		19 (8.8)	6 (11.3)	5 (10.2)	1 (5.9)		11 (9.7)	14 (12.7)	6 (5.4)	
High BP	9 (9.2)	15 (6.3)		16 (7.4)	4 (7.5)	3 (6.1)	1 (5.9)		10 (8.8)	5 (4.5)	9 (8.0)	
# All	51 (52.0)	142 (59.9)		132 (61.1)	20 (37.7)	32 (65.3)	9 (52.9)		59 (52.2)	67 (60.9)	67 (59.8)	
The most significant risk factor for cancer in general												
Unhealthy food	17 (17.3)	341 (14.2)	0.2	32 (14.7)	6 (11.3)	10 (20.0)	3 (17.6)	**0.02**	16 (14.2)	13 (11.5)	22 (19.6)	0.4
Alcohol	11 (11.2)	12 (5.0)		9 (4.1)	9 (17.0)	5 (10.0)	0 (0.0)		7 (6.2)	6 (5.3)	10 (8.9)	
Sunlight	2 (2.0)	8 (3.3)		5 (2.3)	4 (7.5)	1 (2.0)	0 (0.0)		3 (2.7)	4 (3.5)	3 (2.7)	
# Tobacco	29 (29.6)	71 (29.6)		71 (32.6)	16 (30.2)	8 (16.0)	5 (29.4)		40 (35.4)	35 (31.0)	25 (22.3)	
All	39 (39.8)	115 (47.9)		101 (46.3)	18 (34.0)	26 (52.0)	9 (52.9)		47 (41.6)	55 (48.7)	52 46.4)	

Note: a. Marginally significant; # Correct answer

DISCUSSION

The purpose of this study was to investigate the knowledge or awareness level of NCDs and their risk factors among university students. To our knowledge, this is the first study that explored the awareness of NCDs and their risk factors in university students in Fiji. Nevertheless, the rising numbers of NCDs have become a major problem in Fiji that needs to be addressed from all population subgroups. A multifaceted and sustainable approach is warranted to design and promote health awareness as addressing NCDs is a global priority [12]. In this study, participants reported that they first came to know about NCDs and their risk factors from their teachers followed by the social media. These findings underscore the need for integrating health literacy courses with the existing curriculum, in which health promotion messaging from teachers and social media can be utilized for the mass persuasion of the students [20,21]. Consistent with our findings, teachers' lectures were the most essential information sources for students to enhance their awareness about NCDs, according to another study conducted in Thailand and Malaysia [22,23].

We found that the overall knowledge or awareness of the study respondents was encouraging, however, the study also found that students were not having a fair idea about prevailing of NCDs in Fiji. It is surprising to note that after having 84% of the high burden of NCDs in Fiji's mortality rate, students are not having sufficient knowledge and awareness. This may be due to the lack of awareness camps and informative workshops being organized in the community. This finding was consistent with a study done by Kumar & Kaur in 2018 [11]. The knowledge of the respondents on insufficient physical activity as a risk factor of NCDs among different years and programs of study has experienced some pattern of differences, the probable reason for these results is related to study content and exposure to the awareness camps during their progression throughout the study program and year. This finding was supported by a study done by Onagbiye and colleagues [2], which indicated that the study's participants had little knowledge about physical activity, but lacked sufficient knowledge with regards to NCDs.

The growing NCD epidemic in low- and middle-income nations is posing a serious danger to progress toward sustainable development goals, particularly poverty reduction methods [2]. A majority of our participants also think that NCDs are key barriers to poverty alleviation and sustainable development. The important aspects of the government annual reports, which are routinely published in the press and also publicized through social media platforms, could be the explanation for participants' high understanding of this topic.

The results of this study also indicate that the respondents in this study had less awareness about the initiatives to prevent NCDs despite government or public health agencies' information campaigns. This issue needs to be addressed by the policymakers to laid down a strong awareness system. To control and preventing the risk factors of NCDs, Ministry of Health and Medical Services, Fiji implemented strategic plans [25]. The result of this study shows that one-half of the respondents (41.7%) were only aware of this important strategic plan. Only 43.2% of participants were able to see the NCDs awareness camp nearby their homes. The ministry can take the help of community members to make the awareness camps more visible for maximum outreach. Kumar & Kaur [1] have also suggested that vigorous outreach campaigns be conducted in communities and schools with parents as a targeted audience. In the wake of the WHO global action plan for NCD, several LMICs are making efforts to implement WHO recommendations to tackle the NCD burden [26]. This plan has drawn reasonable attention worldwide owing to its requirement to curb NCDs but this study results revealed that only 45.3% of respondents were aware of this action plan. The less awareness level may draw questions on the effectiveness of a strategic plan outreach to the community members. Needless to say, the results of this study are very supportive to re-designing the health promotion strategies to control NCDs and these findings can also be considered as the wake-up call for the design and development of a curricular plan which must be having the inclusion of the NCD's related matter.

Study limitations

This study is not without limitations. First, given the travel restrictions due to the COVID-19 pandemic, we were only able to recruit students from campuses of a single institution, which may obscure the generalization of results to other institutions in Fiji. Future large-scale and multi-centric studies can be planned to improve the representativeness of the sample and the external validity of the results. Second, owing to the cross-sectional nature of this study, causation, and temporality could not be assessed. Third, this study may be subject to language bias as students who understand English were only included. In addition, social desirability bias could occur, especially while reporting the practice of unhealthy behaviours by the students. Finally, the survey was not based on the theoretical constructs, which may limit inferencing. This highlights the need of developing survey instruments based on newer-generations theoretical frameworks with robust psychometric properties.

CONCLUSION

The role of students is noticeably extended in the education system where they can provide disease-related education to their families along with the communities and contributes to a reduction in the burden of NCDs in society. Students can contribute in different ways to forestall NCDs. For instance, they can use social media to provide a novel perspective on NCD prevention and control by sharing knowledge and information on key risk factors and interventions. The basic level of knowledge is essential to promote health-related behaviors and consequently reduce the burdens of NCDs. An important way to control NCDs is to focus on reducing the risk factors associated with NCDs.

Modifiable risk factors can be curbed through integrating NCDs-related education activities in the current curriculum that can improve the overall awareness among the students. Physical education should be offered as mandatory at the early school levels (primary and secondary), to promote physical activity behaviors. The Physical education teachers (PETs) are the real craftsmen, who can contribute to craft the future of a healthy nation by designing sports and physical activities, therefore, PETs empowerment and knowledge enrichment are also required to attend to deliver quality physical education program. A well-coordinated approach by health ministry and local health departments is also required to organize frequent camps in the educational institutions to spread the awareness related to NCDs.

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