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Knowledge, Attitude and Practices on Non-Communicable Diseases among Students and Staff at the Dar es Salaam University College of Education in Tanzania

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Abstract

Non-Communicable Diseases (NCDs) are among the major public health problems facing the world today. Despite contributing to over half of all deaths worldwide, and being a major challenge in low- and middle-income countries, NCDs have received less attention. In Tanzania, studies focusing on the assessment of comprehensive knowledge of NCDs are lacking. This study aims to assess knowledge, attitudes and behaviour of the Dar es Salaam University College of Education (DUCE) community on selected NCDs. A cross-sectional study was conducted to assess knowledge, attitudes and practices on selected NCDs. The study involved both students and staff at the DUCE. A descriptive analysis was adopted for the quantitative data collected through structured questionnaires. The study findings show that the general knowledge of the DUCE community about some selected NCDs was generally high. However, there was a very low level of knowledge about risk factors, early symptoms and preventive measures. Regarding risk factors, a very small proportion of students (1.6%) and staff (3.1%) consumed tobacco products. Only 75 (13.1%) of students and 70 (36.5%) of staff consumed alcohol. The intake of fruits and vegetables among the community was insufficient. About 493 (86%) of the students and 135 (70.3%) of the staff added salt or salty sauce to their meals. As for physical activities, 234 (40.8%) of the students and 99 (51.6%) of the staff reported that they ran or participated in games and sports for at least one day in a week. The study concludes that while generally there is a high level of knowledge about NCDs, there is a very low level of knowledge about risk factors, early symptoms and preventive measures. The study underlines the need to increase the awareness of the DUCE population on risk factors associated with NCDs, early signs and preventive measures that people should take to prevent NCDs in the future.

Keywords: *higher education, public health, diseases*, *HIV/AIDS, Tanzania*

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1. Introduction

Non-Communicable Diseases (NCDs) are among the major public health problems facing the world today. NCDs are most prevalent in low- and middle-income countries (LMICs), and the age-adjusted death rates from NCDs are nearly twice as high in LMICs as in high-income countries (Ngaruiya et al., 2022; WHO, 2018a). NCDs accounted for an estimated 36m deaths (63% of the 57m deaths) that occurred globally in 2008 (Alwan et al., 2010).

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The World Health Organization (WHO) projected that NCD deaths would increase by 15% globally between 2010 and 2020: from 36 to 44m deaths, and the highest increase was projected to occur in the African region (WHO, 2008).

According to the WHO NCDs Working Group Report, NCDs are now the leading cause of death in all regions of the world, including the sub-Saharan Africa (SSA). In LMICs, NCD-related deaths are projected to rise by over 50% by 2030. For SSA, it is projected that NCDs will be responsible for 46% of all deaths by 2030, increasing from 28% in 2008, thereby resulting in a 'double burden' of diseases; and further complicating health and development challenges (WHO, 2018a). In Tanzania, NCDs are estimated to account for 33% of the total deaths among adult population (WHO, 2016). The diseases have had significant effects on the population, including loss of manpower, unsatisfactory duty performance and increased costs of treatments.

The greatest burden of NCDs has been said to be from four major diseases: cardiovascular diseases, diabetes, cancer and chronic respiratory illnesses (WHO, 2018). These diseases share a set of four risk factors, which subsume the use of tobacco, unhealthy diets, harmful alcohol consumption and physical inactivity.

Like in many developing countries, the burden of NCDs in Tanzania has been increasing steadily (Mayige et al., 2012). A survey on the burden of NCD risk factors in Tanzania showed that the burden of diabetes and cardiovascular diseases was high, with the prevalence of hypertension estimated to be around 26% (MoH, 2012).

Even though the importance and magnitude of NCDs are increasing in Tanzania, there is limited data on the level of knowledge, attitude, and practice of NCDs among university communities. Most of the existing studies from other countries have been conducted among the general population. In addition, most of these studies have specifically focused on awareness and knowledge of a more specific type of NCDs such as hypertension and diabetes (Ibrahim et al., 2016; Abdul-Razak et al., 2016; Bashaar et al., 2019; Mwimo et al., 2021). Against this background, this study aims to assess knowledge, attitudes, practices and behaviours regarding selected NCDs among the Dar es Salaam University College of Education (DUCE) students and staff. Findings of the study may inform behaviour change and communication (BCC) activities, and enable the development of a comprehensive NCDs policy and prevention strategies.

2. Methods

2.1 Study Design and Settings

This was a cross-sectional study conducted among DUCE students and staff. Quantitative approach was used to assess knowledge, attitudes and practices of DUCE students and staff regarding selected NCDs.

2.2 Sampling and Sample Size

The sample size for the study was computed using the formula described in Daniel and Cross (2013). This formula is used to estimate a sample size when the population is known. The sample size was estimated separately for students and staff. Hence,

$$ss = \frac{P * X}{X + P - 1}$$

Where,

$$X = Z^2 \frac{(p)(1-p)}{MoE^2}$$

Margin error (MoE) = 4%
Population size = 5300 & 520
Confidence level = 95%
Sample proportion (p) = 50%
Level of Significance (α) = 5%
Z^2 =1.96

$$X = 1.96^2 \frac{(0.5)(1-0.5)}{0.04^2} = 600.25$$

(a) Estimated sample size for students (N =5300).

$$ss = \frac{5300 \times 600.25}{600.25 + 520 - 1} = 539.2762 = 540$$

(b) Estimated sample size for DUCE staff (N = 520)

$$ss = \frac{520 \times 600.25}{600.25 + 520 - 1} == 278.8742 = 279$$

Thus, the estimated sample size for 520 staff was 279.

2.3 Data Collection Tools

Data were collected by using structured questionnaires adapted and modified from Ithnin and colleagues (2018), and Zahorka and Stevenson (2016). Questions and statements in the questionnaire were arranged according to the objectives of the study. The questionnaire assessed knowledge, attitudes and practices regarding diet, tobacco use, consumption of alcohol, salt and sugar, as well as physical activity. The questionnaire also assessed respondents' knowledge of diabetes, cardiovascular diseases, raised blood pressure and chronic respiratory diseases. Questions required participants to select 'Yes' or 'No' options; and a correct response was given one (1) score; and a wrong answer was given zero (0) score. The mean score was computed to determine the overall knowledge of DUCE community regarding NCDs. Those who scored between the mean score and above were considered as having good knowledge, whereas those who scored below the mean score were categorized as poor in knowledge. In addition, questions examined respondents' knowledge on risk factors, disease management and preventive measures for major NCDs, namely cardiovascular diseases like stroke and hypertension, diabetes and chronic obstructive pulmonary diseases (COPDs). Respondents had to respond as 'Yes' or 'No', with an additional option for 'Unsure'.

Attitudes towards NCDs were assessed using a 2-point Likert scale; and the adopted scoring system was: Disagree = 0; and Agree = 1. Then, the mean score was calculated.

Those who scored between the mean score and above were considered as having positive attitudes, whereas those who scored below the mean score were categorized as having negative attitudes towards NCDs. In determining respondents' practices in relation to NCDs, the assessment focused on their physical exercises and activities, use of tobacco and alcohol, vegetable consumption, body weighing and stress management (Ithnin et al., 2018; Zahorka[SEP]& Stevenson, 2016). The response options were 'Frequent,' 'Sometimes,' and 'Never' for practices.

2.4 Data Management and Analysis

A descriptive analysis was adopted for the quantitative data collected through structured questionnaires. Accordingly, data was cleaned, coded, and then entered into a computer and exported into the SPSS, 21st version, for analysis. The findings were summarised and presented in terms of percentages and tables.

3. Findings

This section presents the key findings of the study in three major sub-sections. The first sub-section presents the key demographic characteristics of the staff and students involved in the study. The second sub-section presents findings on knowledge, attitudes and practices of DUCE staff and students regarding NCDs. The findings revolve around four major NCDs: diabetes, cardiovascular diseases, raised blood pressure (hypertension) and chronic respiratory diseases. The last sub-section presents findings on the risk factors associated with NCDs, namely: use of tobacco, alcohol consumption, diet, and physical exercises and activities.

3.1 Demographic Characteristics of Respondents

As indicated in Table 1, a total of 192 out of 279 DUCE staff participated in the study. The response rate for DUCE staff was 69% of the estimated sample size. Female respondents were relatively more (53.1%) than male respondents (46.9%). Age-wise, 41.1% of the staff were between 41 and 50 years. The number of administrative staff was comparatively higher (56.3%) than academic staff (43.8%). In terms of the level of education, more than one-third of the staff had Bachelor degrees; about a quarter (25%) had Masters degrees, and 14.1% had PhDs. Only 5.2% had qualifications below diploma level. Furthermore, as expected, more than three-quarters (77.1%) of the staff were married.

Table 1: Demographic Characteristics of DUCE Staff (N = 192)

Sex	Frequency	Valid Percent
Male	102	53.1
Female	90	46.9
Age		
20-30	30	15.6
31-40	71	37.0
41-50	79	41.1
51-60	12	6.3
Cadre		
Academic	84	43.8
Administrative	108	56.3

Level of education		
Certificate	10	5.2
Diploma	32	16.7
Bachelor Degree	75	39.1
Master Degree	48	25.0
Doctor of Philosophy (PhD)	27	14.1
Marital status		
Not married	38	19.8
Married	148	77.1
Divorced	1	0.5
Widow/Widower	5	2.6

As for students, Table 2 indicate that a total of 574 participated in the study. The response rate for DUCE students was 106% of the estimated sample size. The proportion of male students was relatively higher (65%) than that of female students (35%). As expected, the vast majority of students (73.3%) were between 20 and 24 years. In terms of programmes, 41.1% of the students were pursuing Bachelor of Arts with Education (B.A. Ed), followed by Bachelor of Education in Arts (B.Ed. Arts) (22.8%), and Bachelor of Education in Science (B.Ed. Science) (19.2%). As for the year of study, 38.2% of the students were in the first year, followed by second year (36.9%), and third year (24.9%).

Table 2: Demographic Characteristics of DUCE Students (N = 574)

Sex	Frequency	Valid Percent
Male	373	65.0
Female	201	35.0
Age		
15-19	3	0.5
20-24	421	73.3
25-29	126	22.0
30+	24	4.2
Degree Programme		
B.A. Ed	236	41.1
B.Ed. Arts	131	22.8
B.Ed. Science	110	19.2
B.Sc. Ed	94	16.4
Postgraduate Diploma/Masters	3	0.5
Year of Study		
First Year	219	38.2
Second Year	212	36.9
Third Year	143	24.9

3.2 Knowledge, Attitudes and Practices of DUCE Community Regarding NCDs

This section presents findings on knowledge, attitudes and practices of DUCE students and staff with regard to diabetes, raised blood pressure (hypertension), cardiovascular diseases and chronic respiratory diseases.

3.2.1 Diabetes

The findings revealed that the level of knowledge about diabetes in general was significantly high for both students and staff. Nearly all students (95.8%) and staff (99.5%) had heard about diabetes. However, knowledge about the risk factors associated with diabetes was below average (42.9%) for students, and average (50.7%) for staff. As indicated in Table 3, when respondents were asked to mention the risk factors that may lead to diabetes, the most five mentioned risk factors were: eating too much sugar, followed by family history, lack of exercises, too much fat, and being over-weight. Only 51 (5%) students and 18 (4.4%) staff could not mention even one risk factor.

Table 3: Knowledge about Risk Factors Associated with Diabetes

Risk factor	Students	Staff
Eating too much sugar	333 (32.7%)	95 (23.3%)
Family history	160 (15.7%)	56 (13.8%)
Lack of exercise	88 (8.6%)	48 (11.8%)
Eating too much fat	85 (8.3%)	47 (11.5%)
Over weight	60 (5.9%)	34 (8.4%)
Stress	55 (5.5%)	27 (6.6%)
Age over 40	54 (5.3%)	10 (2.5%)
Alcohol consumption	25 (2.5%)	18 (4.4%)
Smoking	7 (0.7%)	19 (4.7%)
Don't know	51 (5.0%)	18 (4.4%)

Both students and staff demonstrated low knowledge of early symptoms of diabetes. Specifically, the average score of knowledge levels for students and staff here were 31.6% and 37.6%, respectively. The most frequently mentioned symptoms were passing lots of urine, fatigue, losing weight, excessive thirst, and vision problems. Only 150 (17.1%) of students and 43 (13%) of staff could not mention any symptom associated with diabetes. Table 4 summarizes the responses.

Table 4: Knowledge About Early Symptoms of Diabetes

Early Symptoms of Diabetes	Students	Staff
Passing lots of urine	249 (28.5%)	97 (29.2%)
Fatigue	113 (12.9%)	73 (22%)
Losing weight	100 (11.4%)	31 (9.3%)
Excessive thirst	84 (9.6%)	31 (9.3%)
Vision problems	74 (8.5%)	16 (4.8%)
Loss of appetite	50 (5.7%)	13 (3.9%)
Others	40 (4.6%)	24 (7.2%)
Don't know	150 (17.1%)	43 (13%)

The knowledge about measures people could take to prevent diabetes was below average for both students (43.9%) and staff (49.3%). The most common preventive measures that respondents mentioned were physical activities, followed by limiting sugar intake, adopting healthy diets, regulating eating habits, weight loss, and limiting fatty foods (see Table 5). Only 60 (5.6%) of the students and 18 (4.5%) of the staff could not mention any single measure of preventing diabetes.

Table 5: Knowledge about Preventive Measures against Diabetes

Preventive measures against diabetes	Students	Staff
Physical exercises	301 (28.2%)	108 (27.2%)
Limiting sugar	286 (26.8%)	104 (26.2%)
Health diet/eating habits	154 (14.4%)	72 (18.1%)
Weight loss	66 (6.2%)	20 (5.0%)
Limiting fatty foods	61 (5.7%)	25 (6.3%)
Weight control	57 (5.3%)	24 (6.0%)
Health checks/screening	40 (3.7%)	9 (2.3%)
Don't know	60 (5.6%)	18 (4.5%)

As regards attitudes, the findings indicated that both students and staff had positive attitudes. The vast majority of students and staff believed that diabetic family members or friends should seek medical treatment. With regards to practices, 115 (20.8%) students and 135 (70.3%) staff reported that they had their blood sugar tested by a doctor or other health worker. Furthermore, more than two-thirds of students (64.6%) and 109 (56.8%) staff admitted that they did not have enough information about the problems associated with diabetes; and nearly all students (96.6%) and staff (99.0%) acknowledged that they would like to have more information about these problems.

3.2.2 Cardiovascular Diseases

Overall, the general knowledge level for cardiovascular diseases (CVDs) was high among the DUCE community. Specifically, more than two-thirds of the students (69.9%), and more than three-quarters of the staff (80.7%) had heard about CVDs. However, when respondents were asked to mention the specific CVDs they knew, 130 (30.6%) of the students and 27 (14.9%) of the staff could not mention any CVD, meaning that they had very low knowledge of CVDs. The most frequent mentioned CVDs were hypertension (30.4% for students and for 37% staff); followed by dilated heart (18.8% for students and 25.4% for staff); arrythmias (2.8% for students and 1.1% for staff); and blood vessel narrowing (coronary artery diseases) as mentioned by 7.2% of the staff and 0.5% of the students. Overall, knowledge on risk factors associated with CVDs was low for both students (39.5%) and staff (39.8%). When respondents were asked to mention the risk factors associated with CVDs, the most mentioned risks were eating too much fat, stress, being over-weight, lack of physical exercises and family history. Only 127 (12.2%) of the students and 26 (6.9%) of the staff could not mention even one risk factor. Table 6 further shows the findings.

Table 6: Knowledge about Risk Factors Associated with CVDs

Risk factors	Students	Staff
Eating too much fat	238 (22.9%)	89 (23.5%)
Stress	187 (18%)	76 (20.1%)
Over weight	93 (9%)	41 (10.8%)
Lack of physical exercises	93 (9%)	55 (14.6%)
Family history of CVDs	81 (7.8%)	18 (4.8%)
Using too much salt or salty food	64 (6.2%)	16 (4.2%)
Don't know	127 (12.2%)	26 (6.9%)

Similar to knowledge about risk factors, respondents had low knowledge about symptoms of CVDs. The average knowledge levels on the symptoms of CVDs were 30.7% and 35.7% for students and staff, respectively. As indicated in Table 7, the most frequently mentioned symptoms were the lack of breath during physical exercises, chest discomfort, getting exhausted easily, pains that spread to the arm, and irregular heartbeats. Only 218 (23.6%) of the students and 56 (17%) of the staff could not mention any early symptom associated with CVDs.

Table 7: Knowledge about Symptoms of CVDs

Symptoms	Students	Staff
Lack of breath during physical exercises	138 (15%)	52 (15.8%)
Chest discomfort	77 (8.4%)	40 (12.1%)
Getting exhausted easily	80 (8.7%)	31 (9.4%)
Pains that spread to the arm	38 (4.1%)	23 (7%)
Irregular heart beats	92 (10%)	27 (8.2%)
Sweating	54 (5.9%)	15 (4.5%)
Don't know	218 (23.6%)	56 (17%)

Furthermore, as for knowledge on risk factors and symptoms of CVDs, respondents had low knowledge about measures that people could take to prevent CVDs. The average score was 40.3% for students and 47.4% for staff. The most frequently mentioned preventive measures were physical exercises, healthy diet or eating habits, limiting fatty foods, weight control, weight loss and quitting alcohol consumption. Only 129 (12.3%) of the students and 28 (7.3%) of the staff could not mention any preventive measures against CVDs (See Table 8).

Table 8: Knowledge about Preventive Measures against CVDs

Preventive measures	Students	Staff
Physical exercises	348 (33%)	138 (35.8%)
Health diet or eating habits	129 (12.3%)	74 (19.2%)
Limiting fatty foods	144 (13.7%)	53 (13.8%)
Weight control	73 (6.9%)	17 (4.4%)
Weight loss	68 (6.5%)	28 (7.3%)
No alcohol consumption	47 (4.5%)	11 (2.9%)
No smoking	38 (3.6%)	11 (2.9%)
Don't Know	129 (12.3%)	28 (7.3%)

Similar to other diseases reported in this study, respondents had positive attitudes towards CVDs. Nearly all students (97.2%) and staff (99.5%) believed that diabetic family members or friends should seek medical treatment. However, the absolute majority of students (81.0%) and staff (74.5%) admitted that they had very limited information about the problems associated with CVDs. Therefore, nearly all students (97.6%) and staff (97.9%) were willing to get more information about the problems associated with CVDs.

3.2.3 Hypertension

The general knowledge about high blood pressure/hypertension was very high for both students and staff. For example, around 511 (89.0%) of the students and 189 (98.4%) of the

staff had heard about hypertension or raised blood pressure. However, knowledge about complications associated with hypertension was very low for both students (23.9%) and staff (30.1%). As indicated in Table 9, the most frequently mentioned complications were heart attack/stroke, health failure, atherosclerosis, memory loss or poor understanding, pains that spread to the arm, and blood vessel narrowing. Only 168 (23.4%) of the students and 53 (18.7%) of the staff could not mention any complication associated with hypertension.

Table 9: Knowledge about Complications Associated with Hypertension

Complications associated with hypertension	Students	Staff
Heart attack/stroke	186 (25.9%)	68 (23.9%)
Health failure	101 (14.1%)	35 (12.3%)
Atherosclerosis	50 (7.0%)	20 (7.0%)
Memory loss or poor understanding	44 (6.1%)	11 (3.9%)
Pains that spread to the arm	41 (5.7%)	13 (4.6%)
Eye blood vessel narrowing	41 (5.7%)	16 (5.6%)
Narrowing of blood vessels	34 (4.7%)	13 (4.6%)
Don't Know	168 (23.4%)	53 (18.7%)

Nearly half of the students 213 (41.7%), and more than three-quarters of the staff 153 (81.0%), who were aware of hypertension reported that they had their blood pressure measured by a health worker. About 216 (42.3%) of the students and 295 (57.7%) of the staff reported that they knew what to do if they have high blood pressure. However, 431 (84.3%) of the students and 138 (73.0%) of the staff declared that they had inadequate information about problems associated with hypertension: thus nearly all students 555 (96.7%) and staff 190 (99.0%) indicated that they would like to have more information about these problems.

3.2.4 Chronic Respiratory Diseases

Similar to other diseases analysed in this study, respondents had high level of general knowledge about chronic respiratory diseases (CRDs). The findings revealed that 539 (93.9%) students and 188 (97.9%) staff had heard of CRDs. However, similar to other diseases, the knowledge about risk factors associated with CRDs was low for both students (38.3%) and staff (37.8%). As indicated in Table 10, the most frequent risk factors mentioned by respondents were tobacco smoke, outdoor air pollutants, indoor air pollutants, allergens, second-hand tobacco smoke, and respiratory infections. Of the students, 84 (8.7%) could not mention any risk factor associated with CRDs, while the number for the staff in this category was 37 (11.3%).

Table 10: Knowledge about Risk Factors Associated with CRDs

Risk factors associated with CRDs	Students	Staff
Tobacco smoke	247 (25.6%)	78 (23.8%)
Outdoor air pollutants	139 (14.4%)	37 (11.3%)
Indoor air pollutants	122 (12.6%)	32 (9.8%)
Allergens	105 (10.9%)	35 (10.7%)
Second hand tobacco smoke	94 (9.7%)	14 (4.3%)
Respiratory infections	71 (7.4%)	21 (6.4%)
Don't Know	84 (8.7%)	37 (11.3%)

Similarly, knowledge about early symptoms of CRDs was low for both students (33%) and staff (32%). The most frequently mentioned symptoms of CRDs were difficult breathing, coughing for a month or longer, chronic mucus production, and wheezing or noisy breathing (See Table 11). Also, 60 (7.3%) students and 26 (9.6%) staff could not mention any early symptoms of CRDs.

Table 11: Knowledge about Early Symptoms of CRDs

Early symptoms of CRDs	Students	Staff
Difficult breathing	430 (52.1%)	156 (57.4%)
Cough for a month or longer	182 (22.1%)	55 (20.2%)
Chronic mucus production	96 (11.6%)	11 (4.0%)
Wheezing or noisy breathing	40 (4.8%)	13 (4.8%)
Others	17 (2.1%)	11 (4.0%)
Don't Know	60 (7.3%)	26 (9.6%)

Similar to knowledge about risk factors and symptoms of CRDs, respondents had low knowledge of preventive measures against CRDs. The average scores for students and staff were 29.2% and 27.8%, respectively. As indicated in Table 12, the most frequently mentioned preventive measures were quitting smoking, avoiding lung irritants, avoiding passive smoking and spending time in mountains. We note that 111 (14.2%) students and 57 (21%) staff did not know any preventive measure against CRDs.

Table 12: Knowledge about Preventive Measures against CRDs

Preventive measures against CRDs	Students	Staff
Quitting smoking	228 (29.1%)	68 (25.1%)
Avoiding lung irritants	206 (26.3%)	73 (26.9%)
Avoiding passive smoking	99 (12.6%)	20 (7.4%)
Spending time in mountains.	63 (8.8%)	14 (5.2%)
Other	76 (9.7%)	39 (14.4%)
Don't Know	111 (14.2%)	57 (21%)

With regard to attitudes, similar to other diseases reported in this study, respondents had positive attitudes towards CRD victims. For example, nearly all 534 (99.1%) students and 188 staff (100%), who were aware of CRDs, believed that people who contract CRDs should seek medical treatment. Similarly, more than half of the students (54.4%) and 59.6% of the staff were confident about what to do if they had symptoms of CRDs. However, the vast majority of the students (79.4%) and staff (71.3%) demonstrated inadequate information about the problems associated with CRDs. Similarly, nearly all students (96.7%) and staff (99.5%) admitted that they would like to get more information about the problems associated with CRDs.

3.3 Risk Factors Associated with NCDs

This sub-section presents findings on tobacco use, alcohol consumption, diet and physical activities among DUCE students and staff.

3.3.1 Tobacco Use

The findings revealed that only 9 (1.6%) of the students and 6 (3.1%) of the staff smoked tobacco products: the practice was relatively higher among staff than among students.

On average, respondents reported that they smoked around 2 tobacco products each day. Furthermore, 8 (57%) of the smokers reported that they smoked inside their houses. Furthermore, the findings revealed that 4 (66.7%%) staff and 4 (44.4%) student smokers had unsuccessfully tried to quit smoking in the past twelve (12) months.

3.3.2 Healthy Diets

Almost all students (99%) and staff (100%) reported that they took fruits and vegetables at least once per week. It was further reported that students and staff took fruits at the average of three (3) and six (6) days per week, respectively. As for vegetables, the findings revealed that students and staff took vegetables at the average of four (4) and five (5) days, respectively, in a typical week. Regarding salt and salty sauce, the findings revealed that 493 (86%) of the students and 135 (70.3%) of the staff added salt or salty sauce to their food. In addition, 473 (82.4%) of the students and 166 (86.4%) of the staff used salt or salty sauce in cooking in their households. Only 68 (11.8%) of the students and 63 (32.8%) of the staff reported that they did not consume soft drinks such as energy drinks, Fanta, Coca-Cola, and similar drinks. Similarly, only 49 (8.5%) of the students and 22 (11.5%) of the staff reported that they did not use sugar in their tea or coffee. Furthermore, one-third of the students (177 (30.8%)), and nearly half of the staff (91 (47.4%)) reported that they did not consume commercially baked food and snacks, as well as cakes, chocolates or biscuit; and 20 (3.5%) of the students and 12 (6.3%) of the staff did not consume fried foods.

3.3.3 Alcohol Consumption

The findings showed that only 75 (13.1%) students and more than one-third (36.5%) of the staff consumed alcohol such as beer, wine and spirits; with a significant difference between male (85%) and female (15%) students ($p=000$). However, there was no significant difference between male (59%) and female (41%) staff in alcohol consumption ($p=0.252$). In addition, 42 (56%) students and 44 (62.9%) staff who consumed alcohol reported that they had consumed alcohol in the past 30 days. Nevertheless, 14 (33.3%) students and 5 (11.4%) staff who consumed alcohol could not remember the number of days they had consumed alcohol in the past 30 days. Similarly, 18 (42.9%) students and 7 (15.9%) staff who had consumed alcohol in the past 30 days could not remember the average amount of alcohol they consumed in a typical day. It was further revealed that 34 (45.3%) students and 15 (21.4%) staff were willing to change their alcohol consumption patterns. The findings revealed that almost half of the students (47.3%) and 14 (20%) of the staff who consumed alcohol had alcohol-harmful behaviours. Moreover, the proportion of male students (83%) and staff (71%) who had harmful alcohol-drinking behaviours was higher than female respondents.

3.3.4 Physical Activities

The findings revealed that more than half of the students (60.1%) and 110 (57.3%) of the staff walked or rode bicycles for at least 10 minutes consecutively every day. There was a significant difference between male (76%) and female (24%) students ($p=000$); but there was no significant difference between male (59%) and female (41%) staff ($p=0.055$). In addition, 234 (40.8%) students and 99 (51.6%) staff reported that they participated in such games and sports such as football, netball or basketball; and others for at least one day in a typical week.

4. Discussion

This study was conducted to assess the level of knowledge, attitudes and practices related to some selected NCDs among staff and students at the DUCE. The general knowledge of the DUCE community about some selected NCDs was generally high, since 86.9% of the students and 94.1% of the staff had heard about some selected NCDs, namely diabetes, hypertension, cardiovascular diseases and chronic respiratory diseases. Similar findings have been reported elsewhere (Zahorka & Stevenson, 2016; Ithnin et al., 2020). For example, a study conducted among the general adult population in urban and rural Malaysia reported that more than half of the respondents showed good knowledge (78.7% vs 69.9%), good attitude (53.1% vs 93.2%), and moderate practice (63.8% vs 54.8%) (Ithnin et al., 2020). Likewise, several studies conducted in different countries on specific types of NCDs, such as hypertension and diabetes, also reported a good level of knowledge (Abdul-Razak et al., 2016; Muthukrishnan et al., 2018; Bashaar et al., 2019; Mwimo et al., 2021).

In this study, however, it is imperative to point out that knowledge about risk factors, early symptoms and necessary action required to be undertaken was low as attested by 39.5% of the students and 45.8% of the staff. The findings of this study imply that Tanzanians may be at the risk of unknowingly attracting these conditions, and thus being very late in seeking medical intervention when complications may have already developed. A study conducted among the general population in other settings also found out that respondents had high level of knowledge about NCDs; but very low level of knowledge about risk factors, early signs and preventive measures. It was only a very small portion of respondents in the study who felt that they were adequately informed about NCDs and associated problems (Zahorka & Stevenson, 2016).

This study also showed that risky behaviours for NCDs do exist among both students and staff. For example, 1.6% of the students and 3.1% of the staff were smoking tobacco products; 13.1% of the students and 36.5% of the staff use alcohol; of whom 25% had developed alcohol-harmful behaviours. A similar study conducted in almost similar settings reported higher rates of alcohol use (48.2%) and tobacco smoking (13.5%) among the University of Dodoma (UDOM) undergraduate students (Kileo, 2016). The magnitude of alcohol use among the DUCE community was slightly higher than a previously reported population-based survey (17.2%), which was conducted in September 2003 in Dar es Salaam (Mbatia et al., 2009). It is, however, noted that the smoking rate was lower in the DUCE community than in the general population, which was 14.1% in 2012 (MoH, 2012); and 13.1% among UDOM undergraduate students (Kileo, 2016). Variations in these rates may be attributed to the different study populations, and the period when these studies were conducted. All in all, it is important to point out that tobacco and excessive alcohol consumption contribute significantly to NCDs that could otherwise be prevented.

As for dietary issues, it was observed that the intake of fruits and vegetables was only 11.3% and 14.3% for students and staff, respectively. High intake of salt and fat was common among both students (86%) and staff (84.2%). The WHO recommends 400 grams of fruits and vegetables per day for the prevention of NCDs, as well as for the prevention and alleviation of several micronutrient deficiencies. It also recommends a low salt and low fat diet (WHO, 2014). The lack of compliance to the WHO and FAO recommendations may be attributed to insufficient knowledge on their importance, or financial constraints.

Furthermore, the study results have shown that a majority of the students (60.1%) and staff (57.3%) had active lifestyles; measured against the WHO recommendations. A recent study conducted in other settings in Tanzania reported that the vast majority (94.3%) of the participants were physically active; and most of it was contributed by work (70%) and transport-related (20%) activities (Mwimo et al., 2021). According to the WHO, adults should have at least 150 minutes of moderate-intensity physical activities or 75 minutes of vigorous-intensity activities in a week (WHO, 2018b). However, it is also true that a significant number of students and staff live a sedentary life, a lifestyle that is risky and predisposes one to NCDs. While it is difficult to explain why some community members are active while others are not, psychosocial and other cultural factors cannot be ignored.

As demonstrated in this study, even though knowledge and attitudes for both students and staff was generally satisfactory, practice remained low. Evidence elsewhere has demonstrated that increasing awareness and knowledge alone do not guarantee the modification of a behaviour (Ibrahim et al., 2016; Muthukrishnan et al., 2018; Ithnin et al., 2020). These findings underline the need to increase education on a healthy lifestyle and regular check-ups at all levels of the society.

5. Limitations of the Study

This study has some limitations worth mentioning. First, the study adopted a cross-sectional case study design, which does not allow for the determination of causal effect relationships. Secondly, it was conducted among university staff and students whose demographic and socio-economic characteristics, including education level, are quite different from those of the general population in Tanzania. Furthermore, the study used only quantitative methods: consequently, the findings were not complemented and triangulated with qualitative data.

6. Conclusions

While there was generally a high level of knowledge about NCDs among both students and staff, there was very low level of knowledge about risk factors, early symptoms and preventive measures among the DUCE community members. Additionally, the risky behaviours for NCDs do exist at the College. The findings of this study imply that the DUCE community may be at the risk of unknowingly attracting these conditions and seeking medical intervention late when complications may have already developed. It is, therefore, important to set up necessary interventions geared towards stepping up DUCE's responsiveness to NCDs.

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