SJIF Impact Factor: 3.458

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 3.
Issue: 3.
Page N. 41-49
Year: 2019

Original Article www.wjahr.com

PUBLIC HEALTH CONCERNS AND RISK PERCEPTIONS OF NONCOMMUNICABLE DISEASES AMONG UNDERGRADUATE FEMALE STUDENTS AT MAKERERE UNIVERSITY: A QUALITATIVE STUDY

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Received date: 30 March 2019 **Revised date:** 20 April 2019 **Accepted date:** 10 May 2019

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ABSTRACT

Noncommunicable diseases like cancer, diabetes, cardiovascular disease, and chronic respiratory diseases continue to pose significantly and disproportionally increasing health threats in low and middle income countries, perpetuated by social determinants of health among populations. There is emerging shift in the trend of occurrence and distribution of these chronic diseases within countries, not only by gender, socio-economic status, disability, ethnicity, but most recently by age- as higher proportions of all deaths due to noncommunicable diseases are occurring among individuals under the age of 70 years. Despite these important recent developments, it appears the problem remains a neglected public health issue that has not attracted equivalent attention, both among students and decision makers at Makerere University. We anticipate this situation is being maintained by insufficient empirical evidence due to limited research to that effect. We conducted a cross-sectional qualitative study aimed at gaining an in-depth understanding of the prevailing public health concerns, and risk perceptions of noncommunicable diseases among undergraduate female students at the Uganda's most famous and oldest public University. This, was through focus group interviews, of which the raw data was subjected to a combination of constant comparison analysis and content analysis methods for analysing qualitative data. Indeed, participants identified a wide array of perceived health threats as prevailing public health concerns, of which depression ranked top, followed by gastric ulcers, abortion and unwanted pregnancies. Relationships related social factors like breaking with boyfriends, valentine mood and sexual relationships with sugar daddies for money- emerged as dominant exposure risk factors to those conditions. While the four major noncommunicable diseases ranked relatively low, this does not in any way imply that their actual risk was low. Instead, participants argued that these chronic conditions take long to manifest, and even though, there was less social stigma attributed to them. These results are essential for informing targeting of public health education, and behavioural change interventions to mitigate risks associated with the scourge of noncommunicable diseases.

KEYWORDS: Noncommunicable diseases, risk perceptions, social determinant.

BACKGROUND

The prevalence of noncommunicable diseases (NCD), notably cancer, diabetes, cardiovascular disease, and chronic respiratory diseases- is surging globally, and their impact on public health is well known (Saha & Alleyne, 2018), as they caused an estimated 71% of all deaths in 2012 (WHO, 2014), up from 65.3% in 2010 (Lozano et al., 2012). These four major NCDs were responsible for about 82% all the case mortalities in 2012, according to the most recent WHO status report. Researchers predict that the burden of these chronic diseases will continue rising disproportionately among lower income countries and populations due to increasing lifestyle risk factors that most studies attribute to the socialization and acculturation effects of westernisation aka modernization.

Noncommunicable diseases are no longer just the scourge of the rich nor of the elderly. For instance, according to the WHO status report (WHO, 2014),

approximately 42% of all deaths due to these diseases-globally occurred before the age of seventy years, of which 82% were in low and middle income countries. This depicts an emerging shift in the trend of occurrence and distribution of these chronic diseases that are posing increased risks to younger and poorer populations worldwide. In Uganda, the probability of premature death between the age of thirty and seventy years reduced only slightly from 21.3% in 2010 to 21.2% (p.153) yet it remains comparatively higher than for her neighbouring States like Kenya, Rwanda and South Sudan. And, though premature death rates were significantly higher in males than females for most countries globally, there was only a small marginal difference of about 5.5% in Uganda (p.160)- implying that as nearly as many women (64.0%) as men (69.5%) die prematurely from these preventable lifestyle diseases.

Unlike emerging infectious diseases that have successfully attracted global attention and funding to that effect, NCDs remain marginalised yet they are foreseen to represent the greatest threats to global public health in the future (Jamison et al., 2013). This is largely because their root causes are mainly perpetuated by unequal conditions of social stratification, including socioeconomic status, gender, ethnicity, and disability (Marmot et al., 2008).

The link between NCDs and social determinants is becoming increasingly more apparent than ever before (Marmot & Bell, 2019), being impelled by effects of poverty and inequalities- of which gender inequality presents the most significant challenge (WHO, 2009) because it keeps women in a dangerous poverty trap. In fact the WHO (2011) cautions that poverty is risk factor for NCDs, and yet the disease outcome in turn may become a leading cause of poverty. Moreover, there is scientific evidence that the main risk factors for these chronic diseases are maintained through social norms and practices. These diseases are thus rooted in the social determinants of health (Marmot et al., 2008), as such, cannot be stopped through individual actions alone, but rather integrated approaches across all major areas of the society that shape the distribution of social conditions and main risk factors that influence health of populations.

Social determinants of health, according to Marmot et al. (2008) are simply ‘‘causes of the causes” of health inequality, and encompasses all unequal conditions in which people are born, grow, live, work, and age, and the inequities in power, money, and resources that give rise to them. These inequalities influence the distribution of advantages and opportunities in the society, in favour some against others. Moreover, the socio-economic benefits of prevention are more difficult to demonstrate to authorities and policy makers.

Identifying and mapping NCDs and their associated socio-behavioural root drivers are essential to inform the design of effective preventive measures that target multiple conditions simultaneously. Yet, it appears to have been a neglected public health issue at the Uganda’s oldest public University- Makerere, despite the institution being a regional research hub and an academic destination for several thousands of young people across the country and the region. The emerging new shift in the trend of occurrence and distribution of NCDs calls for an urgent need to re-focus socio-behavoral research, and generate empirical evidence that can be used to influence policy and decisions in favour of young people and women so as to be able to mitigate the associated risks, and prevent individuals from developing these preventable chronic lifestyle conditions. Fortunatley, there appears to be a unique window of opportunity to exploit- as studies reveal that adopting as few as only three preventative health behaviours (PHBs), without any other interventions, is capable of reducing health risks associated with any given NCD by up to 68% to 71% (Harrington et al., 2010). However, achieving this requires an understanding of the prevailing public health concerns, and risk perceptions aka beliefs (whether rational or irrational) held by an individual, a group or society about the chance of occurrence of a risk or about the extent, magnitude, and timing of its effect.

In the current study, we adopted some perspectives of socio-cognitive models to investigate the prevailing public health concerns and risk perceptions and associated socio-behavioural factors associated with one developing NCDs among undergraduate female students at Makerere University. Socio-cognitive models like the health belief model (Rosenstock, 1974; Witte, 1992) recognizes risk perception, also known as perceived risk or perceived threat to be a combination of perceived susceptibility and perceived severity. So, the expressions extent or magnitude as used in this article refers to severity of the problem, while ‘chance of occurrence’ is a measure of perceived susceptibility. By definition, perceived susceptibility is: *“one’s subjective perception of the risk of contracting a health condition”* (Rosenstock, Stretcher, & Becker, 1994, p.8). Whereby, subjective implies a judgemental process that depends on how the individual perceives the situation he or she is confronted with, hence our preference for a qualitative approach.

Susceptibility is considered a measure of risk attribute about a given health problem (Witte et al., 1996), and assumes that if the perceived risks are high, the individual is more likely to be compelled to take desired preventive actions. In contrast, perceived severity refers to feelings about seriousness and negative consequences, or an outcome of contracting an illness or a condition (Rosenstock, 1974; Rosenstock et al., 1994; Strecher et al., 1997) or if untreated includes evaluation of both medical and clinical consequences like pain, disability, impairment, handicapness, death or merely recovery, as well as possible social consequences like effects on work, family life and social relations. Witte (1992)

defines perceived severity as a person's belief about significance, magnitude, size, extent or degree of a health problem. In short, it is the perception of how serious the problem is if one were to contract it. The current study assumes that if individuals perceive the effects or consequences as severe, they are more likely to be compelled to take recommended beneficial actions.

It was envisioned that the knowledge from the current study would inform measures to enhance health promotion and adoption of multiple preventive health behaviors (PHBs) and improve health and well-being of undergraduate female students at the University.

METHODS

We conducted a cross-sectional qualitative study to understand the prevailing public health concerns and risk perceptions from the standpoint of its social relations. We adapted definitions, concepts, and understanding of risk perceptions from the health belief model that helps to explain health behaviours. We conducted six rigorous and in-depth focus groups on a sample of purposively selected resident undergraduate female students at Makerere University. The institution had a total enrolment of an estimated 36,000 undergraduate students, of which at least 45% were females. There were three on-compass halls of residence for undergraduate female students, from which study participants were drawn. None resident students were excluded from participating because they were not readily accessible. Besides, their social experiences outside the campus were anticipated to differ significantly from within the campus environment.

Two focus groups were held for each hall of residence, each comprising between 6-12 members who were selected purposively, ensuring as much diversity as possible in terms of year, course and time of study, as well as religious affiliations and age groups. This would ensure a fair representation of the prevailing social context. Evidence suggests that some social issues are better discussed by a small group of people who know each other (Glesne & Peshkin, 1992). During the interviews, participants sat around a circular table, and each had the chance to contribute to an on-going topic, passing to the next participant on the circle until relevant ideas had been exhausted, before the facilitators could move to the next issue on the interview guide. Participants and their corresponding responses were matched and referenced by their numbers without tagging personal identity information. For instance, $FG_1P_{(1\text{-}12)}$ represents participants one to twelve in focus group one; $FG_2P_{(1\text{-}12)}$ represents participants one to twelve in focus group two; while $FG_3P_{(1\text{-}12)}$ represents participants one to twelve in focus group three, and so on. This allowed attribution of anonymous verbatim statements to individual participants.

The interviews were moderated by a team of three experienced facilitators, trained by the lead researcher on the research protocol, including the focus group guide. One of them was a male, and two females. The lead facilitator was a Master graduate in Health Promotion. The second was a psychologist, while the third co-facilitator was a social scientist. However, transcription, including decoding audios and interpretation of results was done by the lead researcher.

Procedure wise, upon obtaining informed voluntary consent, participants were asked to identify arrange of preventable lifestyle diseases, illnesses, conditions and disorders they perceived as threatening to health and well-being of undergraduate female students at Makerere University. A proportional ranking was done to identify top six among the listed health threats. This, was achieved by distributing 100 counters equally to all participants in a focus group. And, the number of counters placed on a cell represents the corresponding level of social importance. A pairwise ranking of the top six most important health threats was then done. Further, the top six ranked health threats were mapped on a seasonal calendar to establish their patterns and trends across the calendar year. This was achieved by drawing a grid with months of year on X-axis against threats on Y-axis, and then distributed 100 counters equally among participants. The number of counters placed on a cell, reflected the corresponding level of health threat for that particular month. The last task involved identifying unhealthy practices that could lead to developing the top six health problems.

The data was analysed using a mix of constant comparison analysis and the classical content analysis methods for analysing qualitative data. The constant comparison analysis was developed by Glaser and Strauss (Glaser, 1978, 1992; Glaser & Strauss, 1967, Strauss, 1987) and was first used in grounded theory research to develop a summative big picture ‘‘theory’’ about a given social phenomenon (Glaser, 2008). It is a systematic analysis that goes through three stages - open coding, axial coding, and selective coding (Strauss & Corbia, 1998).

Whereas these steps do apply to content analysis as well, the key difference lies on the purpose of analysis. Content analysis aims to systematically analyze content of a given dataset without necessarily comparing between focus groups. It determines the frequency of occurrence of categories of codes among individual participants, within focus groups or all cases of a given incident (Morgan, 1997). Content analysis helps to establish if each participants used a given code, as opposed to whether each group used the code.

While applying these frameworks to the present study, the focus groups were used as the unit of analysis. First, the entire audio data was transcribed into written texts, and harmonized with field notes and observations, before starting to break it down into parts, and condensing the chunks into shorter statements without losing quality of

the original intended meaning. Since the raw data was not very large, manual open coding was done by identifying and labelling relevant pieces of data from the chunk of the raw data. Related codes on emergent issues, perceptions, views, opinions, and proposed solutions were then sorted and grouped into categories whose corresponding frequencies were determined for each focus group, and ranked to establish most common social issues or problems of public health importance. The results were presented in the form of a frequency distribution table. Finally, the analysis involved looking at essence (underlying meaning of the codes), frequency and sequence of occurrence of a given code, and then subgrouping codes that make reference to a specific concept.

RESULTS AND DISCUSSIONS

Participants

We present on **Table 1** below, the socio-demographic distribution of focus groups participants. All participants were undergraduate female students, and resident in either of the three on-campus halls (Africa, Marry Stuart or Complex hall).

Table 1: Socio-demographic characteristics of participants.

Characteristic		Frequency	Percentage (%)
Hall of Residence	Africa	17	31.5
	Complex	18	33.3
	Mary Stuart	19	35.2
Age Group	18-24	48	88.9
	25yrs+	6	11.1
Religious Affiliation	Roman Catholic	16	29.6
	Pentecostal	8	14.8
	Anglican	18	33.3
	Moslem	6	11.1
	Seventh-day Adventist	6	11.1
Education Level	Undergraduate Degree	51	94.4
	Undergraduate Diploma	3	5.6
Course Category	Arts	38	70.3
	Sciences	16	29.7
Programme of Study	Day	25	46.3
	Evening	23	42.6
	Weekend	6	11.1
Year of Study	New Entrants (year1)	19	35.2
	Continuing students	16	29.6
	Final year students	19	35.2
	Source: primary data		

Just about 89% of all the participants were of the age 18 to 24 years, but with substantial mix within each focus group, with respect to religious affiliations, educational level, and the programme, year and course of study. Student Guild leaders were not part of the focus groups because pre-test participants expressed fear of speaking freely in presence of their leaders. Three of the focus groups had eight participants each, two had eleven whilst one had ten participants. Only two participants dropped out amidst the on-going discussions, while none declined to participate, and no one else participated in the discussions besides the invited target participants and the facilitators. First, we conducted one focus group per hall, but since new relevant ideas were still emerging, additional one was conducted- making it two focus groups per hall, and six in total. At that point, no incremental new ideas were emerging. In fact, most focus groups often exceed one, but seldom three or four (Stewart & Shamdasani, 2015) per target subgroup. Krueger and Casey (2000) and Morgan (1997) elucidate that just between three to six focus groups are adequate to reach data saturation and/or theoretical saturation, with each group meeting once or more times depending on complexity of the research topic.

Perceived heath threats and associated risk factors

Participants identified array of perceived health threats, and ranked them in order of perceived social importance, with respect to extent of perceived severity and susceptibility. **Table 2** presents only those threats that were ranked among top six. Participants then discussed the socio-behavioural risk factors associated with occurrence and distribution of the top six health threats- giving reasons for the attributed ranks.

Table 2: Emergent Perceived health threats from the focus groups.

S.No.	Category	How many focus groups ranked a given threat among top six?	Cumulative Frequency***
1	Lung cancer	1	1
2	Depression	6	15
3	Gastric ulcers	4	11
4	Suicidal thoughts	2	1
5	Accident related Injuries and Disabilities	2	5
6	GIT Cancer	1	4
7	Obesity	2	2
8	Social phobia (Social Anxiety Disorder)	1	4
9	Abortion	5	10
10	Unwanted Pregnancy/pregnancy scares	5	10
11	Diabetes	2	1
12	Gender Based Violence (GBV)	1	1
13	Breast Cancer	1	3
14	Skin Cancer	1	2
15	Contraceptives overuse	2	5
16	Cross-generational sex	2	6
17	High Blood Pressure (HBP)	1	4
18	Cervical Cancer	3	5

***Total counts of tallies from pairwise ranking, from all the six focus groups. The maximum expected tally from each focus group is 15. Hence, the summation of all tallies from all six focus groups would be 90.

Depression was ranked among top six perceived health threat across all focus groups. Likewise, it had the highest cumulative frequency. Recently, in an article published by Stephen Nuwagira in September 2018, he argued that depression had become a silent killer at the University. While the article was not peer reviewed, earlier publications point to the same (Ovuga, Boardman & Wasserman, 2008) as they reported a prevalence rate of 16.2% at the campus. However, higher depression rates of up to 44%, and suicidal behaviour rate of 18% were reported from other Universities across the world (Nogueira-Martins et al., 2004), which may suggest that the problem might be coming a global health issue among university students.

Among the risk factors for depression identified by the focus groups, majority of them were relationships related. The participants identified social issues like break up with a boyfriend, pregnancy scares, unwanted pregnancies, fear of abortion and its associated outcome, rejection by friends, sex for marks, cross generational relationships, and gender based violence (GBV). This result poses a question for possible further research, to examine if relationships is indeed the main cause of depression among female students at the University. For instance, a participant lamented that, *''because he pays your tuition or else, the blesser becomes a serious distress (P_5FG_2), he calls you every time now and then, even during lectures, he wants to control every aspect of your life (P_3FG_2)''.* According to the participants, a blesser is a slung used by the girls to refer to a sugar daddy- provides immediate monetary needs, and as such is viewed a blessing or a saviour.

Further to that, because gastric ulcers, unwanted pregnancies and abortion often emerged from discussions about depression, they too ranked high, each scoring at least 10 tallies. Additional risk factors for depression, according to the participants include sudden death of tuition provider, poor examination results, examination stress that stems from lack of adequate preparations, too many course works and assignments, missing marks and financial distress. The diversity of associated risks underpin the multifactorial nature of causes and forms of depression, which reveals the complexity of the problem. While gastric ulcers emerged as one of the possible immediate effects of depression, most focus groups also attributed it to poor diets, as evident from some of the verbatim statements presented below.

The University stopped providing us food in the halls of residences (P_1FG_1), they give us only 4,500 Uganda shillings per day to meet the costs of breakfast, lunch and dinner (P_8FG_1). Yet, most female students come from humble family backgrounds (P_7FG_2). Considering the high cost of living around campus and the city, where does a student get good food for that amount (P_2FG_1)? Worse, we don't have a canteen in our hall, it got burnt (P_2FG_2). Female students living in our hall have to walk distances to look for food (P_3FG_2). Moreover, the stairs are not friendly (P_5FG_2). Because of all these difficulties, we are forced to forgo some meals or eat unhealthy foods, thus causing us ulcers ($P_{11}FG_2$). The unhealthy fast foods are in-turn high risks for constipation and obesity (P_1FG_1) as well as diabetes and other nutrition related disorders ($P_{11}FG_{2,3}$).

The 4,500 Uganda shillings was equivalent to about 1.5 US dollars, and is paid as food allowance to government sponsored students at the University. Previously, the University used not to pay food allowance as it was providing the students cooked meals at their respective halls of residences. It was a common view among participants whether the new food policy was critically looked at with a nutrition lens.

Cancers (of the lungs, breasts, skins, cervix & GIT), though identified as posing health risks, ranked relatively low. However, this might not suggest that they were not a problem, but were perceived to be less threating because their signs and symptoms take long to manifest. Some participants argued that most of the environmental risks associated with those NCDs were beyond their individual control, thus contributing to the low scores. For instance the participants asked, *''how does the University regulate passive smoking, even if I am not an active smoker (P_3FG_5)?''. ''What about in the night clubs and bars we hangout in (P_6FG_4), and in the junk foods that we eat on a more daily basis ($P_{11}FG_2$)?''*. Nonetheless, this its self may be suggestive of an attitudinal problem. Evidence reveals that it is not uncommon for people to portion blames about their inaction and improver PHBs.

With respect to skin cancer, the associated health risks factors included use of skin bleaching cosmetics as a result of pressure to fit in the society. Both the verbs over and high were used by the participants to describe extent of use of the cosmetics, and the driving forces for the use. Moreover they expressed concerns about quality of products used by most girls. Apparently, many of them use poor quality counterfeit cosmetics since they lacked the money to buy good ones. They were concerned that some of these chemicals besides posing risks of skin cancer, could affect their eye sights, *''but because we don't see the immediate effects, we continue to use them and perceive them to be low health threats (P_3FG_4)''*.

Diabetes ranked even less than the Cancers. In most focus groups, diabetes was only listed after follow-up probing questions. The participants still felt that diabetes is a disease of elderly persons, as such most of them had less health risks for developing it. Notwithstanding, there is evidence that age predisposition of diabetes is changing. An on-going study (Abbasi, 2012) in the United States has reported alarming increasing incidence of both type 1 and type 2 diabetes among youth younger than twenty years. It is important that health promotion creates awareness about this emerging shift in occurrence and distribution of diabetes before the problem escalates among young people whose lifestyles pose significant risks for these conditions. Not only those, but participants also argued that most of them came from humble family backgrounds, and face challenges adjusting and fitting to campus life. The risks of them suffering from social phobia was underscored, as evident in some of the verbatim statements below.

It starts right from how you dress, the hair style, the class of friends you associate with, the high school you come from, the phones that you use, to other basic items and needs (P_1FG_6). Female students from poor family background face this problem when they come to the University (P_5FG_6). We face a lot of social pressure, and in the end live the life that is literally not our selves (P_4FGD_4). In fact, I must say that most girls at the University here live in self-denial (P_7FG_1).

The language tone expressed in those statements intends to convey a message about the magnitude of the challenge, the social pressure that new joining students go through to adapt to campus lifestyles. Such kind of pressure in-turn predisposes female students to several health risks, and hinder uptake and adoption of PHBs. Social phobia, also called social anxiety disorder (SAD) is an intense anxiety or fear of being judged, negatively evaluated, or rejected in a social or performance situation.

The risks associated with violence against women and girls emanates from social perceptions of a female, and their expected stereotype roles in the society. The participants assent that because they are considered a weaker sex and aware of complex needs of a woman, their male counterparts take advantage to manipulate them. They attest that many girls are raped by their boyfriends, while others sustain physical and psychological injuries. Another less visible form of GBV, according to some participants occurs during students' electoral campaigns as revealed by the verbatim statements below.

"The ground is not level, the male students subject us to conditions that they know we are afraid to do as females (P_8FG_1). They will use vulgar language, touch-touch you, demand that you dance or that you offer them money. These create fear that tend to keep off female students from participating in potentially healthy activities, including physical exercise (P_7FG_6)''

Finally, the risks associated with accident related injuries and disabilities were multiple but mostly attributed to drug addictions, more so alcohol abuse. The participants also identified excitements and social events as a possible risk factor for female students getting involved in road accidents because most of such social events involve the students travelling outside the University premises. they named night clubbing, attending friends' parties, and visiting boyfriends and blessers as examples of social events that often take female students outside the University.

While most of these health risks did not exhibit seasonal attribution, the RED cells on Table 3 below represent hotspots for some of health risks, and these have been explained by some of the verbatim statements that follow right after the chart.

Table 3: Seasonal calendar for identified health threats.

Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lung cancer												
Stress/Depression												
Ulcers												
Suicidal thoughts												
Accidents												
GIT Cancer												
Obesity												
Social Anxiety Disorder												
Abortion												
Unwanted Pregnancy												
Diabetes												
Gender Based Violence												
Breast Cancer												
Skin Cancer												
Contraceptives overuse												
Cross-generational sex												
High Blood Pressure (BHP)												
Cervical Cancer												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**

During the black month of Nov, at the end of the semester, most girls have no money and food (P_2FG_6). As a result, girls are attempted to resort to blessers (P_5FG_4). In the end, they get involved in unprotected sex, leading to excessive use of emergency pills in fear of unwanted pregnancies. Moreover, there are end of year examinations during this same month of November! The aftermath spills over to Dec and Jan, worse, if your name is missing in the graduation list ($P_2FG_{3,5}$). These explain why the risks of stress, depression, HBP, contraceptives overuse, unwanted pregnancies, cross-generational sex, and abortion are comparatively higher in Nov.

It was a common view that Nov was a high risk month, and participants called it a black month to imply danger. Blessers, as used by the participants infers to sugar daddies. They are well-to-do usually older men who are willing to support or spend lavishly on the students. They buy for them expensive presents, and/or give money to them in exchange for time and sex. The Feb and Mar hotspots were attributed to excitements from Valentine Day (VD) and its aftermaths. Some of the verbatim statements below explain the problem associated with these months at the campus.

Most girls visit or hangout with their boyfriends on VD. There are many risks associated with this excitement, some drink and lose control of themselves. They could end up getting involved in road accidents or fights (P_3FG_1). Others engage in unprotected sex by consent, rape or lured into sexual intercourse. Breakups are not unusual, as most boyfriends have multiple relationships. The end result is stress, depression or to resort to the sugar daddy for a consolation. Those who get involved in unprotected sex could get unwanted pregnancies or overuse emergency pills due to pregnancy fears. The unlucky ones who get pregnant, often attempt to terminate the pregnancy because the cost of abortion is much cheaper than raising the baby (P_9FG_2), and moreover there is fear of public opinion (P_7FG_5). The social stigma associated with unwanted pregnancy is high. You will think of committing suicide. What will the people in my village say when they learn that I got pregnant from campus (P_5FG_6)? What will my parents say (P_2FG_6)? Your blood pressure will rise, and you will get painful ulcers due to stress and loss of appetite to eat food (P_1FG_4).

The hotspots observed in May were attributed to end of semester exams, the stress of which participants attributed to lack of adequate preparations, and Aug to new joiners as can be illustrated by some of the verbatim statements below.

Freshers are new entrants, year one students. They are still new to the university so are prone to several health threats, more-so ulcers because of sudden change of diets (P_8FG_1) and the desire to slim, lose the weight from the long vacation and build campus figure ($P_{10}FG_2$,). They are prone to SAD due to different family backgrounds (P_5FG_6). Some of us come from very remote families, we real struggle to fit to campus social life ($P_{11}FG_3$). They are at risk of being lured into sexual intercourse, as they get exposed to the social freedom at campus ($P_1FG_{4,6}$). Others look to the sugar daddies to give them money for luxury shopping, which their parents couldn't afford (P_3FG_3).

While discussions on the Aug hotspots were closely linked to new joiners, there were some views that the problem spills over to continuing female students as well. To expound this viewpoint, some participants narrated that continuing female students often felt unsafe

about their boyfriends when new joiners report, that there was increased risk of breakups due to desire to start new relationships. Knowledge of these hotspots should help inform targeted health education. Health camps should be provided at the campus to provide free health education, voluntary screening and counselling of students in order to mitigate some of these risks.

CONCLUSIONS

The present study was able to identify a range of prevailing public health concerns, of which depression was most dominant perceived health risk, followed by gastric ulcers, abortion and unwanted pregnancies- in that order of social importance, and mapped seasonal trends as to when perceived risks were considered to be higher. Further, socio-behavioural factors and unhealthy behaviours associated with these risks were identified. While the four major NCDs scored relatively low in terms of perceive risks, this may not in any way imply that their actual risks were low- but rather suggests a knowledge gap in recognizing the social importance of these chronic conditions, the fact that their clinical signs and presentations take long to manifest. These results are essential for informing targeting of public health education, and behavioural change interventions to mitigate risks associated with the scourge of NCDs.

DECLARATIONS

Ethical approvals and consent

The research proposal was initially vetted by the Texila American University School of Public Health, after which it was reviewed and approved by the Makerere University College of Health Sciences Ethical Review Committee **(Ref, 2018-033)**. Further approval was obtained from the Uganda National Council of Science and Technology (UNCST) - **Ref, HS229ES**. These measures were aimed at ensuring that the study was fully compliant with the basic ethical principles of research (Beauchamp & Childress, 2013) and the Uganda National guidelines for involving human participants in social research (UNCST, 2014). Informed consent was obtained from participants, including permission to publish the data on peer reviewed open access journals. The consent form used was reviewed and approved by the research ethics committee and the UNCST as an annex to the main research protocol.

Availability of data and materials

The audio datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

STA, JK and JKA contributed to study design and implementation, and data analysis. STA drafted the manuscript that was critically reviewed by JK and JKA. All authors read and approved the final version before it submitted for publishing.

Competing interests

The authors declares that they have no competing interests in the current research.

Funding

The current study was co-funded by the lead researcher and supported by Texila American University, which assigned a supervisor to the researcher, as well as reviewed the research protocols, including data collection tools, and thereafter granted initial approval to conduct the study.

Acknowledgements

The authors would like to thank the study participants for their time and contribution to this study. Appreciation is also extended to the research assistants, Benedict Twinomugisha, Ronah Tumukunde and Maria Ansiimire for the support they provided during data collection.

Authors' information

It may be important for readers to note that the corresponding author as well as the co-authors were graduates from Makerere University, and may be quite familiar with the social contexts. The corresponding was PhD student in Public Health. Holds MSc (one health discipline) from the University of Edinburgh, and Master of Management Studies (project planning and management) obtained from Uganda Management Institute, Kampala. At the time of the current study, he had been working in West Africa, specifically on multisectoral public health programming in the International Non-government Organization sector- with focus on health behavioural change. JK was a senior lecturer at College of Health Sciences, Makerere University and a visiting professor, with PhD in Anthropology- Development studies (women). JKA is a sports scientist and public health nutritionist, with Master degree in public health nutrition.

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