

PERCEIVED BARRIERS AND FACILITATORS TO UNDERGRADUATE FEMALE STUDENTS' ADOPTION OF MULTIPLE PREVENTIVE HEALTH BEHAVIOURS AGAINST NONCOMMUNICABLE DISEASES- MAKERERE UNIVERSITY.

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Received date: 20 April 2019

Revised date: 10 May 2019

Accepted date: 31 May 2019

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ABSTRACT

Despite public health benefits that researchers attribute to multiple preventive health behaviours, more remains unknown than known about how to optimize multiple preventive health behaviour change to mitigate health risks associated with noncommunicable diseases, which currently present major public health concerns, and represent the greatest global health security threats in the future. Yet, uptake and adoption of multiple preventive health behaviours continues to be unpredictable, which calls for replication of empirical studies on the attributed perceived barriers and facilitators, in view of increasing acceptability. We conducted a cross-sectional study on a random sample of 381 undergraduate female students at Makerere University in Uganda, to identify perceptions of barriers and facilitators to adoption of multiple preventive health behaviours against noncommunicable diseases. Respondents were categorized as Doers (practicing all the three desired actions) as opposed to Non-Doers (none or less than three of the actions). Data from the self-administered structured questionnaires were subjected to Chi-Square statistical test of significance. And, supplemented with six focus group interviews. Results suggest that two perceived barriers were statistically significant: *'my boyfriend or spouse just doesn't give me the safe space I need to try something by my own (p= .002)*, and *'my religious affiliation prohibits me from participating in some health-promoting activities (p= .045)'*. These results suggest that Non-Doers were likely not to adopt multiple preventive health behaviours than Doers, as a result of relationships and religion related perceived barriers. Moreover, another relationship related barrier *'my friends and peers just don't give me the safe space I need to try something by my own (p= .083)'* was close to being statistically significant. The focus groups helped to explain some of these findings. The study contributes to body of knowledge on multiple health behaviors and the emerging concept of healthy Universities, and recommends that future health promotions and messaging should adopt gender transformative approaches that engage both female and male students, and take advantage of religious places of worship and leaders to channel change messages. These results have policy implications towards achieving a healthy university and the World Health Organization's Global action plan for prevention and control of noncommunicable diseases.

KEYWORDS: Noncommunicable diseases, preventive health behaviour, perceived barriers, cues to action, Makerere University.

BACKGROUND

Preventive health behaviours (PHBs), according to Kasl and Cobb (1966) are actions undertaken voluntarily by apparently healthy persons, for the purpose of preventing disease or detecting illness at the earliest possible asymptomatic stage, and differs from the illness behaviour or sick-role behaviour described by the same

authors. Despite its importance in promoting behavioral change and harnessing the goals of public health, PHB research has received less consideration than other forms of health behaviours.

Yet, many researchers worldwide suggest that lifestyle behaviours of the sick, healthy, and at risk populations

tend to be highly clustered, findings that were upheld by Meader *et al.* (2016) in their systematic review on the clustering and co-occurrence of multiple health risk behaviours and their predictors, as well as by more recent empirical studies such as by Champion *et al.* (2018) and de Souza Dantas *et al.* (2018) among Australian and Brazilian youths respectively.

Henceforth, if such clustered unhealthy behaviours and their drivers are known, they can be addressed simultaneously (Spring, Moller & Coons, 2012) rather than one at a time sequentially, and so allow public health to enjoy the benefits associated with integrated approaches and economies of scope (Marmot *et al.*, 2019) - and thus presents a possible strategy for reducing the bottlenecks that constrain efforts on elimination of major noncommunicable diseases (NCDs). But, Spring *et al.* (2012) was concerned that more remains unknown than known about how to optimize multiple PHB change at the individual or the population level, which calls for further research, if public health is to combat the scourge of NCDs.

Noncommunicable diseases like cancer, diabetes, cardiovascular disease, and chronic respiratory diseases currently present a major public health concern globally, and represent the greatest threats to global health security in the future (Jamison *et al.*, 2013; Saha & Alleyne, 2018). Their prevalence continues to persist, and to surge globally, and yet disproportionately among low and middle income countries, as well as within populations in any single country (Lozano *et al.*, 2012; WHO, 2014). An estimated 71% of all deaths in 2012 (WHO, 2014) were attributed to NCDs alone, which represents increase of about 5.7% in just a period of two years (Lozano *et al.*, 2010).

The four major NCDs mentioned above were responsible for about 82% of all the case mortalities in 2012 (WHO, 2014), and are no longer a problem of the rich nor of the elderly only. At least some 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, according to the 2014 World Health Organization's status report on NCDs. Moreover the role of gender inequality in perpetuating the menace of these chronic diseases is not questionable (Marmot *et al.*, 2008; WHO, 2009). These trends depict an emerging shift in the epidemiology of these chronic diseases that are posing increased public health risks to younger people 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% (WHO, 2014) yet it remains comparatively higher than for her neighboring States like Kenya, Rwanda and South Sudan. And, though premature death rates were significantly higher in males than females for most countries worldwide, 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.

These observations justify the need to understand perceived barriers and facilitators to the uptake and adoption of PHBs against these preventable lifestyle diseases. Moreover, studies have shown that the concept of barrier perceptions is often highly contextual and variant among populations- in some instance, a barrier to healthy behaviours is a facilitator, and vice versa. We adopted the health belief model (Hochbaum, 1958; Rosenstock, 1974) to identify and analyze perceived barriers and facilitators aka cues to action- to the uptake and adoption of multiple PHBs by undergraduate female students at Makerere University. The health belief model (HBM) first evolved following attempts by researchers to explain why there were low attendance to free tuberculosis screening programme in the United States, but has since become the most widely used conceptual framework in health behaviour research and interventions (Champion & Skinner, 2008). These authors define perceived barriers as an individuals' beliefs about the tangible, and psychological costs of undertaking beneficial healthy actions. Studies on perceived barriers explore the factors or bottle necks that impede people from taking desired actions, even though they might be aware of health threats from a given unhealthy behaviour and the benefits associated with taking recommended actions.

In the current study, we consider perceived barriers to be the socio-structural factors, albeit social determinants of health (Marmot *et al.*, 2008) that impede the undergraduate female students from adopting a combination of health-promoting behaviours, despite being aware of the potential health threats associated with not taking desired preventive health actions. This definition links assessment of perceived barriers to assessment of knowledge about perceived benefits and perceived health threats, which we undertook in the recent study (Asaku, Kiguli & Agaba, 2019a) about public health concerns and risk perceptions of the undergraduate female students.

It is important to note that scientists have categorized health barriers broadly into three groups; availability, accessibility and acceptability (Boltana *et al.*, 2012; Chen & Hou, 2017; Sibley & Glazier, 2009). In the study by Boltana *et al.* (2012), acceptability related factors dominated with over 70%, followed by availability (16%) and accessibility (15%). Chen and Hou (2017) reported similar order of importance. The implications of this to public health is that availability of, and accessibility to health services does not necessarily translate in utilization- due to acceptability related barriers.

Availability barriers relate to presence and timeless (Chen & Hou, 2017) and include barriers like protracted

waiting time (Chen & Hou, 2017; Gibson, Kovach, & Lupfer, 2015), and tangible or physical availability or unavailability of services:- not available when required and not available in the area (Chen & Hou, 2017; Gibson et al., 2015). Accessibility factors include direct costs (Afolabi et al., 2013; Gibson et al., 2015; Marmot, 2017), transportation and competing needs (Chen & Hou, 2017; Marmot, 2017) as well as lack of sense of social support (Gibson et al., 2015). While, acceptability on the other hand relates to attitudinal factors like prejudice (Marmot et al., 2008; Sibley & Glazier, 2009), low quality, cultural incompetence, the perception that one is too busy, having negative attitude towards health workers, and language limitations (Chen & Hou, 2017) among others. Additional acceptability fear perceptions and beliefs expressed by Ugandan women (Hasahya et al., 2016) include fear of pain, fear of likelihood of being discriminated by peers, the fear of engaging with opposite sex and unfriendly health workers, and fear of anticipated negative side effects of treatment.

Like perceived barriers, cues to action are often highly contextual, yet they continue to be the least studied construct in the HBM (Strecher et al., 1997). Some researchers argue that little is still known about cues and their relative impact on PHBs because the construct has not been identified clearly in research. By definition, cues to action are internal or external (Janz & Becker, 1984) determinants of behavioral change triggers, albeit facilitators to the uptake and adoption of desired health behaviours. They are potential strategies to activate readiness (Champion & Skinner, 2008). No study had examined these factors in the context of the present study. The issue of multiple PHB research, and its associated barriers and facilitators of adoption remains a neglected public health concern in Uganda, and in particular at Makerere University. Our recent article

(Asaku, Kiguli & Agaba, 2019b) reported the associations between subject characteristics and adoption of multiple PHBs, but not the barriers and cues to action. The current article presents findings to that effect.

MATERIALS AND METHODS

We conducted a cross-sectional study, triangulating quantitative and qualitative methods and instruments, to identify perceived barriers and facilitators to the uptake and adoption of PHBs against NCDs. The study targeted 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 the undergraduate female students. We considered each of these halls as a stratum, with the assumption of high between stratum heterogeneity and low within stratum homogeneity, and so applied the stratified random sampling method. We adopted stratified sampling because it permits a fair representation of views of respondents across all subgroups unlike cluster sampling that concentrates a study in only a few subgroups (Amin, 2005). None resident students were excluded from the study because they would not be accessed readily.

The study sample size ($n= 384$, at 95% confidence level) was calculated using the formula adopted from Mugenda and Mugenda (2003), and Charan and Biswas (2013) for cross-sectional studies, and on the assumption that 50% of the target population exhibits the desired behaviours- we assumed the maximum because there was no reliable yardstick data on adoption of PHBs by young people in Uganda, and in particular the context of the current study. The method of proportional sample size allocation, whose results have been included on

Table 1- was adopted to allocate the study sample across the three strata.

Table 1: Sample size allocation by halls of residence.

Female Hall of residence	Stratum size	Number of rooms	Students-Room ratio	Sample Size	Number of rooms sampled
Africa Hall	$N_1= 498$	198	2.515	$n_1= 121$	61
Mary Stuart Hall	$N_2= 556$	298	1.866	$n_2= 135$	68
Complex Hall	$N_3= 530$	252	2.103	$n_3= 128$	64
Total	$N= 1,584$	748	2.117	$n= 384$	193

Source of secondary data on stratum size: Makerere University Planning and Development Department (2016).

The three female halls of residence constituted the sampling units for the current study, while the dwellers were the sampling elements that make up the sampling frame drawn from the list of room numbers. All undergraduate female students residing in those halls in the 2018/2019 academic year, irrespective of their year, course or time of study were eligible to participate. Undergraduate, as used in this article refers to students pursuing various Bachelor degree, Diploma and Certificate courses- irrespective of year of study.

The simple random lottery sampling method was used to select survey respondents from within each stratum. There were just above two dwellers per room on average. The questionnaire was administered to either (not both) of the students in the sampled rooms. Paper-based structured questionnaire with a set of pre-coded closed-ended fixed alternative questions (FAQs) was used, and were self-administered. The research assistants delivered the questionnaires to the target respondents, and returned

the following day to collect completed questionnaires. Some extra five questionnaires were provided per stratum to cater for lost to follow-ups and those that would be deemed invalid. The questionnaire was pre-tested and adjusted for validity and reliability. We obtained an adjusted mean content validity index (CVI) of .97, and reliability of .79 and internal consistency aka Cronbach's coefficient alpha ($\alpha=.92$), which were generally above the recommended thresholds for epidemiological surveys.

Similar to the previous study on subject characteristics (Asaku, Kiguli & Agaba, 2019b), we operationalized and measured PHBs in terms of three dimensions: 1) often/very often voluntary physician visit or contact with health facility in last six month- as was measured by a 4-point unbalanced Likert scale; 2) voluntary screening for at least one NCD (breast cancer, cervical cancer, other cancer types, obesity and/or high blood pressure) in last six month prior to the study- measured by the yes/no dichotomous scale; and 3) often/very often engaging in at least one physical activity (PA), also measured by a 4-point unbalanced Likert scale. Respondents were characterized into Doers and Non-Doers.

By way of definition, Doers (the YES category) refers to those respondents who exhibited all the three desired PHBs in the previous six calendar months prior to the study- precisely: 1) screened for at least one of the listed target NCDs; 2) had at least one physician contact; and 3) often/very often spent their leisure time outside class on at least one of the listed physical activities. Respondents who had none or less than three of these desired bundled behaviours were categorized as Non-Doers (the NO category respondents).

Raw data was entered in EpiData, edited, and some variables transformed before it was exported to StataSE and subjected to the Chi-Square (χ^2) statistical test whose corresponding p-values represent a measure of significance of probability of being a Doer (Doer outcome), at 95% confidence level. The p-values of less than .05 suggested a statistical significance.

We supplemented the quantitative data with six rigorous in-depth focus group interviews, two per stratum. The focus groups comprised 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. During the interviews, participants were arranged around a circular table, and each had the chance to contribute to on-going topic, passing to the next participant until relevant ideas had been exhausted, before the facilitators moved to 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}^[1-12] represents participants one to twelve

in focus group one; FG_{2P}^[1-12] represents participants one to twelve in focus group two; while FG_{3P}^[1-12] 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. The lead facilitator was a male and a Master graduate in Health Promotion. While, the two co-facilitators were females, one being a psychologist and the other a social scientist. Transcription, including decoding audios and interpretation of results was done by the lead researcher.

The procedures followed to collect and analyze qualitative data are similar to those reported in the earlier study on public health concerns and risk perceptions (Asaku, Kiguli & Agaba, 2019a). Briefly, upon obtaining informed voluntary consents, participants were asked to identify and rank perceived barriers to the uptake and adoption of PHBs against the listed NCDs. A proportional ranking of the identified perceived barriers was done to identify top six barriers that participants considered to be most important bottlenecks to adopting multiple PHBs. 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 barriers was then done. The same procedure applied to perceived cues to action.

The qualitative data from focus groups was analyzed using a mix of constant comparison analysis and the classical content analysis methods for analyzing 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 (Glaser, 2008) to develop a summative big picture "theory" about a given social phenomenon. 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 current 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

Three questionnaires were excluded from statistical analysis because they were incomplete. The results presented hereafter, therefore, are based on 381 respondents, disaggregated by stratum with corresponding response rates as shown on **Table 2**, and an overall valid response rate of 99.2%, which was above recommended thresholds for epidemiological cross-sectional surveys. All the descriptive statistics presented on this paper were based on actual number of valid responses to corresponding items.

Table 2: Proportions and response rates by stratum.

Stratum	Number of valid questionnaires	Percentage (%)	Response Rate (%)
Africa hall	119	31.2	98.3
Mary Stuart hall	128	33.4	94.8
Complex hall	134	35.2	104.7
	381	100	99.2

Detailed analysis of participants' demographic characteristics have been presented in our article on subject characteristics (Asaku, Kiguli & Agaba, 2019b). But briefly, 91.6% of survey respondents were aged between 18-24 years, 96.6% were pursuing undergraduate degrees, 72.7% were pursuing Arts courses, and just about equal proportion of respondents were day (49.3%) and evening (49.1) students. Of the total respondents, 42.8% were new entrants (year1 students), 11.3% were continuing students, while 45.9% were students in their final year of study. With respect to religious affiliation, the Anglicans dominated with 33.9%, followed by the Roman Catholic (29.4%), Pentecostal (13.9%), Moslem (10.2%), Seventh-day Adventist (1.8%) and others constituted the remaining 10.8%.

These demographic characteristics were considered when selecting focus group participants, to achieve a fair representation of the target population, and yet creating an environment that permit free interactions among the participants, and with the facilitators. As such, student leaders were excluded from participating in the focus groups because pre-test participants expressed fear expressing their views in presence of their leaders. 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. Three focus groups had eight participants each, two had eleven whilst one had ten participants. Further details about focus group participants can be accessed from Asaku, Kiguli and Agaba (2019a).

Perceived barriers to the adoption of multiple PHBs

Among the 381 survey respondents, up to 82.8% were categorized as Non-Doers, as compared to only 17.2% Doers. This was unexpectedly on a lower side, considering the benefits associated with multiple PHBs. These results might be explained by the perceived barriers, as readers will find elaborated in the sections that follow hereafter. Studies have revealed that adopting as few as only three 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). Behavioural change scientists must take advantage of this finding to promote the uptake and adoption of multiple PHBs.

The perceptions of Doers and Non-Doers with respect to barriers to uptake and adoption of multiple PHBs were summarized on **Table 3**, with the corresponding Chi-Square (χ^2) p-values as measures of statistical significance of the probability of Doer outcome.

Table 3: Perceived Barriers, Survey Data.

VARIABLE	Percentage of Respondents				χ^2 P-value
	Strongly Disagree	Disagree	Agree	Strongly Agree	
1. I believe that treating NCDs is more effective and easier than the efforts required to prevent them (N=342)					
Doers (n=59)	22.04	23.73	33.9	20.33	0.152
Non-Doers (n=283)	35.69	24.73	24.03	15.55	

2. My course is too demanding to allow time for trying something else for my life (N=346)					
Doers (n=58)	15.52	46.55	34.48	3.45	0.282
Non-Doers (n=279)	21.51	8.96	42.65	26.88	
3. As a student, I don't have the money it requires to adopt HPBs (perceived access barrier) (N=337)					
Doers (n=59)	6.78	35.59	37.29	20.34	0.183
Non-Doers (n=278)	15.83	27.34	41.37	15.46	
4. My friends and peers just don't give me the safe space I need to try something by my own (N=335)					
Doers (n=59)	18.64	54.24	22.03	5.09	0.083
Non-Doers (n=276)	33.7	40.58	17.75	7.97	
5. My boyfriend or spouse just doesn't give me the safe space I need to try something by my own (N=333)					
Doers (n=59)	20.34	61.02	16.95	1.69	0.002
Non-Doers (n=274)	39.05	38.69	13.14	9.12	
6. Even when health services are free or subsidized, waiting time at the 7. Mak's Hospital keeps me off from seeking routine medical help (N=330)					
Doers (n=57)	10.53	24.56	42.10	22.81	0.236
Non-Doers (n=273)	17.58	21.25	31.13	30.04	
8. I fear to know my health status because my friends, spouse etc., may reject me (N=333)					
Doers (n=58)	31.03	48.28	13.79	6.9	0.140
Non-Doers (n=275)	42.55	32.36	15.64	9.45	
9. I am equally as happy to be examined by a male health worker as female one (N=322)					
Doers (n=57)	7.02	24.56	45.61	22.81	0.518
Non-Doers (n=265)	13.96	21.13	41.13	23.78	
10. I am equally as happy to be examined by a younger health worker as an elderly one (N=325)					
Doers (n=56)	5.36	35.71	42.86	16.07	0.167
Non-Doers (n=269)	16.36	27.51	39.78	16.35	
11. I trust the Quality of health services at the Mak's Hospital (N=313)					
Doers (n=55)	12.73	32.73	47.27	7.27	0.183
Non-Doers (n=258)	18.6	24.42	41.09	15.89	
12. The way I dress at Makerere University (Mak) compass is just how safe and happy I feel (N=317)					
Doers (n=56)	7.14	14.29	42.86	35.71	0.513
Non-Doers (n=261)	6.90	9.96	37.16	45.98	
13. Mak's Health&Protection policies are good enough to make me feel safe and try something else that promotes health and well-being (N=327)					
Doers (n=57)	12.28	22.81	43.86	21.05	0.932
Non-Doers (n=270)	14.81	24.44	40.00	20.75	
14. Mak's Infrastructure &recreational services are sensitive enough to health needs and well-being of female students (N=329)					
Doers (n=59)	13.56	23.73	52.54	10.17	0.256
Non-Doers (n=270)	15.19	27.04	39.63	18.14	
15. My religious affiliation prohibits me from participating in some health-promoting activities at Makerere University (N=342)					
Doers (n=59)	35.59	38.98	20.34	5.09	0.045
Non-Doers (n=283)	51.94	28.62	11.31	8.13	

These results suggest that two perceived barriers were statistically significant: “my boyfriend or spouse just doesn't give me the safe space I need to try something by my own ($p = .002$), and “my religious affiliation prohibits me from participating in some health-

promoting activities at Makerere University ($p = .045$)”. The results suggest that Non-Doers were likely not to adopt multiple PHBs than Doers, as a result of relationships and religion related perceived barriers. Moreover, another relationship related barrier “my

friends and peers just don't give me the safe space I need to try something by my own ($p = .083$)'' was close to becoming statistically significant. The role of boyfriends in influencing uptake and adoption of multiple PHBs was expounded by the focus groups, in which participants explained that they approved or disapproved some actions. This has been discussed to more details in the later paragraphs of this article.

Further, although statistically insignificant, about equal proportions of Doers (64.9%) and Non-Doers (61.2%) agree/strongly agree that waiting time at the Makerere University Hospital keeps them off from seeking routine healthcare help from the facility. Protracted waiting time is a commonly reported accessibility barrier (Chen & Hou, 2017; Gibson, Kovach, & Lupfer, 2015) in

healthcare seeking behavioral research. This barrier may help to explain the low utilization rate of health services at the University Hospital, as students prefer alternative sources of healthcare help despite the services being subsidized or free of charge Asaku, Kiguli and Agaba (2019b).

Generally, there were more diverse array of perceived barriers from to focus groups than were tested by the survey. As such, some of barriers that emerged from the focus groups were not among those tested by the survey. For instance, nutrition related barriers and delayed onset of signs and symptoms. Further quantitative studies may be required to test the statistical significance of these emergent perceived barriers. We grouped the emergent perceived barriers into 14 categories shown on

Table 4.

Table 4: Perceived Barriers, from the Focus Groups' Perspective.

	Category	How many focus groups ranked a given barrier among top six?	Cumulative Frequency ^{***}
1	Delayed signs and symptoms	1	3
2	Knowledge barriers: Ignorance, unawareness, lack of exposure, poor reading cultures	6	18
3	Addictions: Alcohol abuse, cigarettes smoking and other drugs addictions	1	2
4	Financial Barriers: Inadequate funds, domestic poverty, family background, high cost of living	6	13
5	Personal Attitude: Laziness, negligence procrastination	5	12
6	Lifestyles: Luxury, extravagancy, desire for class of living, greed for money	2	6
7	Nutritional: lack of affordable food centers	2	1
8	Personal Resilience: self-confidence, self-esteem, perseverance, competing priorities	2	3
9	Peer pressure/influence	2	7
10	Emotional: Fear of pain, fear of failure or knowing status	2	6
11	Role Expectations: fear of public opinion, social proof, social phobia, fear of being embarrassed, social norms, values	3	4
12	Policy Environment: Unsupportive, ineffective policies, curfews	5	4
13	Poor Quality: Long waiting time, shortage of drugs, unfriendly health workers, limited accessibility of essential services	1	6
14	Boyfriends (they insist)	2	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.

Overall, we noted that there was a significant difference in the nature of barriers in the current study as compared to those reported from illness and sick-role behavioral studies, and were categorized broadly under availability, accessibility and acceptability barriers. For instance, we could not readily decide where drug addictions belong under those three categories. Other barriers like policy environment- cut across the categories. These observations suggest that barriers for PHBs are not necessarily the same as for other forms of health behaviours, as such upholds the need to replicate PHB

research in order the address real public health concerns in their local contexts.

Delayed onset of signs and symptoms was perceived as the major limiting factor to uptake and adoption PHBs against the Cancerous diseases. Because the clinical symptoms for these chronic conditions do not manifest till after a long period of time, individuals tend to assume that they are healthy and forget their importance.

The lack of appropriate knowledge about NCDs was a dominant barrier perception among all focus groups,

with cumulative frequency of 18 tallies. Encyclopedia defines knowledge as familiarity, awareness, or understanding of someone or something, such as facts, information, descriptions, or skills, which is acquired through experience, association, or education by perceiving, discovering or learning. Elements of this definition are manifest in verbatim statements from the focus groups, as evident below.

Most of us come from rural settings, with limited exposures and awareness, from conservative societies, families, cultures and religions (P₃FG₆). We don't get the chance to explore social issues around us (P₇FG₆). Moreover, most high schools tend to focus on teaching students to pass exams than the real life issues we live in (P₄FG₃). We realize we really don't know, when we reach campus where there is utmost freedom, yet you are again absorbed in fear (P₄FG₆). In the end, one doesn't take desired actions out of the ignorance (P₇FG₆).

While participants were quick to enlist perceived health risks public health concerns around them Asaku, Kiguli and Agaba (2019a), it follows that their knowledge of these NCDs was a limiting factor to taking desired preventive actions. Indeed, a systematic review of barriers and facilitators of behaviour change (Kelly et al., 2016) accentuated the role of knowledge. If individuals lack appropriate knowledge, they are likely to be unaware of the benefits associated with PHBs. As such, they will have lukewarm motivation and incentives to go through the stages of health behaviour change successfully. These results affirm those from the survey whereby nearly 40% of Non-Doers agree/strongly agree that treating NCDs was more effective and easier than the efforts required to prevent them. The corresponding proportion was even higher among Doers, though could be a result of the fact that the number of Doers was significantly less- which translates in higher proportions per unit increase. These results imply that public health promotion should put significant efforts on breaking knowledge barriers by creating awareness, if it is to achieve the goal of health for all.

Financial constraints ranked second, having emerged from all the focus groups as an accessibility barrier, with a cumulative frequency of 13 tallies. Specific issues here include; inadequate funds, domestic poverty, poor family backgrounds and high costs of living. Apparently, this barrier was the main incentive for engaging with blessers alias saviors, despite being aware of the health risks associated with the act (Asaku, Kiguli & Agaba, 2019a). The concern about parents not doing just enough to support their daughters was a heated contentious debate as part of the reasons advanced for inadequate funds. *“Once you came under government sponsorships, parents think you are covered (P₁FG₆), yet the government pays just less than two dollars for a day's meal!”*, a participant lamented. Indeed, financial costs as

a barrier to behavioral change is widely reported (Kelly et al., 2016) more-so in low income countries.

Among the recommendations from some of the focus groups, was the need for the University to provide students with alternative means of accessing finances. *“We argue the University administration through the student guild to introduce student saving schemes or rather student SACCOs to offer students loans at low interest rates (P₄FG₁)”*. Others suggested opportunities for part time employment.

Further, personal attitudinal attributes like laziness and negligence ranked third, appearing in five of the focus groups, and with cumulative frequency of 12 tallies. It was nearly a consensus that most campus girls were lazy, and preferred sedentary lifestyles like sleeping, watching television, browsing the internet, and chatting on social media (Asaku, Kiguli & Agaba, 2019a) to the more beneficial physical activities like sports, games and exercises. *“They will rather starve than walk to buy food (P₂FG₂)”*. And, *“because of laziness, they will keep procrastinating instead of taking actions (P₄FG₁)*. The role of negative attitude as an acceptability barrier to behaviour change was highlighted by Kelly et al. (2016).

Furthermore, the focus groups suggest that personal resilience, precisely the level of self-confidence, self-esteem, and the ability to persevere was an important barrier too as manifest in some of the verbatim statements. *“Sometimes, the male students subject us to practices and conditions that female students are shy to bear, more-so during times for campaigns when we visit their halls, one may have the confidence to try but going-on becomes challenging (P₈FG₁)”*. This statement underpins the importance of perseverance in maintaining behaviour change. An individual may have the confidence to take desired action, but due to lack of perseverance, the likelihood of relapsing will be high. The ability to persevere is a requisite requirement for maintaining health behaviour change, most of which come with multiple setbacks.

With respect to institutional policy, heated discussions centered on curfews, which Wikipedia refers to as an order specifying a time during which certain regulations apply. In the context of this study, participants implied the time when they were required to return to and stay in their resident rooms as revealed in some of the verbatim statements below.

“Due to fear of confronting security personnel, female students who get caught up by time were more likely to spend a night outside their rooms than their male counterparts (P₈FG₁). While it's a positive well intended policy, the unintended effects on those who fail to comply with time is problematic (P₄FG₅)”.

Apparently, entrance to the University halls of residence were locked at Midnight, as well as the University main

gate. Unfortunately, issues of security of others are most times difficult to compromise, and often personal compliance is part of the protocol. So, participants found it difficult to arrive at agreeable positions whenever the issue of curfews emerged. Some participants suggested that female halls should be manned by only female security officers, yet others did disagree. But, the proposal to increase presence of female security staff at the University gates was a consensus, on grounds that it would reduce fear among female students- if they ought to return to the University at night. However, this research did not establish the ratio of female to male security officers, but suggests the University administration to look on this matter, as well as consider increasing awareness among students on the importance of personal security.

The other existing policy that participants felt the University should strengthen is the Makerere University policy on sexual harassment prevention that was approved in 2006. Some participants claimed that until recently, the implementation of the policy was weak and mired by controversies, more-so the issue of students getting involved in sexual relationships with teaching staff, in return for good marks.

The third barrier that was closely linked to institutional policy was the lack of affordable food centers. It was quite an emotional topic, affecting participants from Mary Stuart hall most as they explained that the canteen at their hall was burnt down and had since not been re-activated (Asaku, Kiguli & Agaba, 2019a). Others lamented that the former famous kikumi-kikumi no longer existed at campus. Kikumi is a local dialect to mean one hundred since food joints at these locations were previously cheap, costing one hundred shillings per unit. Escalation of food prices at Kikumi-Kikumi could have negative implications on nutrition of female students, as they no longer have alternative means of obtaining nutritious foods at affordable costs.

Further, role expectation barriers that emerged from the focus groups include fear of public opinion, social approvers, social phobia, and fear of being embarrassed in front of other people. Participants assent to the role of societal context and cultural norms in influencing health behaviours. That, by virtue of gender and status, there are ascribed and achieved roles that members of the society expect from them. *“Simple things like how much food you eat, what you eat, how you dress, behave, talk and appear do matter here (P₇FG₅), which creates unnecessary social pressure to us female students, as we seek to impress others and struggle to fit into the society (P₄FG₂).*

By using the expressions “simple, yet do matter”, the participants ought to stress the extent of the problem faced by female students, with respect to role expectations. They intended to convey the message that they live under constant watch and expectations from

their friends, peers, family members and other members of the society. The question as to who approves or disapproves a desired action becomes the essence of the discussion here. Participants revealed that sometimes their friends or boyfriends approve or disapprove their actions, which sometimes creates negative effects on personal ability and willingness to try different ways of doing things. They will tend to stick to approvable actions, some of which are unfounded societal myths, which in-turn perpetuates unhealthy behaviours.

For instance, a significant number of participants said that some female students fear engaging in rigorous physical activities because their boyfriends disapproved that they would become muscular and look mannish. Another issue that emerged was the pressure to eat less food in view of maintaining campus figure (keeping slim) or else stand the risk being rejected by the boyfriend. In short, individuals may have the motivation to take desired action, but the fear of being rejected by approvers and disapprovers holds and sets them back. Further quantitative studies are required to test statistically significant approvers and disapprovers in order to better inform behavioral change design.

Furthermore, the issue of competing priorities was a prominent perceived barrier, as evident in the following verbatim statements *“boyfriends often set competing priorities, they would like to spend as much time with us, yet we have other priorities to attend to as well (P₂FG₆).* *It sometimes becomes a dilemma managing the conflicting interests, as they over insist (P₃FG₆)!’*. Chen and Hou, (2017) and Marmot (2017) categorized the issue of competing needs as an accessibility barrier because it deters individuals from accessing and or taking desired actions.

In addition, the perceived barriers related to poor quality of healthcare services, especially at the University hospital included long waiting time, shortage of essential drugs, unfriendly health workers, and limited scope of the services as suggested by some of the verbatim statements below.

First, you have to wait for long to see a doctor, only for him to prescribe for you medicine to buy from private pharmacies (P₉FG₃), then the nurse was all on your neck- girls find no motivation to go through all these processes, and prefer to go directly to private clinics and pharmacies where the services are available on counter without requiring to know identity of the consumers (P₆FG₅).

There is evidence that perceptions about quality inhibit acceptability of healthcare services (Marmot et al., 2008; Sibley & Glazier, 2009) even if they were available. For instance, the female students preferred private clinics and pharmacies because they met their needs, understanding, and interpretation of quality unlike at the University hospital. The constraint however is that private facilities

charge higher fees. Besides, on counter services imply minimal interactions with the clients. These become limiting to accessing essential primary healthcare services. Further, the issue about unfriendliness of nurses suggests lack of cultural competence or may be an attitudinal issue, both of which would require creating awareness on special health needs of female students.

Not only those, but emotional barrier perceptions like fear of pain, failure, knowing health status or being examined by opposite sex health worker emerged from two of the focus groups, with cumulative frequency of six. *“Because of fear, female students shy from taking screening tests to know their health status. Some of the procedures like for cervical Cancer are painful or uncomfortable (P₁FG₆, P₄FG₂). Moreover, girls don't like to show themselves to male gynecologists (P₇FG₆). To me, as much as a try, I just don't seem to lose any weight at all (P₅FG₇)”*. Hasahya et al. (2016) categorized most of these as acceptability barriers.

Moreover, lifestyles related barriers like the desire for luxurious life, extravagancy, desire for high class of living, and greed for money emerged from two of the focus groups, and accumulated at least six tallies. Apparently, owing to these desires, some female students find it difficult to avoid blessers, or eat healthy diets, or choose between attending social events and going for physical exercises. *“The love for money, living beyond means, the desire for expensive smart phones, laptops, clothes and shoes among others, predisposes female students to risks of many preventable diseases”*.

These lifestyle appears closely related to peer pressure and influence since each time lifestyle emerged, peer pressure and influence was mentioned too as an explanation. In fact, both variables emerged from two focus groups, with very similar frequencies. And, while peer pressure emerged as a barrier, it is important to note that it has been reported by other studies elsewhere- as a facilitator for health behavioral change. Similarly, role expectations emerged both as a barrier as well as facilitators for adopting multiple PHBs.

As facilitator, participants argued that owing to ascribed and achieved roles that the society expects of them, some individuals feel challenged to take desired actions. It instills a thinking of being a role model. Moreover, participants ascent that notifiable differences occur among courses and even halls of residences. Apparently, the way a science student, like those studying medicine are expected to behave is quite different from their Arts counterparts. By virtue of being a medical student, one is expected to show seriousness.

Perceived Cues to adoption of multiple PHBs

The focus groups enlisted several perceived cues to action, of which those ranked among top six were grouped into 16 categories, as shown on **Table 5**. By cues to action, we refer to triggers of readiness to act positively or rather internal or external events that could trigger individuals' readiness to taking desired PHBs. It attempts to answer the question, *“what were those events that could break procrastination, and trigger the undergraduate female students to take desired actions?”*.

Table 5: Perceived Cues to Action, from Focus Groups Perspective.

	Category	How many focus groups ranked the cues to action among top six?	Cumulative Frequency***
1	Health/Medical Camps	2	6
2	Health Adverts/messaging/awareness	2	3
3	Knowledge: Exposure e.g. wifi internet, formal education, awareness, access to information	3	11
4	Positive health outcomes, recovery of friends/close family members on early treatment/testimonies	2	7
5	Role expectations/positive social pressure	3	6
6	Social networks, social support, friends	1	5
7	Support from friends/close relatives	2	6
8	Self-confidence	4	9
9	Role models/change agents	1	3
10	Research findings	2	6
11	Religious affiliation/Spiritual guidance	3	9
12	Free primary healthcare services	1	2
13	Onset of signs and symptoms	2	6
14	Death of a close friend or family member	1	6
15	Bad personal experiences of ill-health	3	4
16	Increased cost of abortion/emergency pills	1	1

*** 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.

Generally, these cues to action could be categorized broadly into three subgroups; those founded on the fear appeal visavie those based on the positive deviance approaches or a mixture of both strategies. The former include cues number 13 to 16, while cues number four and nine are typical examples of positive deviance. Others like research could be a mixture of both.

As the case was for perceived barriers, having appropriate knowledge was the most dominant cues to action- emerging from three focus groups, with cumulative frequency of 11 tallies. Among sources of knowledge and health information highlighted by participants, the internet was frequently proposed. Internet hosted social media platforms like WhatsApp, and face book should be exploited to advance health messaging. In fact, awareness is the first step in the stages of behaviour change. Nonetheless, as to whether possessing appropriate knowledge would translate in healthy PHBs remains questionable, as reported in other health behavioral studies, and calls for further comparative longitudinal studies.

Participants argued the University administration to install free wifi hotspots in the lecture rooms, halls of residence and common leisure joints. Also, to provide strategic platforms for creating health awareness, and where possible integrate basic health education in the formal curricular so that Arts students, who constitute a greater proportion of enrolments at the University can have the chance to gain basic knowledge on prevention of common NCDs. Similarly, they recommend strengthening of counselling and guidance services as a source of health information to female students. Indeed, there is scientific evidence to support these recommendations. For instance, two cohort studies (King et al., 2007; Benzies et al., 2008) reported education as the strongest facilitator for health behavioral change, while more recently Enjezab et al. (2012) elucidated the importance of health related knowledge as a promoter of health behavioral change.

Research as a cue, emerged from two focus groups with cumulative frequency of six. While research and knowledge are closely interlinked, the authors opt to report research separately because we could not readily cite other primary studies or systematic reviews that had reported research as a cue to action. This finding is a positive development since the University is a renowned research hub, and if students find the incentive in research findings to take desired actions- is a favorable platform to promote PHB change. As such, disseminating findings on open access journals should be encouraged to potentially increase accessibility, uptake and utilization (Asaku et al., 2018) since it offsets some of the financial cost related barriers to target audience.

Self-confidence emerged from four focus groups, with cumulative frequency of nine tallies. The participants maintained that if individuals gain knowledge and

awareness, they build confidence in themselves, which in-turn translates in motivation and incentives to take actions. Self-confidence plays a critical role not only in initiating actions, but also maintaining the change through perseverance.

According to literature, the constructs of self-confidence (belief in one's personal worth and likelihood of succeeding), self-esteem (general feelings of self-worth or self-value) and self-efficacy (belief in one's capability to succeed at tasks) are closely related. In fact, as evident from the definition, self-confidence is a combination of self-esteem and self-efficacy. So, self-confidence is an internal cue. Qualitative studies by Berg, Cromwell and Arnett (2002), and Fransson et al. (2012) among others found perceptions of lack of capability as a barrier to participating in physical activities.

Religious affiliations and spirituality emerged from three focus groups, with cumulative frequency of nine tallies. *“female students suffering from social phobia could participate in fellowships in the halls since these fellowships have fewer participants unlike in the Church (P₅FG₁)”*. Our previous study (Asaku, Kiguli & Agaba, 2019b) as well as those conducted elsewhere around the world have upheld the role played by religion as a statistically significant predictor of health behaviour change.

Positive health outcomes such as recovery of a friend or close family member from illness, as a result of early detection and prompt treatment (EDPT), or if screening results turn out to be negative, would easily prompt undecided individuals to follow suite. Testing negative for a scary condition or recovery is an incentive for individuals to take desired actions. *“For instance, during the last health camp held at the campus, some girls who declared their negative status to cervical cancer inspired others to test for the same (P₁₁FG₂)”*. Health camps are outreach programmes to take primary healthcare services closer to the target population. *“Since health camps are temporal and mobile, female students are less fearing to visit them (P₂FG₁). Besides, the health workers are friendlier, most of them being none University or government employees (P₄FG₂, P₁FG₁)”*. Participants argued the University administration to increase frequency and scope of health camps, to cover more NCDs.

These health camps would work along with health adverts, creating awareness about availability of the services to increase turn-up. Kelly et al. (2016) coined the importance of proper messaging in promoting PHBs. However, ensuring that health messaging is gender transformative is critical, by targeting both male and female students.

Social networks and social support from friends and peers emerged from one focus group, but scored cumulative frequency of five tallies. Social networks

comprise peers with common interest, as such is potentially a strong promoter and facilitator of behaviour change. Social networks include informal internet based platforms like WhatsApp groups, Facebook, Skype etc. They also include formal and informal off-internet groups like student associations. *“The annual cultural gala could be a good platform for health promotion since it attracts large number of student associations (P₇FG₄)”*. The problem with the freshers’ week is that it has become business focused. Social networks, and support from friends or close family members are closely related cues to action, both being components of social capital. Smith-Dijulio, Windsor and Anderson (2010) coined the importance of social support in facilitating adoption and maintenance of preventive health behaviours by young women.

Role models, as behavioral change agents are individuals with admirable positive attributes. They can influence decision of followers. Having role models in social networks is likely to increase efficacy of the network triggering desired PHBs. By way of a simple definition, a role model is a person whose behaviour, example, or success is or can be emulated by others, especially by younger people. Caperchione et al. (2012) and Hooker et al. (2011) among others upheld the role played by role models in promoting PHBs.

Further, Kelly et al. (2016) observed that some issues could be both barriers and facilitators depending on the context. In the present study, participants reported increased cost of abortion and emergency pills as facilitator of change. Apparently, students who experienced unwanted pregnancies suffer from high costs of safe abortion or frequent use of emergency pills. Owing to such mastery experiences, they develop the motivation to avoid similar actions that could lead them into similar troubles. Other cues founded on the fear appeal and reported by this study are bad previous experience of ill health, death of a close friend or family member, and onset of clinical signs and symptoms of ill health.

Lastly, free primary healthcare services (like; screening services, counselling and guidance, fitness physical activities) was also reported as a facilitator for uptake of PHBs by the female students at Makerere University. It is perceived as part of solutions to the looming problem of financial constraints.

Study limitations

Cross-sectional design does not in any way infer causality despite significant associations. The study targeted resident undergraduate female students, which constitute only a small proportion of the total University enrollment. This limits the extent with which the results can be generalized to the wider student population. Finally, we did not adjust for potential effects of co-founders in the χ^2 statistical test.

CONCLUSIONS

The current study contributes to body of knowledge on multiple health behavioural change and the emerging concept of healthy Universities, and recommends that future health promotions and behavioral change messaging should adopt gender transformative approaches that engage both female and male students, and take advantage of religious places of worship and leaders to channel change messaging. These results have policy implications towards achieving a healthy university and the World Health Organization’s Global action plan (2013-2020) for prevention and control of noncommunicable diseases.

List of Abbreviations

EDPT- Early Detection and Prompt Treatment
 NCD- Noncommunicable Disease
 WHO- World Health Organization
 FAQs- Fixed Alternative Questions
 CVI- Content Validity Index
 PHB- Preventive Health Behaviours
 PA- Physical Activity
 UNCST- Uganda National Council for Science and Technology

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 datasets used and analyzed 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 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 and others for the support they provided during data collection.

REFERENCES

1. Afolabi, M. O., Daropale, V. O., Irinoye, A. I., & Adegoke, A. A. Health-seeking behaviour and student perception of health care services in a university community in Nigeria. *Health*, 2013; 05(05): 817–824. <https://doi.org/10.4236/health.2013.55108>.
2. Amin, M. F. *Social Science Research: Conceptions, methodology and Analysis*. Makerere University, Kampala, 2005.
3. Asaku, S.T., Kiguli, J. & Agaba, J.K. Public Health Concerns and Risk Perceptions of Noncommunicable Diseases among Undergraduate Female Students at Makerere University: A qualitative study, *World Journal of Healthcare Research*, 2019; 3(3): ISSN: 2457-0400, 41-49.
4. Asaku, S.T., Kiguli, J. & Agaba, J. K. Influence of Subject Characteristics on Adoption of Multiple Preventive Health Behaviours against Noncommunicable Diseases: A survey of Female Students at Makerere University, accepted for publishing on the *Texila International Journal of Public Health* (May, 2019), 2019b.
5. Asaku. S.T., Karyeiya. G.K., et al. Individual Predictors of Healthcare Research Utilization: A case of Arua District Local Government, West Nile Uganda'. *Texila International Journal of Public Health*, 2018; 6(4). DOI: 10.21522/TIJPH.2013.06.04. Art001 ISSN: 2520-3134.
6. Beauchamp, T. L., & Childress, J. F. *Principles of Bioethics* (7th ed.): Oxford University press, 2013.
7. Berg JA, Cromwell SL, Arnett M Physical activity: perspectives of Mexican American and Anglo American midlife women. *Health Care Women Int* 23: 894–904. Pmid: 12487704, 2002.
8. Benzie KM, Wangby M, Bergman LR Stability and change in health-related behaviours of midlife Swedish women. *Health Care Women Int*, 2008; 29: 997–1018. Pmid: 18821211.
9. Boltana, A. T., Khan, F. A., Asamoah, O. B., & Agardh, A. Barriers faced by Ugandan university students in seeking medical care and sexual health counselling: a cross-sectional study, 2012; 12(986). Retrieved from <http://www.biomedcentral.com/1471-2458/12/986>.
10. Caperchione C. M, Vandelanotte C, Kolt GS, Duncan M, Ellison M, George E, et al. What a man wants: understanding the challenges and motivations to physical activity participation and healthy eating in middle-aged Australian men. *Am J Mens Health*, 2012; 6: 453–461. pmid: 22516565.
11. Champion, L. V., & Skinner, S. C. The Health Belief Model: In Glanz Karen, Rimer K. Barbara, & Viswanath K. *Health Behavior and Health Education: Theory Research and Practice Research and Practice* (4th Ed). San Francisco: Jossey-Bass, 2008.
12. Champion, K. E., Mather, M., Spring, B., Kay-Lambkin, F., Teesson, M., & Newton, N. C. Clustering of Multiple Risk Behaviors Among a Sample of 18-Year-Old Australians and Associations With Mental Health Outcomes: A Latent Class Analysis. *Frontiers in public health*, 2018; 6: 135. doi:10.3389/fpubh.2018.00135.
13. Charan, J., & Biswas, T. How to calculate sample size for different study designs in medical research? *Indian journal of psychological medicine*, 2013; 35(2): 121–126. <https://doi.org/10.4103/0253-7176.116232>.
14. Chen, J., & Hou, F. Unmet needs for health care. *Health Reports*, 2017; 13(2).
15. De Souza Dantas, M., Dos Santos, M. C., Lopes, L., Guedes, D. P., Guedes, M., & Oesterreich, S. A. Clustering of Excess Body Weight-Related Behaviors in a Sample of Brazilian Adolescents. *Nutrients*, 2018; 10(10): 1505. Doi: 10.3390/nu10101505.
16. Enjezab B, Farajzadegan Z, Taleghani F, Aflatoonian a Internal motivations and barriers effective on the healthy lifestyle of middle-aged women: A qualitative approach. *Iran J Nurs Midwifery Res*, 2012; 17: 390–398. Pmid: 23853654.
17. Fransson EI, Heikkila K, Nyberg ST, Zins M, Westerlund H, Westerholm P, et al. Job strain as a risk factor for leisure-time physical inactivity: an individual-participant meta-analysis of up to 170,000 men and women: the IPD-Work Consortium. *Am J Epidemiol*, 2012; 176: 1078–1089. Pmid: 23144364.
18. Gibson, P. R., Kovach, S., & Lupfer, A. Unmet health care needs for persons with environmental sensitivity. *Journal of multidisciplinary healthcare*, 2015; 8: 59–66. <https://doi.org/10.2147/JMDH.S61723>.
19. Glaser, B.G. The Content Comparative method of Qualitative Analysis. *Grounded Theory Review an International Journal*, 2008; 3(7).
20. Glaser, B. G., & Strauss, A. L. *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine, 1967.
21. Glaser, B. G. *Theoretical sensitivity*. Mill Valley, CA: Sociology Press, 1978.

22. Glaser, B. G. *Discovery of grounded theory*. Chicago: Aldine, 1992.
23. Harrington, J., Perry, I. J., Lutomski, J., & et al. Living longer and feeling better: healthy lifestyle, self-rated health, obesity and depression in Ireland. *Eur J Pub Health*, 2010; 20: 91–95. doi:10.1093/eurpub/ckp102.
24. Hasahya, O. T., Berggren, V., Sematimba, D., Nabirye, R. C., & Kumakech, E. Beliefs, perceptions and health-seeking behaviours in relation to cervical cancer: a qualitative study among women in Uganda following completion of an HPV vaccination campaign. *Global Health Action*, 2016; 9(29336): 1–9. Retrieved from <https://doi.org/10.3402/gha.v9.29336>.
25. Hochbaum, G. M. *Public participation in medical screening programs: A socio-psychological study*. (Vol. 572). United States: Washington: Division of Special Health Services of the U.S. Public Health Service, 1958.
26. Hooker SP, Harmon B, Burroughs EL, Rheume CE, Wilcox S Exploring the feasibility of a physical activity intervention for midlife African American men. *Health Educ Res*, 2011; 26: 732–738. Pmid: 21597100.
27. Jamison, D.T., Summers, L.H., Alleyne, G., Arrow, K.J., Berkley, S., Binagwaho, A., et al. Global health 2035: a world converging within a generation. *Lancet*, 2013; 382(9908): 1898–955. [http://dx.doi.org/10.1016/S0140-6736\(13\)62105-4](http://dx.doi.org/10.1016/S0140-6736(13)62105-4).
28. Janz, N. K., & Becker, M. H. The Health Belief Model: a decade later. *Health Education*, 1984; 11: 1–47.
29. Kasl, S. V., & Cobb, S. “Health Behavior, Illness Behavior, and Sick-Role Behavior: I. Health and Illness Behavior. *Archives of Environmental Health*, 1966; 12: 246–266. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/5322534>.
30. Kelly, S., Martin, S., Kuhn, I., Cowan, A., Brayne, C. & Lafortune, L. Barriers and Facilitators to the Uptake and Maintenance of Healthy Behaviours by People at Mid-Life: A Rapid Systematic Review. *PLOS*, <https://doi.org/10.1371/journal.pone.0145074>, 2016.
31. King DE, Mainous AG 3rd, Geesey ME Turning back the clock: adopting a healthy lifestyle in middle age. *Am J Med*, 2007; 120: 598–603. Pmid: 17602933.
32. Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*, 2012 Dec 15; 380(9859): 2095–128. [http://dx.doi.org/10.1016/S0140-6736\(12\)61728-0](http://dx.doi.org/10.1016/S0140-6736(12)61728-0) pmid: 23245604.
33. Marmot, M. & Bell, R. Social Determinants and Noncommunicable disease: Time for integrated actions. *BMJ*, 2019; 364(1251): <https://doi.org/10.1136/bmj.1251>.
34. Marmot, M. Social justice, epidemiology and health inequalities. *European Journal of Epidemiology*, 2017; 32(7): 537–546. <https://doi.org/10.1007/s10654-017-0286-3>.
35. Marmot, M., Friel, S., Bell, R., Houweling, T. A. J., & Taylor, S. Closing the gap in a generation: Health equity through action on the social determinants of health. *Lancet* (London, England), 2008; 372(9650): 1661–1669. [https://doi.org/10.1016/S0140-6736\(08\)61690-6](https://doi.org/10.1016/S0140-6736(08)61690-6).
36. Meader, N., King, K., Moe-Byrne, T., Wright, K., Graham, H., Petticrew, M., Power, C., White, M. & Sowden, A.J. A systematic review on the clustering and co-occurrence of multiple risk behaviours. *BMC Public Health*. <https://doi.org/10.1186/s12889-016-3373-6>, 2016.
37. Morgan, D. L. *Focus groups as qualitative research* (2nd Ed.). Thousand Oaks, CA: Sage, 1997.
38. Mugenda, O. M., & Mugenda, A. G. *Research Methods: Quantitative and Qualitative Approaches*. Nairobi, Kenya: Acts Press, 2003.
39. Rosenstock, I. M. The Health Belief Model and Preventive Health Behavior. *Health Education Monographs*, 1974; 2: 354–368.
40. Saha, A. & Alleyne, G. Recognizing noncommunicable diseases as a global health security threat. *Bulletin of the World Health Organization*, 2018; 96: 792–793. Doi: <http://dx.doi.org/10.2471/BLT.17.205732>.
41. Sibley, L. M., & Glazier, R. H. Reasons for Self-Reported Unmet Healthcare Needs in Canada: A Population-Based Provincial Comparison. *HEALTHCARE POLICY*, 2009; 5(1): 87–101.
42. Smith-Dijulio K, Windsor C, Anderson D. The shaping of midlife women’s views of health and health behaviors. *Qual Health Res*, 2010; 20: 966–976. pmid: 20207956.
43. Spring, B., Moller, A. C., & Coons, M. J. Multiple health behaviours: overview and implications. *Journal of public health* (Oxford, England), 2012; 34 Suppl 1(Suppl 1): i3–i10. doi:10.1093/pubmed/fdr111.
44. Strecher, V. J., Champion, V. L., & Rosenstock, I. M. (Eds.). *The Health Belief Model and Health Behaviour*. In D. Gochman (Ed), *Handbook of Health Behaviour Research*. NY: Plenum Press, 1997.
45. Strauss, A. *Qualitative analysis for social scientists*. Cambridge, UK: University of Cambridge Press, 1987.
46. Strauss, A., & Corbin, J. *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage, 1998.
47. UNCST. Uganda National Council for Science and Technology (UNCST): National Guidelines for Research involving Humans as Research Participants. Kampala, Uganda, 2014.
48. WHO. World Health Organization global status report on noncommunicable diseases. Geneva: World Health Organization.

<http://www.who.int/nmh/publications/ncd-status-report-2014/en/>, 2014.

49. WHO. Women and Health: today's evidence, tomorrow's agenda. Geneva, Switzerland: WHO Library Cataloguing-in-Publication Data, 2009.