Original Research Article

A Study On Chronic Infections Among University Students

Abstract

The percentage of university students currently nursing chronic infections/diseases is alarming, and for a long time, these students are ever thought to be healthy. However, research shows otherwise and management of students' health should be recognized and efforts be directed towards the same. This paper aimed to review the work done by other researchers concerning university students when it comes to chronic diseases and their health, make general comments and emphasize the need to have stakeholders focus on university students in terms of acquiring the right and modern technology meet for dealing with the elephant in the room. About 25 published papers were selected from the internet as they came across and a summary was made from each on what the researchers found concerning the university students' health and chronic diseases. It was found that no researcher didn't find unhealthy students and up to 30% of the students can be found infected in a given university. All concluded that the health of the students is deteriorating with time. Therefore, there is a need for stakeholders such as university managements, governments, non-governmental organizations among others to deal with the situation before it's too late. University students are the next-immediate workforce and their health should not be left to fate. Once this workforce is maimed, there shall be a big problem in the future when things slip out of hand: and this work suggests that all stakeholders to come together and arrest the situation on time.

Keywords: Health, Chronic infections, University students.

1 Introduction

1.1 Definition of chronic infections and causes

Chronic diseases can be described as illnesses that are long-lasting in terms of healing or no healing completely, their effects are persistent, can result from causes that are complicated and they are the leading cause of disabilities among people with major impacts on welfare and health services (AIHW,2014; AIHW, 2010). They can vary from minor/slight/mild conditions such as low back pain and debilitating arthritis to life-endangering conditions such as cancers and heart diseases. Chronic diseases may be manageable or unmanageable, and, maybe curable or may be incurable. For untreatable diseases, the patient must prepare for long-term management of the disease. Meetoo (2008) and O'Halloran *et al.* (2004) define chronic diseases as diseases that take at least 3 months without healing, in which period, they can only be controlled. Muntaner *et al.* (2014) define chronic diseases as diseases that take a long period as well as slow in progression as borrowed from World Health Organization. For the case of students, the diseases have long periods and seriously disorient the students' normal life and performance, demanding time-intensive treatments and care. For diseases taking at least 3 months, some health experts classify them as chronic while others take a disease as chronic when it lasts for about 12 months.

According to Godkin and Smith (2017), chronic diseases are persistent or can be latent/hidden infections within the hosts. In some cases, the immune system responds to the acute infections by pathogens (bacteria, viruses, fungi, protozoa, etc.) but the pathogens may escape the system clearance through regulation or modulation of the immune system and establish the chronic infection that is persistent or latent (Oakley *et al.*, 2008; Godkin & Smith, 2017).

Some communicable agents are notable causes of chronic diseases (O'Connor *et al.*, 2006) and these diseases frequently arise from infections. Human exposure to the transferrable determinants of chronic diseases has been facilitated by changes in human behavior like work, migration, recreation, and culture, and the fact that the ecology is evolving. The wildlife behavioral characteristics, the microbial virulence factors, the environment, and the zoonotic infections come together and determine the capacity of infection and the chances of human exposure. Most chronic diseases have common risk factors, often co-exist, act together to dictate one's health, have similar features (AIHW,2014) and treatment of the diseases is a combination of prevention, care, and diagnosis. The common behavioral risk factors can be grouped into 4 categories namely: unrestricted consumption of alcohol, smoking, poor feeding, and poor physical activity.

1.2 The Corona-Virus Epidemic

The Corona-virus disease is an infectious disease that is caused by a virus called SARS-CoV-2, and its outbreak started in the year 2019. The disease has since spread out throughout the world. The spreading of the disease has caused a threat to the healthcare system with some people recovering without medical attention and some requiring medical treatment for positive results. Currently, there is no cure for the disease but preventive measures have been put in place such as social distancing among people, wearing of face masks when in public places and vaccinations that are meant to minimize the spreading of the disease. In addition, the epidemic has negatively affected the poor, those in rural areas as well as in marginalized populations in terms of accessing healthcare services due to lockdowns every now and then. On top of hindering the prevention of chronic diseases, the epidemic has disrupted management of the same. Symptoms include coughing, fever, feeling tired, headaches and sore throats among others. Chest pains and difficulties in breathing are the serious symptoms of an infected person. Individuals with underlying medical conditions such as chronic diseases like diabetes, respiratory disorders, cancers, hypertension and gastro-intestinal diseases are at higher risk of developing the disease and even succumbing to death (Haybar *et al*., 2020; Singh *et al*., 2021; ICRC, 2020; Guler & Ozturk, 2020; Umaru *et al*., 2020; Hacker *et al*., 2021).

1.3 Chronic Diseases' Burdens

The effects of chronic diseases are so devastating that, the United Nations made it it's objective to work towards reducing the deaths due to these diseases by 25 percent by the year 2025 among the individuals aged from 30 to 70 years (AIHW,2014; Hunter & Reddy, 2013; Beaglehole *et al*., 2011). If the issue of chronic diseases is not checked early enough, the number of infected students and people, in general, would keep on increasing as the risk factors continue to increase with the growing and aging students' population and the general population at large (AIHW,2014). There will be increasing burdens from these diseases, which might eventually overwhelm the health care systems, modern technology, and economy. Meetoo (2008) notes that chronic non-communicable diseases are the leading causes of death in most of the industrialized countries, and despite the burden from these diseases globally, the responses and the efforts geared towards preventing them have been slow, both nationally and worldwide. Chronic diseases are the main worry for community/public health (Malyshkin, 2014).

In Australia, by the year 2008, about 35 percent of the population was suffering from at least 1 chronic infection (AIHW,2014; AIHW,2012a). The number of infected persons was increasing with the increase in age of the individuals. The common diseases in the population were asthma, high blood pressure, depression, diabetes, stroke, coronary heart disease, arthritis, COPD, osteoporosis, lipid disorders, and high blood cholesterol. By the year 2012, 4.6 percent had diabetes, about 15 percent had arthritis, 10 percent had asthma, 1.6 percent had cancers, 10 percent had asthma, 13% had back problems, 5% had vascular or heart disease or stroke while about 10% had hypertension (AIHW,2014; ABS, 2013a; 2013b). The diseases that caused most of the deaths by the year 2011 (AIHW,2014; AIHW, 2013; ABS, 2013a; Britt *et al.*, 2013) include coronary heart disease (14.6%),

cerebrovascular disease (7.7%), Alzheimer disease, and dementia (6.7%), lung cancer (5.5%) and chronic lower respiratory diseases (4.5%). The greatest burdens by the year 2010 were attributed to coronary heart diseases (7.8%), low back pain (7%), COPD (3.5%), depression (3.2%), and cerebrovascular disease (3.1%). By the year 2014, 90% of the deaths in Australia were associated with underlying conditions of chronic diseases with cardiovascular disease (stroke and coronary heart disease), lung cancer, dementia and Alzheimer disease, chronic lower respiratory disease as the most common underlying causes. In most cases, more than 1 disease causes death, an average of 3 diseases are associated with death among people and an average of 5 or more diseases are linked with death in 20% of all deaths (AIHW, 2012c; AIHW,2014).

In terms of costs, by the year 2009, the most expensive diseases were cardiovascular diseases, musculoskeletal, mental disorders, and oral health, costing up to a minimum of 27 billion dollars in Australia in just that year. The costs that chronic diseases come with include the direct and indirect costs (Bloom *et al.*, 2011; Jha *et al.*, 2012). The direct ones include the costs for diagnosis, the procedures undergone, the drugs administered and purchased, inpatient and outpatient care. Non-medical costs at the personal level include transportation costs when seeking treatments and care while the nonpersonal costs include those meant for information, research, education, and communications. Indirect costs are associated with losses in incomes due to the diseases. In general, the listing of burdens from the infections cannot be exhausted.

1.4 The diseases among the university students

The number of infected university students is increasing day-in-day-out to the extent that a single university can have up to 200 infected students at a time with about 100 infected students being registered per year (Redden, 2007).

Universities need a lot of assistance when it comes to chronic diseases among students because the situation is worsening (Redden, 2007), diseases increasing, pains multiplying and burdens continue to be heavier on students' shoulders. They face the challenges of those chronic illnesses to the point that they are nowadays facing the diseases that were thought to be "for old people" such as diabetes in addition to HIV/AIDS, cancers, epilepsy, heart diseases, arthritis, chronic fatigues syndrome, lupus among others. They have the challenge of disclosing their conditions and as a result, the vital information remains unknown until a student suffers a blow that makes the surrounding stakeholders get to know about the affected student. Many infected students choose to keep the information to themselves. This has made universities not force them to disclose their issues though they are ever encouraged to share with the university bodies that are concerned with their welfare (Redden, 2007).

Chronic diseases that are non-communicable among university students have been linked with many risk factors that lead to the development of these diseases including tobacco use, alcohol consumption, foods with a lot of salts, sugars, calories, preservatives and lipids, poor fruit and vegetable intake, obesity/overweight and lack of physical exercises, adaptation to campus life (Morais *et al.*, 2018; Malta & Silva, 2013; Rombaldi *et al.*, 2014; Bernardes *et al.*, 2015; Lima *et al.*, 2014). According to (Pereira *et al.*, 2015; Morais *et al.*, 2018), the chronic diseases among the students have been diabetes, gastroenteritis, high blood pressure (hypertension), respiratory problems, cardiovascular diseases, heart diseases, cancers, pneumonia and cerebrovascular diseases. These infections among students have led to rising costs related to health (Bahia & Araújo, 2014; Morais *et al.*, 2018) among other challenges.

From the fact that the university population is composed of undergraduate and postgraduate students, the postgraduate ones are usually older than 24 years, even some staff are registered as students for further studies to help advance in their careers. This dismisses the public notion that university students are just young people aged around 17 to 24 years. This is an eye-opener to researchers that the university population is composed of both youth and adult students and hence the diseases thought to be for adults only can be found among university students. So, the collection of all ages among

university students can make it possible to pass communicable chronic diseases among themselves, even to the youngest students. It's also possible for a student or a group of a certain age-set to copy the lifestyles of other students or groups including those lifestyles that can put one at the risk of contracting or developing chronic diseases. Even Ngendahayo *et al.* (2019) have found an average age of university students that is above the range of 17-24 years, in which case they have sampled students whose average age is 29 years. The fact that the university environment is more or less the same as that of general community: in terms of moving in and out of campus circumferences at all times, ethnic composition, a larger percentage residing off-campus with the general public, relationships and interactions that are both unrestricted and without boundaries in terms of age, social class, believes and so on, the university students' group cannot be thought to be special that is excluded and isolated from the general public's influence and challenges.

Another reality is that the university population has both independent and dependent students as is evidenced by most of the students who rely on loans for their studies and meeting ends (Otunga *et al*., 2021). What this means is that some are working or sustaining themselves while others are receiving from parents, friends, sponsors among others. Therefore, students must survive/live, just like the general public, in whatever means. Another fact about university students is that the population can be sub-divided into healthy and unhealthy groups as it is evidenced by university dispensaries, which is the same as the non-university populations. One of the groups can be disabled students, while another one can be the group composed of those suffering from chronic infections. Experience shows that the research done on university students' health is wanting. The lack of enough documents in this sector has made many believe that university students do not need any serious attention regarding their health, yet, there is a broad variety of chronic and acute maladies and problems among students that cause death and suffering burdens. Not only is this dangerous but also leads to a lack of adequate health services and planning for the affected populations in universities. The situation is neglected when it should be given the right consideration.

While some chronic diseases among students are from childhood due to genes and inheritance, others are acquired within all ages of people as evidenced by the fact that diseases like diabetes, cancers, arthritis, asthma, migraine headache, ulcers, leukemia, bone tumors, and inflammatory bowel diseases are regularly registered among people including students at the public and university health-care centres and are common among adolescents. So many infections typically develop during the university years of study. It has also been reported that the cases of HIV/AIDS that are diagnosed among people, many cases are from persons between 15 and 49 years of age, the age that includes that of university students (Thairu *et al*., 2015).

According to Kassie *et al*., (2019) and Albrektsson *et al*., (2009), the factors that contribute to some of the chronic infections facing the university students include the consumption of alcohol, use of other drugs and smoking tobacco, adopted sexual behavior that transmits diseases, stress, nutritionally unbalanced foods and lack of physical exercises. It's of paramount importance for health professionals, governments and other stakeholders to be aware of the health challenges facing the university students since this group is the next immediate work-force. If it's adversely affected, this can translate to a maimed work-force and may finally affect the production and offering of goods and services both locally, nationally and internationally. Understanding the students' needs can help in planning, insuring them, giving them the right attention, improving their environment, improving their health, preventing diseases, and equipping the students' health centres with the necessary equipment and modern technology.

Nichol *et al.* (2005) note that the impact/effects of chronic diseases and poor health in general among university students have not been well assessed or described. This means that the study on the loss/impact on university students due to illnesses has not been given the deserving attention, resources and efforts to help properly and categorically conclude the study. Poor health affects

students' effectiveness in class and at work, including their performance in co-curricular activities like games (Bramley *et al.*, 2002; Smith *et al.*, 1998; Smith *et al.*, 1993; Keech *et al.*, 1998; Nichol *et al.*, 2005).

Among the university students, STDs that include gonorrhoea, candidiasis, chlamydia infection, trichomoniasis and chronic infections like HIV and cervical cancers are very common (Thairu *et al.*, 2015). In some nations like Nigeria, the STDs pose big problems in medical, economic, and social fields, but globally, these diseases are predominant among people aged between 15 and 49 years, the age bracket into which university students fall. The diseases are not just invading the urban areas but also the rural areas, making it a wide-region menace. In universities, the spread of STIs is facilitated by some facts including many have multiple sexual partners, practices of relationships between young and very old partners (big variation in ages), having sex practices that are not safe, sexes between partners who are not steady, adopted life-styles like securing 'sponsors' to fund expensive and high-class lives, peer-pressures, among others.

Research shows that young peoples' health (including that of university students) is getting more concerns/attention nowadays (Hernandez *et al.*, 2016) because a lot of data are showing increasing prevalences of ill-health like obesity as a risk factor. Poor eating can be a habit that can lead to the development of serious and deadly maladies like malnourishment and obesity. The truth is that the way the students eat dictates their health status. If students can access the variations in food from markets, this can help them decrease the risk of developing life-endangering diseases. Not just the quality, quantity, and variety of foods that determine the students' health, but also the eating patterns and arrangements like meal-times play a key role in shaping their health.

According to Kassie *et al.* (2019), university students are inclined to sex practices that expose them to the dangers of contracting STDs on top of pregnancies that are not planned for and abortions that are unadministered for. This is as a result of excess freedom that students are not able to manage properly for their good and advantage. Sexual behaviours that are risky increase the odds of contracting STDs while a pornographic lifestyle interferes with the normal sexual desires of an individual. Staying away from parents increases students' freedom and influence from peer-pressure and this can lead the students to adopt new lifestyles that are different from what they are used to at their homes. The previous history of the STDs among students may lead to the spreading of the diseases because of relapse, lack of compliance with medication, drug resistance by the infections, lack of treatment among the partners, inappropriate treatments, and other reasons.

2 Methods

A literature search was done on several papers that were gotten from the internet. The papers were involving university students and chronic infections only. A total of 25 published papers from recent years were summarized.

2.1 Procedures

Papers on students and chronic infections were downloaded from the internet, read and a summary was made from each. The research was worldwide and not confined to a specific region.

3 Results

3.1 Literature on chronic diseases among university students

Ozdemir *et al*. (2000) worked on research aiming to estimate asthma and allergy prevalences among the university students joining at the first year in Turkey where data was collected using a questionnaire. It was found that about 0.4 percent of university students had suffered from asthma for the previous 1 year, 0.7 percent had a history of asthma in their life while for the past 1 year, about 8% had experienced wheezing problems. Dermatitis was found to be at approximately 6%, asthma-like symptoms were among 17% of the students while about 10% had rhino-conjunctivitis. Among the smokers, asthma and the like-symptoms had significant rates and indeed asthma and asthma-like

symptoms were found to increase with smoking. Positive skin prick test was among 27.3 percent of those suffering from asthma and about 15% of those with asthma-like symptoms. Asthma and the like-symptoms rates were found to be lower in the universities in Turkey among the freshmen compared to those from other countries. The rates were also lower compared to the rates in the USA in the general population (2.6% for asthma) and other regions in the world (about 26% in some parts).

The study on the upper respiratory tract illnesses (URIs) and their impacts on work performance, academic performance and health among the university students was conducted by Nichol *et al.* (2005), in which a cohort of 42000 students was followed up for 6 months. The URIs in this study were on colds and influenza-like illnesses (ILIs) only. The mean age of the studied students was about 23 years, 8.5% had shown they had asthma before, 0.4% had diabetes history, 19.1% smoked every day and about 37% had poor health in general. In the study days, 91% of the students had at least one of the URIs type of infections (either cold or ILIs), about 37% had more than one ILI while 83% had more than one cold. Those who visited the health care facilities were about 22%, antibiotic users were about 16%, those who relied on over-the-counter medications were about 75%, about 41% missed at least one class in a semester while those who did poorly on class work were about 46%. ILIs affected the students more than the colds. Generally, the infections studied had significant impacts on students' health and well-being and the rates of work loss and one's effectiveness at work have been substantial.

The research among the university students in the USA- Grand Valley State University (GVSU)- on awareness and knowledge of HIV/AIDS was done by Rucker (2005). It was found out that most students lack knowledge on dangers of pressures in sex, the STDs and condom use, and many adults suffering from the HIV/AIDS contracted it during adolescence stages. Many think that other STDs like gonorrhoea, herpes and syphilis cannot increase the likelihood of contracting HIV, and this is a misconception since once the immune system is compromised, chances of other diseases being contracted go high. The majority (76%) were found to avoid using condoms when engaging in sex and this is risky behavior. Students were found to under-utilize the resources at their disposal (as offered by the universities) in preventing the spread of the disease among themselves.

The risk behaviours, awareness and attitudes towards HIV/AIDS among the students in universities in Wuhan, China, were studied by Albrektsson *et al.* (2009) in which, young people have been considered as a group that is at high risk due to their attitudes when it comes to sexual behaviours. The method applied was the stratified cluster sampling with a questionnaire as a data collecting tool on top of interviews. The male and female students sampled are equal (50% each) with a mean age of about 20 years that ranges from 17 years to 34 years. The single, engaged, married, widowed and divorced were approximately 94%, 3.6%, 0.7%, 0.3% and 0.1% respectively. Almost all the students had heard about the disease and most of them heard from the media (51%) while about 40% heard about it for the first time in school. Slightly above 50% felt they don't have enough information about the malady. About 95% knew to distinguish between the HIV and the AIDS. Religion doesn't play any role in influencing the awareness of the HIV as well as in determining the number of sexual intercourses. Approximately 40% and 36% know that the disease is spread through sexual intercourse and blood transfusion respectively. Other methods of transmitting the disease are known to be kissing, needles sharing, breast-feeding the infants and bites from mosquitos. About 4% think that the disease can be completely cured, 27% would treat differently any patient suffering from the disease and most believed that groups like drug addicts and sex-workers are likely to be more exposed than other groups. Many can only talk about the disease with friends (74%) and about 46% would like to undertake a HIV test. Generally, the research shows that the topic is not discussed openly.

Alawad *et al.* (2011) have investigated the prevalence of asthma in Sudan among the university students and workers- Khartoum State. The work realizes that asthma prevalence is rising but data is limited. Random sampling was applied to those aged between 18 and 77 years and a questionnaire

was used in data collection. The majority of the participants were females (about 57%), the majority of the students were aged between 18 and 27 years (91 percent) and females were more asthmatic (64%) than males. The prevalence of the disease was found to be at 7.4 percent. Wheezing was at 6.5 percent and other symptoms of asthma were at 5.6, 6.2 and 5.9 percent for breathlessness in the morning, shortness of breath while at rest and coughs when asleep respectively.

The research by Mwamwenda (2013) was on university students in Africa trying to understand the level of understanding on the transmission of HIV/AIDS, prevention, infection and the effects on changing the sexual behaviours. The sampled students were from universities in Kenya, Tanzania and South Africa and data was collected using a questionnaire. It was found that large percentages of universities students in Africa are sharing cigarettes, drinks, seats, toilets, clothes and foods among themselves- including with those infected with the disease. From the research, 42% from Kenya, 81% from South Africa and 61% from Tanzania were kissing with infected students. Many didn't think that helping the infected, shaking hands with infected persons and mosquito bites were capable of spreading the disease but blood transfusion and sexual relationships with infected students were thought to spread the disease. Most from Tanzania and South Africa didn't believe they can get infected while the transfer of the knowledge the students have to the real-life practices was found to be at work. It was concluded that the students from African universities are well-knowledgeable when it comes to HIV/AIDS and practice what they know in their life to avoid contracting the disease because the cure is not yet found.

Asante and Oti-Boadi (2013) have studied the topic of HIV among undergraduate students in Ghana to assess their understanding. A questionnaire was used in data collection and cross-sectional study was applied in the research. The findings show that the average age of the students is 23 years, the level of knowledge was inconsistent and significant across gender and about 45% had not had HIV testing although most of them (90%) were knowledgeable about Voluntary Counselling and Testing (VCT) services and where to access them. Approximately 44% were females, most of the participants (52%) were 1st year students, about 81% were aged between 17 and 25 years, about 61% were single, about 30% were in relationships while approximately 10% are in marriages already. About 45% didn't know that HIV causes AIDS while only about 1% didn't know the full meaning of AIDS. 77.7 percent knew the use of condoms, 70% knew sex abstinence, 63% knew avoidance of sharing piercing objects and 57% knew that being faithful to one's partner are the methods that can help in mitigating the propagation of the disease, and about 11% didn't know that the disease doesn't have any cure so far. It was also found that most of the students had gotten information on the disease from television while only about 27 percent acquired the knowledge from their parents.

Emeka-Nwabunnia *et al*. (2014) investigated the prevalence of HIV/AIDS in Southeast Nigeria among university students as well as their sexual behaviours. The sample included those aged between 19 and 24 years in which a questionnaire and a test (the technique used was the enzyme based immuno-assay) were involved in data collection. Male students were found to have a prevalence of about 2.9%, female have about 4.3% while all the students have about 3.7%. Compared to male students, the female students were found to have many sexual partners, unusual discharge from genital parts, higher rate of infection, forced and transactional sex and non-use of condoms during sexual activities. The rising HIV/AIDS seropositivity is associated with these risk factors among university students. Amazingly, these rates and risky behaviours were found to be worse than the age-mates who are not in institutions of higher learning. The likelihood of contracting the disease was found to be about 4 times among those avoiding condoms compared to those using condoms during sex. The research has also pointed out that approximately 80 percent of the HIV/AIDS cases in the world are among the youths aged between 15 and 24 years- the age in which most university students fall into.

John *et al*. (2014) have investigated the rates of allergies among university students in Ajman, United Arab Emirates. The research applied the cross-sectional survey and questionnaire for data collection, and involved undergraduates only. In the sample, about 67% were female students, about 41% had conjunctivitis, 35% had dermatitis and 15% were suffering from eczema. Allergic conjunctivitis and dermatitis were strongly associated with allergies from family history while dust was found to be the common factor in triggering the allergies while allergies linked with foods (nuts and sea foods), pollen grains and drugs (antibiotics like penicillin) were not common. In all forms of allergies, the most affected were found to be the female students and the allergies were rampant in the spring seasons. The allergies interfered with students' daily routines (45%), in social and extra-curriculum activities (36%), performance in academics (19%) and attending school (17%). The study results are in support that allergic infections are on the high rise in Middle Eastern areas, and this could be due to globalization and urbanization in the region.

A study on university students' attitudes, knowledge and behaviour about the HIV/AIDS was done by Choudhary *et al*. (2015) at Irish University. Data was collected using a web questionnaire. The age of students was about 22 years on average, about 31% and 34% were first- and second-year students respectively. The majority (more than 95 percent) knew how the disease is transmitted from one person to another, the male students were found to be more conscious of their risks about the disease, about 83% had never undertaken any testing for the disease while about 43 percent had exposed themselves to unprotected sexual intercourses. Those who needed education on preventing the disease were about 42%. It was the view of the work that the students at the university level do not practice healthy behaviours in life despite the knowledge they have on the disease.

In Ethiopia, Moges *et al*. (2015) investigated the treatment outcome and rate of tuberculosis among the university students based on retrospective study where data was obtained from hospital and clinic records. On yearly basis, 36 students on average were found to be infected with tuberculosis (TB). The research notes that the university settings in classrooms and hostels/residences provide conducive environments for spreading of tuberculosis. The smear positive pulmonary tuberculosis had about 25%, smear negative pulmonary tuberculosis had approximately 45% and about 30% had extra pulmonary tuberculosis. The prevalence had risen from about 298 to 404 out of 100000 students in year 2009 to 2011, and these rates were found to be higher than the national rates among the university students. For the treatment outcomes, about 20% had been cured, about 50% had completed treatment, 5% were classified as 'defaulted', about 2% were classified as 'failed', about 1% had died, about 23% had transferred out while the success rate for treatment was about 70% in the year 2011.

The study on the profile of the STDs among the university students (or tertiary educational institutions) has been carried out by Thairu *et al*. (2015) in Nigeria. Cross-sectional study was used in which students were randomly screened in laboratories. The study excluded all the students who were suffering from chronic diseases as well as the post-graduate ones. The students were 15-35 years of age, prevalences were found to be as follows: candidiasis was at about 41%, trichomoniasis was about 5%, gonorrhoea was about 3%, chlamydia was about 11%, syphilis was 2.4%, herpes was 3.5% while chancroid was 2.4%. The 41% prevalence of candidiasis was for female students only while gonorrhoea was for male students only.

In Poland, Romantowski *et al*. (2015) investigated the risk factors and prevalence of asthma among university students. The questionnaire was used in data collection in a sample of students consisting of 75% ladies as participants. All the students were on average aged 22 years approximately and the range was from 18 to 36 years. The prevalence was found to be at 9.6% while about 5.5 percent had experienced asthmatic symptoms. The most affected students are those residing in poor environments like unconducive houses. Among ladies, the prevalence was 9.8 percent while it was 10.8 percent among men, with women reporting asthmatic symptoms (21%) more frequently than men do (13%). The prevalence was increasing with decrease in year of study, first year students had 12.7% while

fifth year students had 7.9% prevalence. 15% were found to smoke cigarettes among the asthmatic students and tobacco was considered a risk factor. The allergic rhinitis, absence of medical treatment program and unconducive living environments were found to facilitate the disease's occurrence.

The sexual behaviour and knowledge of HIV/AIDS among the undergraduate university students in Central Ethiopia, main campus of Ambo University, was studied by Sahile *et al*. (2015), in which a cross-sectional study and stratified sampling method were used in the study. The questionnaire used was capable of capturing both qualitative and quantitative data. The average age of the students was approximately 22 years and 20 years for intervention and comparison groups respectively. It was found that, in the intervention group (those in 2nd year of study and above), the understanding of the disease transmission (75.8%) and the methods of prevention (48.5%) were higher than in the comparative group (1st year students only) which had about 69% and 43% for the two respectively. This difference in understanding between the two groups was significant at a 5% level of significance. The life-time sexual intercourse (about 41%) and the use of condoms during sexual activities (about 73%) were found to be higher in the intervention group than in the comparative group which had approximately 35% and 57% for the two respectively. In contrast, reporting of history of STDs was higher in the comparative group (about 6%) than in the intervention group (about 5%). Those students who had multiple sexual partners were found to be 32% in the intervention group and about 36% in the comparative group. In general, a high percentage of students were found to be engaging themselves in risky sexual practices.

Waure *et al*. (2015) researched university students' knowledge about, attitudes and behaviours towards STIs and preventive measures. Data were collected using a questionnaire among the Italian Universities' women students aged between 18 and 25 years. It was found that the mean age was approximately 22 years, about 40% had had more than one sexual partner for the past 3 years while 47% didn't use condoms to protect themselves during sexual intercourse. Only about 3%, 6% and 15% knew gonorrhoea, trichomonas and genital warts respectively as STDs. Approximately 44% are unaware that STDs can cause sterility in both ladies and men while 53% are not aware that the diseases can cause cancers. About 3% didn't know that the STDs can be prevented by condom use and 3% did not know that vaccines help prevent diseases. Generally, the students' knowledge of STIs and preventive measures was found to be inadequate and wanting.

Hernandez *et al.* (2016) investigated the Mendel University (Czech Republic) students' eating behaviours including their behaviours in food preparation, the skills they employ when cooking, the resources they use for food preparation and the associations with quality of diets. The questionnaire was used in data collection among students who were in the second year of study or above, were aged from 18 years and above, and regular undergraduates only. The results show that the undergraduate students were aged between 18 and 29 years, majority of the participants were ladies (67%), most were aged from 18 to 21 years (70%), 89% prepared their own foods, only 20% liked foods with low fats while the majority (80%) are used to foods with high levels of fats, more than 50% opt for less healthy foods during tough times like examination periods, 63% do not choose healthy products for foods, 66% consume sugary drinks several times in a week and sugary products like cookies and chocolates often and so many of them (94%) rely on alcohol regularly. The findings point out that the university students do not know what they ought to eat for the benefit of their health, they take a lot of sugars daily than the recommended doses, have made alcohol part and parcel of their diets, the majority do not go for the option of healthy foods, they change diets for the worse during stressful times of semester, prices of foods and economic conditions force them to go for unhealthy foods as options and alternative and the majority have no interest on what they feed on.

Haroun *et al*. (2016) have assessed the attitudes and knowledge of university students in the United Arab Emirates (UAE) on HIV/AIDS which was motivated by the fact that the HIV prevalence is significantly rising with increasing new infections and deaths related to the AIDS disease.

Convenience sampling was applied and data were collected using a questionnaire. In the end, students from 8 universities took part in the exercise, approximately 17.7% were male students while the rest were females, only about 9% were postgraduate students and the rest were undergraduates, about 90% were single, 8% were married while the rest were widowed, divorced or separated. 61% of the students were found to be knowledgeable about HIV/AIDS. Female, postgraduate and non-Emirati students were more knowledgeable on the issue than male, undergraduate and Emirati counterparts respectively. About 29% had the misconception that the virus can be spread through public toilets while 26% didn't know the disease cannot be cured, and in general, the students were poorly knowledgeable on the treatment of the disease. In this research, the fact of concealing one's status emerged strongly because about 57% indicated that they would never disclose their status to anyone in case they are found positive. Among those who would disclose the vital information on their status, 80% would only inform their parents and no one else, with only 6% informing their tutors like teachers. Stigmatization and discrimination also emerged in this research since about 11% feel that the infected students should be sent away from school.

Among the university students in North of Iran (Sari), the asthma prevalence and the respiratory symptoms have been investigated Mohammadi *et al*. (2016). The researchers have identified the problem as limited availability of data on asthma prevalence among young adults, and have defined asthma as a chronic disorder in which the airways have inflammation. A questionnaire was used in data collection with the majority of the participants being female students (63%). The prevalence of asthma was 3.5% overall, 3.2% among male students and 3.6% among females. It was also found that the prevalence of wheezing was at 11.1%, of coughing while at rest was 12.4%, of night coughs was 13.4%, of breathlessness while at rest was 13.3%, of wheezing when exercising was 17.7% and coughing when at exercise was at 16.7%. The family asthmatic history and smoking tobacco were found to be significant risk factors for asthma among the students. Prevalence was at 19% among the tobacco smoking students while only 3.1% among the non-smoking group. The results suggest that there has been inadequate control for asthma, inadequate diagnosis and treatment among the university students' group.

The prevalence, trends and impacts of chronic diseases on quality-of-life health-wise have been studied by Gazibara *et al.* (2018) at the Belgrade University, Serbia. A questionnaire was used as data collecting tool. The researchers applied Beck Depression Inventory (BDI) to explore attitudes and feelings of students and Health Related Quality of Life (HRQoL) to determine other aspects of life like pains, mental stability and so on as administered by Beck *et al.* (1996) for BDI, Ware *et al.* (1993) and Ware (2000) for HRQoL. Chronic bronchitis with 4.2 percent and asthma with 3.1 percent were found to be the most prevalent chronic diseases among those students. Overall, 16.5 percent of the university students were found to be suffering from chronic diseases, with ladies being the most affected gender. These diseases are responsible for the poor quality of life in terms of health among university students.

Morais *et al*. (2018) have studied the risk factors that are modifiable for chronic infections that are not communicable among students at the university level in Brazil. In this study, the identification of risk factors, prevalence of the chronic diseases and the relationship between risk factors and socio-economic and health aspects of students' life have been investigated. It has been found in that research that 13.7% of university students have chronic non-infectious diseases. The most prevailing diseases were found to be the respiratory, renal and cardiovascular tract, risk factors for the diseases were smoking (both active and passive), alcoholism, physical inactivity, lack of fruits intake consumption of harmful foods and sweets, while body mass index (BMI) indicated that the university students were healthy.

Ngendahayo *et al.* (2019) carried out research on university students (University of Technology and Arts of Byumba, Rwanda) to evaluate their knowledge on chronic kidney disease (CKD) and the

preventive measures adopted. A questionnaire was used as the main data collecting tool while the sample was randomly selected based on a stratified random sampling method. It was found that the mean age of the students was 29 years, about 44% had a low information level of the disease and the risk factors associated with it while more that 50% had not adopted substantial measures in preventing the disease. Only 22% were well knowledgeable on CDK risk factors and 4.6% had adopted adequate preventive measures.

Kassie *et al.* (2019) have researched on STIs among university students in Gondar University in Ethiopia based on cross-sectional study to investigate the prevalence and factors associated with the STIs. The technique applied was the multistage sampling and data collected using a questionnaire. About 53% of participants were male, about 88% were single, only 3% were non-boarding while approximately 13% were not receiving help from families and relatives but relying on themselves. Approximately 60 percent were alcohol consumers, those who smoked shisha were 6%, about 12% were khat addicts and about 76% were fans of pornographic materials. 61 percent had engaged in sexual activities, about 43 percent started practicing sex after joining university and about 24 percent engaged themselves in sex before attaining the age of 18 years. It was found out that the prevalence was at 18.2%, which is considered to be high among the students. Slightly less than 50% of the students were poorly know-ledged about STDs. Shockingly, about 47% of the ladies were infected with one or more on the STDs, 54.2 percent of the students were having many sexual partners concurrently while about 31% were under substance influence when having sex. Approximately 44% of male students had genital ulcers while about 56% of female students had vaginal discharge among those who had STI symptoms. The significant factors associated with the STIs among the students were found to be the previous history of STIs, lack of use of condoms, lack of information on STIs and multiple sexual partners. It is noted that the stakeholders need to sensitize the students on STIs, modes of transmission, use of condoms, need for seeking health services among other helpful resources.

Eni *et al.* (2019) investigated the awareness and the level of knowledge of Hepatitis B Virus (HBV) disease among university students in Nigeria based on descriptive cross-sectional and convenience sampling methods. The questionnaire was used in data collection. Results show that about 89% of the students were aged between 16 and 39 years. On a scale of 1 to 9 (1-9), the average knowledge score was about 4.85. About 57% knew that the disease is transmitted through sex, about 32% were aware of existence of a vaccine for the disease but only 21% had been previously accepted vaccination. While about 24% had multiple sexual partners, the same percentage engaged in sex that is unprotected. Even though about 70% were aware of the Hepatitis B disease, only about 46% had good knowledge of the HBV infection.

In Indonesia, knowledge on tuberculosis (TB) and the factors associated with knowledge on the same among university students has been studied by Falah *et al.* (2019). The research applied cross-sectional study design and convenience sampling technique while data collection was realized with the use of a questionnaire. Majority of the students sampled were males (62%), about 19% were married while the rest were either single or widowed, about 53% resided in rural regions and most of them (about 24%) were pursuing studies in the health field. Those who had never heard about the TB were about 5%, about 83% had not undertaken an X-ray test for TB and those who had family history with TB were about 17%. The factors gender, educational background, the field of study and past infection were significantly linked with acquiring knowledge on TB. Other factors like age of participants, ethnicity, marital status, region of residence (whether urban or rural), undertaking an X-ray test and TB screening were not associated with TB knowledge in a significant manner.

The study on tuberculosis (TB) in Ethiopia among university students was carried out by Mekonnen *et al.* (2020) based on cross-section study (using stratified random sampling-among universities- and proportional allocation technique) and a questionnaire for data collection. This research was

motivated by the previous findings that have shown that university students are nowadays at an increased exposure for TB compared to the general public due to the increasing number of students being admitted at higher learning institutions. About 64% of the students had no enough knowledge about TB with only about 32% knowing that the disease is caused by bacteria. Approximately 31% were female, majority were residing in rural areas (about 59%), most knew how the disease is transmitted from one person to another as well as the fact that TB is a communicable disease (more than 80%) and in general, most were poorly knowledgeable about the disease. The relationship between the level of knowledge on TB and background environment before joining the campuses was significant with the most knowledgeable being from urban areas and those who had stayed longer in campuses than the freshmen. About 20% were found to be part of those who would not disclose their status if found infected, 8% would feel hopeless, about 17% would feel fear, 12% are afraid of patients suffering from TB wile approximately 22% keep off the patients. Finally, the level of knowledge about TB among the students was found to vary from one university to another while majority had acquired their information from radios.

3.2 Discussion

For the case of students, the diseases have long periods and seriously disorient the students' normal life and performance, demanding time-intensive treatments and care. Research shows that, students suffer from chronic infections but the fact remains unknown even to the teachers who spend semesters with them (Muntaner *et al.*, 2014). Neither do teachers know about the repercussions of the diseases on students' life. It's seen that, due to some un-openness among students, lack of enough research on students' health, lack of a single health-centre and single medical practitioner for all students, day-to-day increasing health complexities, rising number of new diseases, among other factors, there is no enough information about chronic infections among students. Another fact from research is that most of the important information about students' health is known by students only at the university level due to the poor relationship between students and the administration. This serves as an eye-opener that students are not always healthy as is a common notion. Chronic infections among students lead to absenteeism (Muntaner *et al.*, 2014) due to hospitalizations or overprotection from their parents, among other burdens. They also lead to poor quality of life for both infected students and their families, as well as spending a lot of resources towards taking care of the infected students compared to the healthy ones. It's clear that up to about 30 percent of the students are sick and this is not a number to be ignored. The university environment is the same as that of the general public in terms of many factors including mingling and lifestyles. This means the university environment is not a special case and hence not exempted from what the general public goes through. The variety of diseases previously invading old-aged persons is now among the youth and children and therefore, when working on other groups of the community, the universities should not be isolated.

Conclusions

Health is key in any human development and operations. For one to be effective, both physically and mentally, then both physical and mental health is of paramount importance; be it a student or any other person. The increased diseases and infections of all calibre among human beings have left them not only unhealthy, restless and without peace but also made their lives miserable, unproductive, unenjoyable, too costly to bear and shortened lifetime or life expectancy. The health of university students is at risk with an alarming percentage of the students suffering. Students tend to conceal their health status and this poses more risk among the larger groups since the infected are not known. All 'scaring' diseases are nowadays a norm among the students. A search on 25 papers from the internet was analysed and all the researchers have found the university students unfree from chronic diseases. The work dismisses the notion that the students are 'ever healthy'.

Consent

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

Recommendations

Researchers to major on investigating the students not only at the university level but also at other levels of education to ensure that the stakeholders have a vivid picture of the students concerning their health, more so on chronic infections due to the burden and risk they pose on humans. At about 30% infection rate, the stakeholders need to gear their efforts towards the university students' health before it's too late. The learning institutions should strive to acquire the necessary technology for their health centres in order to save the next-immediate workforce from ill-health. The work also recommends that the students be involved in physical activities to enable them to be active and keep their bodies fit.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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