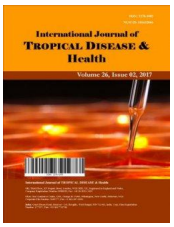

International Journal of TROPICAL DISEASE & Health

37(2): 1-12, 2019; Article no.IJTDH.49669
ISSN: 2278–1005, NLM ID: 101632866

Application of a Community Diagnosis Survey Approach to the Assessment of Adolescent Health at Korle Worko, Accra, Ghana

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Authors' contributions

This work was carried out in collaboration among all authors. Authors EMAT, EY, SAE, MA and ABO collectively designed the study, performed the analysis and wrote the first draft of the manuscript. Authors EY, SAE and MA carried out the data collection. Author EMAT managed the statistical analyses of the study and the literature searches. Author ABO worked on the GIS component edited the manuscript and corresponded to the peer review process. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJTDH/2019/v37i230162
Editor(s):
(1) Dr. Jorge Paredes Vieyra, Universidad Autonoma De Baja California, Campus Tijuana, Mexico.
Reviewers:
(1) Magda Moawad Mohamed Mohsen, Menoufia University, Egypt.
(2) Shigeki Matsubara, Jichi Medical University, Japan.
(3) Smitta Moalosi, University of Botswana, Botswana.
Complete Peer review History: http://www.sdiarticle3.com/review-history/49669

Original Research Article

Received 27 April 2019
Accepted 02 July 2019
Published 17 July 2019

ABSTRACT

Background: Adolescent health has assumed greater significance globally since adolescents bear a considerable proportion of the global disease and injury burden. Thus investing in their health can yield substantial benefit. Community surveys are useful tools for identifying the needs of adolescents and promoting their health.
Objective: This study was part of a medical education programme with the objective of identifying health and social problems of adolescents living in Korle Worko, a suburb of Accra, Ghana.
Methods: This cross-sectional study was conducted in 2015 using structured questionnaires which were administered to 729 heads of households and 228 adolescents. Weight and height

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measurements were performed on the adolescents, while key informant interviews were also conducted among community elders and adolescents. Community mapping and pair-wise matrix construction were done. The data was summarized using SPSS and Geographic Information Systems.

Results: The most commonly reported health complaints of adolescents were stomach ache, common cold, skin rashes, sadness or crying a lot, lack of concentration and hearing problems or earache. Asthma was the most common chronic diseases reported. Whereas 22.7% of the females were either overweight or obese, 7.4% of the males were overweight or obese and the difference was statistically significant (p=0.002). The spatial pattern of alcohol use correlates with drug abuse, suggesting that adolescent risky behaviour may be influenced by antisocial behaviour in the community at large.

Conclusion: Over-nutrition, under-nutrition, abdominal, respiratory and mental health problems were prominent findings in this study. Therefore, adolescent health services should target these diseases. Additionally, efforts at preventing lifestyle related risk factors should also target the areas of influence within the community.

Keywords: Adolescent health; community diagnosis survey; participatory mapping; medical education.

1. INTRODUCTION

Adolescents are young people between the ages of 10 and 19 years [1]. They are generally regarded as healthy, however, many adolescents die prematurely from preventable and treatable disease such as communicable diseases, accidents, suicide, violence, pregnancy related complications and other illnesses [1,2,3,4]. Adolescents also suffer from chronic health problems and disability [1,2,5]. In 2013, HIV/AIDS, road injuries, drowning and transport injuries were reported as the leading causes of adolescent deaths world-wide [6]. Risky health behaviours are developed during adolescence and they continue into adulthood but these behaviours can be avoided through appropriate education and the use of prevention science [2, 3,4,7,8]. These risky health behaviours include unhealthy eating habits, lack of physical activity, alcohol and substance abuse, tobacco use, violence and other antisocial behaviours [1,2,3]. Experimental sexual behaviour also occurs at this age and may lead to teenage pregnancy with its complications and sexually transmitted infections, including HIV infection [1,2,3]. The rise in HIV infection in this age group, particularly in sub-Saharan Africa, is currently a matter of grave concern [3].

Although adolescent health is often neglected, investing in adolescent health can potentially save lives now, during the life course and in the next generation [1,2]. Besides, adolescent health problems often require community-based solutions, which necessitates community engagement [1,2,9,10]. Community surveys of adolescent health have been described as useful tools for promoting adolescent health [11]. In Ghana, studies about adolescent health from a community perspective are limited and information on adolescent health at Korle Worko in particular, is inaccessible. However according to global data, adolescents in Ghana are at risk of tobacco use, limited physical activity, overweight and obesity in females [7]. Community Diagnosis involves using quantitative and qualitative research methods such as surveys, interviews and observations to describe the health of citizens and the factors which influence their health [12,13]. These factors may be social, physical or biological. This community diagnosis study was planned for Korle Worko to assess the population characteristics, health status and major health determinants of the people. During the community entry part of the preparation for the main study, adolescent health problems were reported as major issues facing the community. Thus, one of the specific objectives of the survey focused on adolescent health and sought to identify the health and social problems of adolescents living in Korle Worko. The uniqueness of this community diagnostic approach, was the inclusion of spatial mapping and participatory mapping techniques. The study was guided by the following research questions:

1. What are the most commonly reported adolescent health problems in the study area?
2. Are there significant differences in the levels of overweight and underweight between adolescent males and females in the community?
3. Are there spatial relationships between social vices in Korle Worko?

2. METHODOLOGY

2.1 Study Area

Korle Worko is a small community located in the heart of Accra, the capital city of Ghana. It is found within the central business area of the Asiedu-Kekete sub-metropolitan area. It is bordered by two major markets and is made up of an inner city population. The area is governed administratively by the local authority through the Metropolitan Assembly, headed by the Metropolitan Chief Executive. The area has an adolescent health centre located at the Ussher Polyclinic, the main government primary health care facility in the sub-metropolis. The centre was set up in 2004 to curb the high rate of teenage pregnancy occurring in the area at the time and to encourage mothers to attend the nutrition rehabilitation centre at the polyclinic when their children are referred there. The services provided at the centre include HIV counselling, family planning services, investigation of Sexually Transmitted Infections (STI's) and treatment, safe abortion, career counselling and health education. The centre has a sewing centre provided to train girls who do not wish to continue their education after basic education. However, anecdotal evidence suggests that the centre is patronised by females living outside the community rather than the local residents. Fig. 1 is a map of the Accra Metropolitan Area showing the location of Korle Worko. This is followed by Fig. 2, a Google map showing the layout of Korle Worko community.

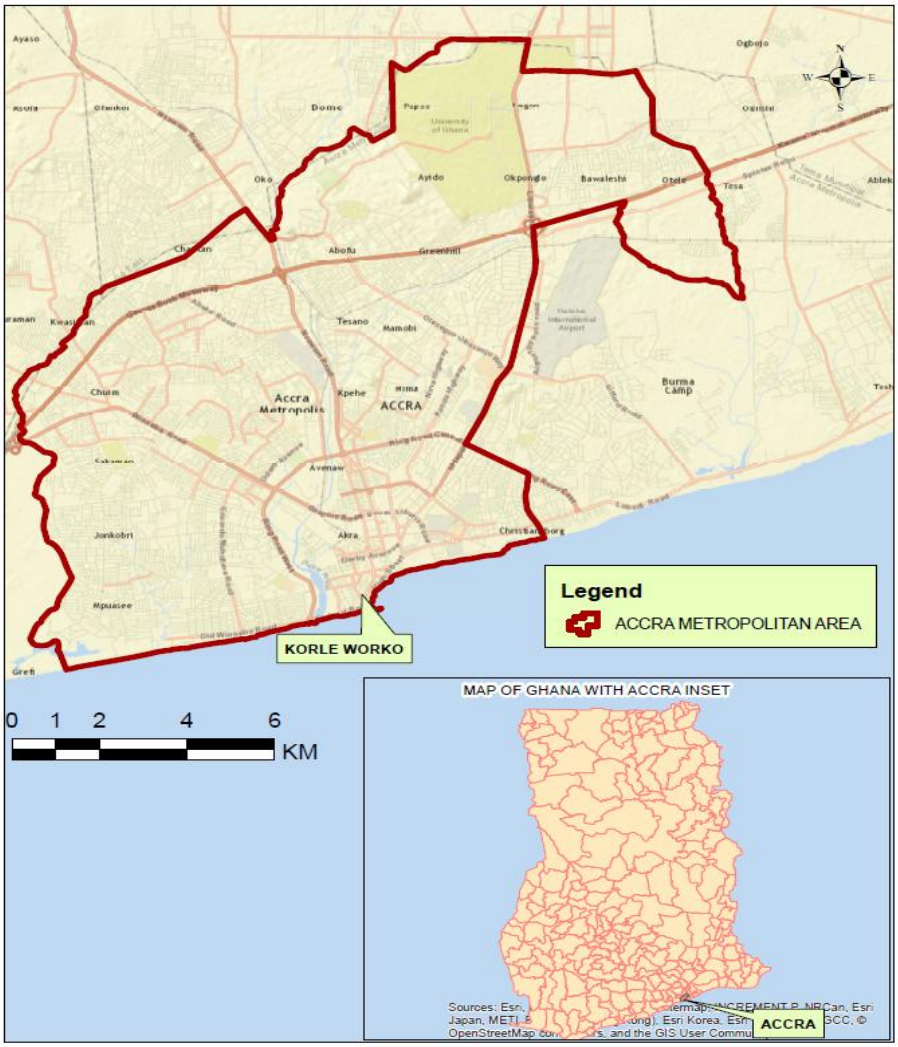

Fig. 1. Map of Accra metropolitan area (Accra) showing the location of Korle Worko

Fig. 2. Google map showing the layout of the study area

The Princess Marie Louise Children's Hospital (PML) also located in the suburb, attends to adolescents up to the age of 18 years. The hospital is known for pioneering work on malnutrition and it has the largest nutritional rehabilitation service in Ghana. The schools in the locality receive health education through the Ghana Health Service School Health Programme, the School Health Education Programme (SHEP) run by the Ghana Education Service and outreach services organised by the adolescent health centre.

2.2 Study Design and Sampling Method

A cross-sectional survey was conducted between July and September 2015 by 1st Clinical Year medical students of the School of Medicine and Dentistry, University of Ghana as part of a Community Diagnosis Survey involving households in Korle Worko. The health of adolescents in the community was investigated during the process. Quantitative and qualitative methods were used including key informant interviews and participatory mapping methods. Purposive sampling was used because of the need to avoid areas within the community which might pose a security risk.

For the purpose of this study adolescents were defined as young persons within the age group of 10 -19 years [1]. All heads of households who consented to join the survey were included, together with adolescents in their households. In the absence of the head of a household, a consenting adult, who is deemed to have ample knowledge on the subject of interest was qualified to respond. Other adolescents included in the study were those from the community who volunteered to participate in the study. The key informants were adults who lived within the community, nominated by the assembly man of the area.

2.3 Data Collection Instruments and Methods

Separate interviews were carried out with adolescents and heads of households using two different structured questionnaires. The

questionnaire administered to the heads of households contained questions on problems of adolescents as part of a series of questions on the general health of the community. The questionnaire administered to the adolescents was specifically designed to interrogate adolescent health issues. It covered conditions such as frequent illnesses, chronic diseases, smoking and drinking habits, sexual habits and felt needs of the adolescents. This questionnaire was designed by the principal investigator but it was administered by the students. They were pretested and corrected before use. The questionnaire was pretested at Ayalolo, a neighbouring community with similar characteristics as Korle Worko, also located in the Ashiedu Keteke sub-metropolitan area and corrections were made before use.

Weight and height measurements were performed on the adolescents. A Fazzini weighing scale and Harpenden Pocket stadiometer with a Spirit level were used. The height measurements were performed in centimetres and reported to the nearest 0.1 of a centimetre while the weight measurements were done up to the nearest 0.1kg. The students were taught how to perform these measurements in a separate practical session prior to the study. The students were also taught how to use their phones loaded collector for ArcGIS to obtain co-ordinates for the households they visited and to plot and interpret these coordinates using Geographic Information Systems with guidance from the Remote Sensing and Geographic Information Systems Laboratory at the Department of Geography and Resource Development, University of Ghana. Participatory Community Mapping and key informant interviews were carried out with some selected members of the community. A map was constructed with the key informants using the information they provided. It showed the areas of concentration of anti-social behaviours within the community. The information provided was also used to construct a pair-wise ranking matrix on adolescent health problems.

The completed questionnaires were checked on the field by field supervisors. The data from the adolescent questionnaires were entered into an SPSS database and analysed using SPSS version 21 to generate descriptive statistics which were presented in graphs, tables and maps. The co-ordinates for the location of the residence of adolescents in the household survey were taken and the ArcGIS software was used to map some of the responses. Students who were most skilled in the use of computers did the GIS analysis.

3. RESULTS

Altogether, 729 heads of households out of 750 responded to the question on adolescent health problems in the community. A total of 228 adolescent questionnaires were obtained and analysed. Their ages ranged from 10 to 19 years with an average of 14.6 years. Data on sex was available in 227 adolescents, including 119 (52.4%) females and 108 (47.6 %) males. The Body mass index of the adolescents measured is presented in Fig. 3. Altogether, 15.4% (35) of the adolescents were either overweight or obese. Among the females, 22.7% (27) of them were overweight or obese compared with only 7.4% (8) of the males. In addition, 11.9% (27) of the adolescents were underweight. This comprised of 6.7% (8) females and 17.6% (19) males. The difference in proportions between males and females in terms of being overweight and obese was statistically significant (p=0.002). Similarly, the difference in proportions between males and females in terms of being underweight was statistically significant (p=0.012).

The six most common health complaints reported by adolescents were stomach ache, common cold, skin rashes, feeling sad or crying a lot, lack of concentration and hearing problems or ear ache (Fig. 4). In all, 27 out of 225 (11.8%) adolescents reported chronic diseases and these were, asthma 13 (48.2%), sickle cell disease 5 (18.5%), diabetes1(3.7%), hypertension 1(3.7%), cancer 2 (7.4%), heart disease 1(3.7%) and others 4 (14.8%).

Drug and alcohol abuse were the commonest adolescent health and social problems reported by 525 (72.0%) heads of households. This report by heads of households was followed by teenage pregnancy 450 (61.7%), violence 291 (39.9%), risky behaviour 281 (38.5%) arguments with parents 232 (31.8%) and HIV/STI 79 (10.8%). In addition, during the key informant interviews, prostitution was ranked by key informants and opinion leaders or elders within the community as the most important problem adolescents face. However, it was ranked the least by the adolescents who, instead, listed violence as their most important problem (Fig. 5 and Fig. 6).

About a third of the adolescents, 75(34.3%) out of 219, admitted to alcohol use. Fifteen (7.3%)

out of 207 adolescents reported using recreational drugs, whereas,9(3.9%) out of the 228 respondents reported smoking cigarette. In all, 197 (97.0%) out of 203 adolescents reported that they engaged in some form of physical activity. The spatial distribution of adolescents who reported alcohol consumption has been presented in a GIS map (Fig. 7). Leaflets were distributed and a drama was performed by the students to illustrate the effects of these social issues during a feedback session with the community.

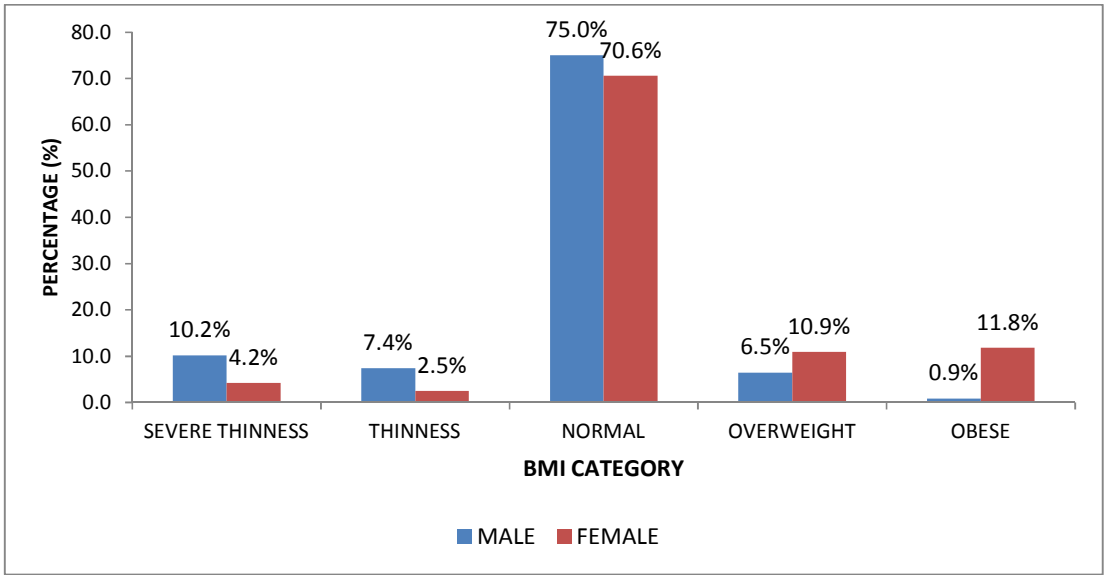

Fig. 3. Distribution of the body mass index of 228 adolescents of Korle Worko

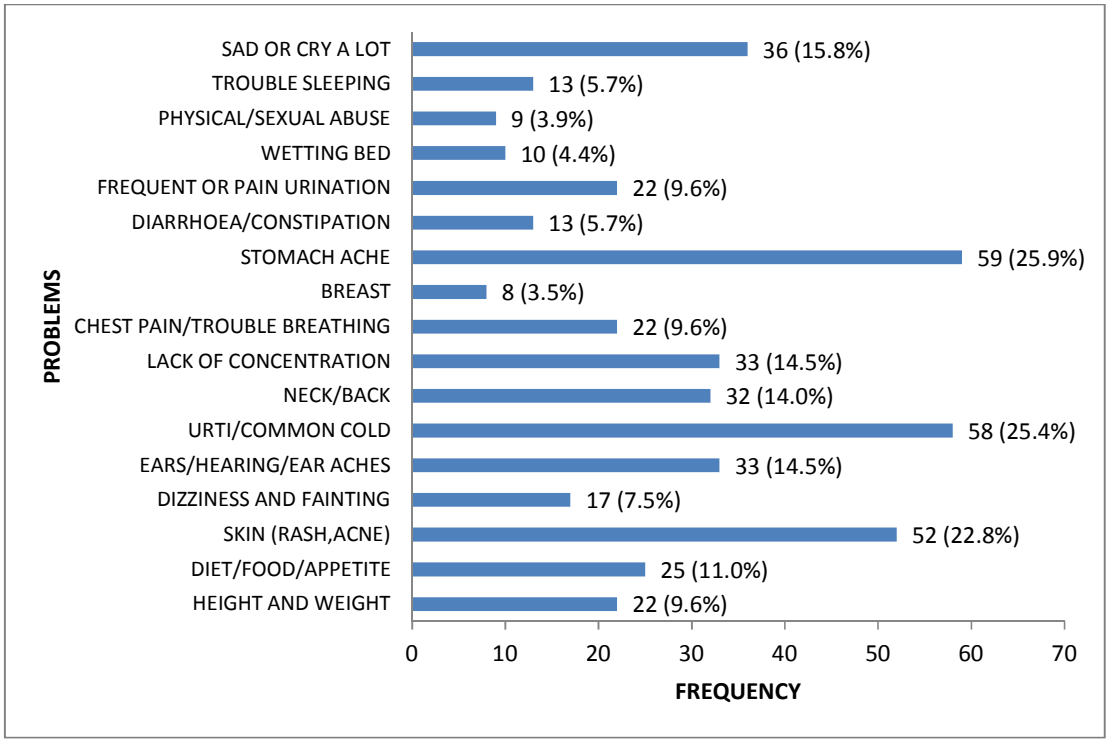

Fig. 4. Frequency distribution of health problems reported by 228 adolescents

	Drug abuse	Teenage pregnancy	School dropout	Violence	Prostitution
Drug abuse		Teenage pregnancy	School dropout	Violence	Drug abuse
Teenage pregnancy			School dropout	Violence	Teenage pregnancy
School dropout				Violence	School dropout
Violence					Violence
Prostitution					

Fig. 5. Pairwise ranking matrix showing the problems of adolescents in Korle Worko reported by adolescents in the community

	Teenage pregnancy	Drug abuse	School dropout	Violence	Prostitution
Teenage pregnancy		Drug abuse	School dropout	Teenage pregnancy	Prostitution
Drug abuse			Drug abuse	Drug abuse	Prostitution
School dropout				School dropout	Prostitution
Violence					Prostitution
Prostitution					

Fig. 6. Pairwise ranking matrix showing the problems of adolescents in Korle Worko reported at a group discussion with opinion leaders in the community

Some limitations were encountered during the study. Not all the questions received the expected number of responses as some adolescents declined to answer them. It was also not clear whether those who reported that they had Asthma had been medically diagnosed with the condition. We did not include an option for febrile conditions in the questionnaire and assumed that such a condition will be reported as other diseases; but we did not obtain such a report. Additionally since a non-probability sampling method was used, we cannot generalise our findings to other communities. As such, we have limited our conclusions to strategies that can improve adolescent health in Korle Worko.

The survey showed that close to a fifth of female adolescents in this study were either overweight or obese, while approximately one sixth of the males were underweight. Therefore, efforts must be made to curb these conditions. The children's hospital, known for its success in nutritional rehabilitation of children under five years, can be supported to become a place for nutritional interventions for adolescents. In the meantime, the adolescent centre and school health services should intensify their efforts at promoting healthy eating behaviour and, at the same time, identify and treat adolescents who are under or overweight.

4. DISCUSSION

In this study, we found both under and over nutrition which are recognised health problems affecting adolescents [1,2,3]. Furthermore, these females were found to be more at risk of obesity than adolescents in the country in general [7]. Since obesity in adolescence is likely to lead to obesity in adulthood, this observation is worrying [14]. A study of autopsies at the premier (Korle Bu) teaching hospital in Accra showed that both communicable and non-communicable diseases were important causes of deaths in adolescents [15]. Pneumonia and typhoid fever were the common infections, whereas sickle cell disease and other blood diseases, neoplasm, injuries and pregnancy related causes were among the major non-communicable diseases in the study [15]. A study on adolescent deaths in children admitted to the children's hospital (PML) also found that adolescent deaths were few; however, malaria, anaemia, HIV infection, sickle cell disease and meningitis were the most common associated diseases [16].

The common cold or upper respiratory tract infection is a common reason for outpatient attendance in Ghana [17]. Thus it may not be surprising that common cold is one of the commonly reported health problems in the study area which may be linked to vehicular pollution in the area. The study area is located in the business district of the capital, which is full of vehicular traffic during the day so it is possible that air pollution may be contributing to the preponderance of respiratory diseases among these adolescents [18]. Further studies are needed to confirm this link as well as any link this may have with earache and hearing problems, which were also common. Since pneumonia is often preceded by a cold or upper respiratory tract infection, it is important that adolescents are educated about the symptoms so they can be treated early. The term "stomach ache" is commonly used to indicate abdominal pain in Ghana. The reason for the high incidence of "stomach ache" is not known. However, stomach ache could be due to intestinal worms, food poisoning, diarrhoea diseases, typhoid fever, constipation, menstrual pain, surgical or non-organic causes; thus, it needs to be investigated further as it may provide useful information to generate a protocol for managing such complaints locally [19,20].

Feeling sad or crying a lot and bed wetting were also prominent alluding to the importance of behavioural or mental health problems among adolescents living in this setting. The need for psychosocial support during adolescence is well-documented due to the risk of depression and suicide in this age group [2,3]. Developing strong family ties, building life skills, receiving support and community programmes can mitigate this problem [1,2]. Also the listing of violence as a major issue has to be investigated further to exclude the need for stronger child protection measures. The adolescent health centre offers counselling services. Nevertheless, this service can be expanded to include a computer room, educative programmes, games and other recreational programmes for adolescents. It is also important to find out whether the adolescents actually patronize and have access to the counselling service in the community and to consider broadening the services to include enuresis management. The latter can also be done through the school health system as it occurs in other settings [21].

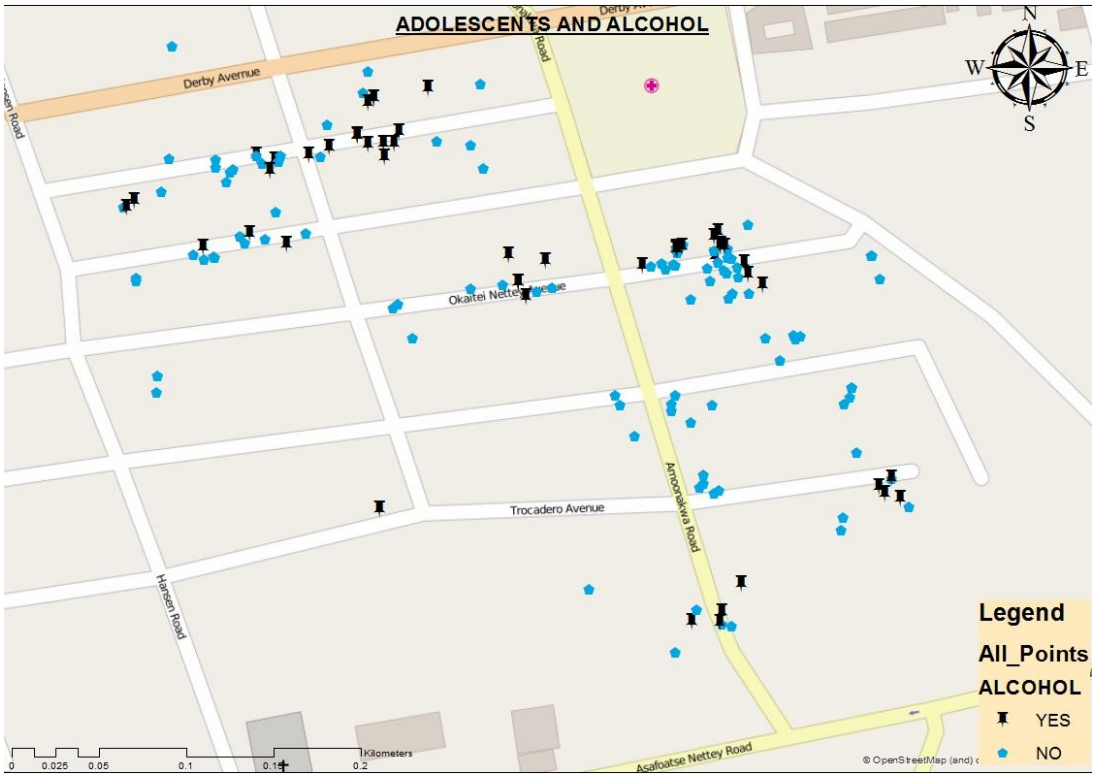

Fig. 7. Geomap of adolescents drinking pattern

Lifestyle-related risk factors for communicable and non-communicable diseases were reported to be prevalent in the community. Drug and alcohol abuse, teenage pregnancy, violence and prostitution were among the social problems reported [1,2,3]. Compared to a similar report from Ghana, adolescents at Korle Worko, of both sexes used more alcohol and are at medium risk [7]. The pattern of alcohol use among adolescents (Fig. 7) was similar to the spatial distribution of social vices like drug abuse in the community. This suggests that adolescent risky behaviour may be influenced by antisocial behaviour in the community at large. A similar observation has been made by other researchers [22]. Consequently, efforts to address the problem should not only focus on adolescents but also on other social vices and adults who engage in them.

Sexual promiscuity in the form of prostitution was reported to be a significant problem of adolescents in the pair wise ranking matrix by the opinion leaders. However, prostitution was not viewed as a major problem by the adolescents so this requires further study. The convention on the rights of child engenders society to listen to adolescents on matters relating to their health [23]. Since parents and guardians, family, schools, community members and religious leaders also play a significant role in guiding adolescents, their views also matter. However, it is important to seek both views and create an opportunity for dialogue when seeking solutions, since they may differ. Nonetheless, sexual promiscuity is a well-recognised risky behaviour among adolescents and it puts them at risk of teenage pregnancy and sexually transmitted infections such as Chlamydia, gonorrhoea and HIV/AIDS [2,24]. The occurrence of sexually transmitted infections (STI) is further suggested by the reporting of increased frequency and painful urination by 9.6% of the adolescents. Services to manage STI's are available at the adolescent health centre, the outpatients and children's hospital. Education on the subject should also be carried out in schools and the community.

Community diagnosis is a useful educational tool for introducing medical students to research and the community, as it has several benefits [12,13,25]. It enables students to learn how to gather and critically appraise health and social data, identify health problems, generate solutions, interact with the community and suggest ways of improving their health [25,26]. An appraisal of a similar project recommended the use of more participatory research methods and GIS to improve the learning experience in subsequent surveys as it is done elsewhere [26, 27,28]. It also called for increasing student participation in problem-solving studies to increase the benefits of the exercise to communities [26,29]. This survey provided an opportunity for students to do this. The students were taught to obtain GIS co-ordinates, construct GIS maps and use more participatory research methods. A song, a rap and drama on adolescent health issues created by the students using principles of health education were staged during feedback to the community at a durbar. Leaflets and posters were also made and distributed. A member of staff of the department was tasked to continue to support the adolescent centre through health promotion. Additionally, the department of Community Health initiated steps to invite United Nations Population Fund (UNFPA) to partner with the adolescent health centre at Ussher Polyclinic to address adolescent health issues in the sub-metropolis. The UNFPA collaborated with the adolescent health centre and the department of Community Health to organize outreaches and made renovations to the centre which was commissioned in early 2019.

Student participation in problem solving at the community level is often limited by inadequate resources and time constraints as their rotations are usually time bound [26]. This example demonstrates that with some guidance, community diagnosis can contribute solutions using modest resources, creativity and innovation. We have replicated some of this in other community projects including providing reports that have enabled communities to obtain much needed infrastructure. We hope to add activities such as health screening in future. Since universities are partly rated by the positive impact they exert on communities, community diagnosis by medical students can be seen as one of the avenues for achieving this and meeting their social responsibility [28].

5. CONCLUSION

Both communicable and non-communicable diseases, particularly respiratory conditions were reported as prominent health problems among these adolescents. Over and under-nutrition as well as mental health problems were also prominent. Although the area is well endowed with health services to address these issues,

they may need to be expanded and reoriented to target specific conditions such as nutrition in adolescence, respiratory diseases and mental health problems. Efforts at addressing the lifestyle related issues should also target areas of influence within the community. Further investigation of the pattern of use of the services available to adolescents, risk factors for respiratory diseases and the causes of stomach ache are required. Community Diagnosis if used this way can become a useful tool for providing exposure as well as solutions to global health issues affecting communities in Ghana and elsewhere.

CONSENT AND ETHICAL APPROVAL

Community entry was done and permission to carry out the survey was obtained from the Assembly man at the time, Mr. Alfred Nii Kortey Ashie who sought permission from the traditional authorities on behalf of the department. Written consent was obtained from the heads of household before the questionnaires were administered and adolescents also gave verbal permission to be interviewed.

ACKNOWLEDGEMENT

Our acknowledgement goes to the School of Medicine and Dentistry, University of Ghana for their immense support. Also to the Class of 2018, School of Medicine and Dentistry, University of Ghana who spent greater part of their field study time collecting data for this publication; especially Michael Adomako, Raymond Ametorwo, George Akwetey Jnr, George Ahene-Amanquanor, Frederick Yebuah and.Hajara Abdel-Majeed. Finally we also want to acknowledge the important role played by the Remote Sensing and GIS Applications Laboratory, Department of Geography and Resource Development, University of Ghana.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
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