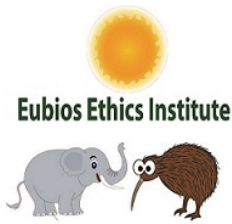


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Editorial: Health and Technology

This issue of *EJAIB* considers themes in health and technology with papers from Tanzania, Canada, Indonesia and two others addressing general philosophical issues of bioethics.

Technology can bring about many benefits for users if they have access to services. The first paper by Dr. Josephine Mwakisambwe and colleagues presents an analysis of knowledge and access to cancer services, and in particular, Esophageal Cancer, in rural Tanzania. Similar circumstances may exist in many countries, and effective public health programs can also reduce the incidence of cancer. Although there are also public education programs in many countries, the effectiveness of these programs is unclear.

Michael Tai and Phyllis Hsu take us back to the origins of bioethics, and how the bioethics of Fritz Jahr, the first person to actually use the term Bioethics, in 1927, can be useful for persons in Asia, and around the world, as they contemplate the question of euthanasia.

Syeda Farwa Naqvi and Gregor Wolbring review the literature on HIV/AIDS Health Promotion, which is just as critical as it was two eacdes ago, even though soe complanaceny is seen because of the greater access to antiretoriiral drugs nowadays that may allo persons living with HIV to maintin a reasonable quality of life (QOL). Guntur Heri Putranto and Winny Setyo Nugroho review the literature on Sharp Safety, and found seven key elements for the curriculum.

Osebor Ikechukwu Monday asks whether organ farming is a panacea to the Organ Crisis, or whether it is unacceptable. There are many views on where we can obtain organs to save human life, and whether xenotransplanatation is an ethical solution to overcome the organ shortage. Osebor writes from a Nigerian perspective on some of these questions, with broad applicability.

. - Darryl Macer

Ethics and Risk Factors for Esophageal Cancer & Awareness of Cancer Related Health Services Among Adults in Rural Kilimanjaro, Tanzania: A Prerequisite for Cancer Down Staging

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Abstract

The mortality and morbidity resulting from non-communicable diseases including cancer in sub-Saharan Africa are predicted to overtake that of infectious diseases by the year 2030. Esophageal cancer is on the increase in Tanzania. This study estimates risk factors for esophageal cancer, ethical issues and the level of awareness of cancer related services among adults in rural Kilimanjaro. A cross sectional descriptive study was conducted of adults aged 18 years and above in three wards, namely, Kahe, mabogini and Arusha Chini, Moshi Rural District, Kilimanjaro region. Face-to-face interviews were conducted with a total of 419 individuals. The mean age was 36.47 (standard deviation (SD) =13.49) years. Of those who participated, 211 (50%) were male and 60% reported to have completed primary education. A majority (71%) of participants were knowledgeable about esophageal cancer risk factors. Overall, 15% and 23% of the participants reported to have been smoking and drinking alcohol, respectively. Male respondents were almost three times more likely to be smokers as compared to female respondents (OR=2.696; 95%CI: 1.372, 5.299; p=0.004). Moreover, people who were self-employed were about five times more likely to be smokers as compared to those who were unemployed. (OR= 4.847; 95%CI: 1.019, 23.05; p=0.047). Male respondents were almost two times more likely to be drinkers as compared to female respondents (OR=1.918; 95%CI: 1.097, 3.351; p=0.022). Overall, the level of awareness of cancer related health services was about 70%.

The study findings confirm that despite a good level of knowledge about risk factors for esophageal cancer, the practice of exposure to risk factors is alarmingly high. Awareness of where to seek cancer related health services was high with hospitals been mentioned by the majority though there was low understanding on

modalities of treatment among adults in Rural Kilimanjaro. Intervention measures should aim at further increasing knowledge of cancer risk factors and reduce the practice of such risks. Ethical matters including truth telling, ageism and autonomy need to be addressed to improve the perception of cancer related health issues and health seeking behaviour.

1. Introduction and Objectives

Cancer is one of the Non-communicable Diseases (NCDs) that are becoming a public health problem globally. It is an increasing problem in Africa because of aging and growth of the population as well as increased prevalence of risk factors associated with smoking, alcohol, obesity, physical inactivity, and reproductive behaviors, and of certain infectious agents of importance in cancer etiology. Cancer affects the majority of the body parts including the esophagus. Symptoms often include difficulty in swallowing and weight loss. Other symptoms may include pain on swallowing, a hoarse voice, enlarged lymph nodes (glands) around the collarbone, a dry cough, and possibly coughing up or vomiting blood. Cancer is among the causes of morbidity and mortality worldwide, with approximately 14 million new cases and 8.2 million cancer related deaths in 2012 expected to rise to 22 within 20years (WHO, 2014).

Esophageal cancer (EC) is one of the least studied and deadliest cancers worldwide and it is the sixth among all cancers in mortality (Res., 2011; Practice, 2008). Esophageal cancer types include squamous cell carcinoma and adenocarcinoma. Studies show that, smoking, drinking hot tea, red meat consumption, poor oral health, low intake of fresh fruit and vegetables, and low socioeconomic status are some of the risk factors of esophageal cancer. Furthermore, Barrett's esophagus is clearly recognized as a risk factor for the cancer, and dysplasia remains the only factor useful for identifying patients at increased risk, for the development of esophageal adenocarcinoma in clinical practice (Yuwei, 2013).

Esophageal carcinoma affects more than 450,000 people worldwide with rapid increase and about 75% of the cases diagnosed in Asia (Siegel, 2015). The overall 5-year survival of patients with esophageal carcinoma ranges from 15% to 25%. Diagnoses made at earlier stages are associated with better outcomes than those made at later stages (Pennathur, 2013).

In Africa, there are 715,000 new cases and 542,000 cancer deaths annually (Jemal, 2008). Malawi has highest number of cases of EC of 24 per 100,000. In Sub-Saharan Africa, it was the 5th commonest cancer with 15,150 male cases and 7,200 female cases estimated to occur in 2002. Esophageal cancer is increasing in the Sub-Saharan African Region and varies geographically. This is due to various reasons such as lack of awareness and knowledge on the disease in the public globally (FitzGerald, 2008; Hemantha, 2010; Duron, 2013).

According to the report done at Ocean Road Cancer Institute (ORCI) for the period between 2006 and 2009, the number of new cases of EC per year increased from 181 per year in 2006 to 307 cases per year in 2009 (Mamsau, 2013). Oncologists at ORCI have noted a higher number of EC patients referred from the Kilimanjaro region than other regions of Tanzania,

despite similarities of population between regions, distance between the consultant hospital in the region and ORCI, and quality of roads between the consultant hospital and ORCI. It is shown that Male patients 55 years and older had higher incidence of esophageal cancer than female and younger patients (Ngoma, 2016).

The majority of esophageal cancer patients in Tanzania are diagnosed at advanced disease stages (stage III and IV) at palliative stage when little can be done (70-80% of the cancers) despite the efforts done by the Government through MNH and ORCI and other cancer screening programs that play part in treating cancer patients (Ngoma, 2006). These increased number of esophageal cancer cases have led to the increased early/ premature deaths, increased morbidity, increased disability and social discrimination.

Studies have shown there is poor knowledge of cancer in Kenya and other developing countries. Due to a lack of structured health education programs, it is assumed that knowledge of cancer and its associated symptoms, and risk factors is also poor in this region of Kenya (Duron, 2013). However, there is limited information on the prevalence of risk factors and knowledge of EC and awareness of cancer related health services in Tanzania. It is also not known the extent to which people understand the risk factors for EC to inform development of educational materials. Therefore this study will show the prevalence of risk factors and knowledge of esophageal cancer and illuminate on the ethics and awareness of cancer related health services among adults living in Rural Kilimanjaro, Tanzania.

Socio-economic-demographic characteristic e.g. sex, gender, occupation, income, level of education and history of having a relative who had Esophageal cancer can influence the knowledge on EC and practice of risk behavioral factors of esophageal cancer e.g. smoking, alcohol intake directly. But also knowledge of EC may have an influence the practice of risk behavioral factors of EC directly. These may also determine accessibility of health facilities. Accessibility of health facilities may also determine the knowledge and behavioral factors through the education and treatment offered at the hospital.

This study will assist knowing the extent of risk of which will help the policy makers to identify geographic areas needing special consideration. Also the study will help in knowing the risk factors and its determinants that will help in designing intervention measures to address EC. Ethical matters surrounding will also be illuminated in hope that policy makers will tackle such said issues. Lastly, the findings will help to downstage cancer. This is the first study in Tanzania to provide such information for Kilimanjaro region.

The main objective is to determine the level of knowledge and extent of practice of esophageal cancer risk factors among adults in rural Kilimanjaro region, and what is the level of awareness of and ethical issues facing cancer related health services among adults in Rural Kilimanjaro. Specific objectives include:

1. To determine the level of knowledge of esophageal cancer risk factors among adults in Kilimanjaro.
2. To determine the practices associated with esophageal cancer risk factors among adults in Kilimanjaro.
3. To identify the determinants of practice of selected

(smoking and alcohol consumption) esophageal risk factors among adults in Rural Kilimanjaro, Tanzania.

4. To assess the level of awareness of and ethical issues facing cancer related health services among adults in rural Kilimanjaro, Tanzania.

2. Risk Factors for Esophageal Cancer

2.1. Red meat (Diet)

Red meat might be directly one of the risk factors of colorectal and esophageal cancers or indirectly because diets high in meat may be deficient of other dietary components such as fibre and polyphenols from fruit and vegetables. Cooking meat at high temperatures may lead to the formation of mutagenic and carcinogenic heterocyclic amines through the interaction of muscle creatinine with amino acids as well as the formation of N-nitroso compounds. Frying, grilling, broiling or cooking on coal can potentially induce these changes. Haem in meat can act as a nitro sating agent promoting the formation of N-nitroso compounds. Darker meats are more abundant in haem than white meats and therefore, high consumption of red meat (beef, pork, or lamb) could increase the risk of colorectal and esophageal cancers. Haem iron has been positively associated in the literature with the development of colonic polyps, adenomas and esophageal and colorectal cancers (Pericleous, 2013) (Amanda, 2011) (Salehi, 2013).

But a diet rich in fruits and vegetables which contain zinc and selenium reduces the risk of esophageal cancer. Hence the habit of eating fruits and vegetables is a protective habit from getting esophageal cancer (Wu, 2010). These foods contain many anti-carcinogenic substances, such as vitamins, carotenoids and flavonoids. Possible mechanisms of action include modulation of Deoxyribonucleic Acid (DNA) methylation, protection from and repair of DNA damage, induction of detoxifying phase II enzymes and promotion of apoptosis. A recent expert report concluded that consumption of vegetables and fruits probably protects against development of esophageal and gastric cancer (Steevens, 2011; Stephanie, 2010; Torin, 2015).

2.2. Obesity

Obesity is an increased risk of several types of cancer such as; cancers of the breast (in women who have been through menopause), colon, rectum, endometrium (lining of the uterus), esophagus, kidney, pancreas, and gallbladder. Therefore, eating a healthy diet, being physically active and keeping a healthy weight may help reduce risk of some cancers (NCIS, 2015). Being overweight and obesity have been directly related to esophageal adenocarcinoma, but not to squamous cell carcinoma. The influence of obesity on esophageal adenocarcinoma and gastric cardia adenocarcinoma is related to higher incidence of gastro-esophageal reflux in obese persons since the risk of gastro-esophageal reflux is related to the risk for Barrett's esophagus (L.R., 2010).

2.3. Age

Age is the most important risk factor for many cancer types. According to the National Cancer Institute's Surveillance, Epidemiology, and End Results program, the median age of cancer diagnosis is 66 years. Although the common age of most cases of esophageal cancer is 50

years (NCIS, 2015). A study in Tanzania was carried out that showed that Male patients 55 years and older had higher incidence of esophageal cancer than female and younger patients (Ngoma, 2016).

2.4 Alcohol

Alcohol can increase your risk of cancer of the mouth, throat, esophagus, colorectal, larynx (voice box), liver, and breast. The more you drink, the higher your risk. The risk of cancer is much higher for those who drink alcohol. (Pelucchi, 2011). According to data from 2009, an estimated 3.5 per cent of all cancer deaths in the United States (about 19,500 deaths) were alcohol related (NCIS, 2015). A study in China was done and about 15.2% of esophageal cancer deaths in men and 1.3% in women were caused by alcohol drinking.

2.5 Exposure to smoke (smoking, cooking, charcoal burning and others)

Tobacco use is a leading cause of cancer and of death from cancer. People who use tobacco products or second-hand smoke have an increased risk of cancer because tobacco has many chemicals that damage human DNA. Tobacco use causes 20% of global cancer deaths. Tobacco use causes many types of cancer, including cancer of esophagus (WHO, 2014; Jon, 2013). The risk of esophageal adenocarcinoma is approximately twice as high among current smokers as it is among people who have never smoked, but smoking causes more of esophageal squamous-cell carcinoma than esophageal adenocarcinoma (Rustgi, 2014). Excessive use of fuels such as kerosene, wood, charcoal, coal or anthracite in enclosed places with limited air supply may lead to esophageal cancer due to emission of carcinogenic polycyclic aromatic hydrocarbons (PAHs), such as benzo[a]pyrene (BaP) (Pacella-Norman, 2002).

2.6. Exposure to pesticide use in agriculture

Also unsafe use of pesticides has been shown to be one of the risk factors of esophageal cancer (Bonner, 2012).

2.7. Radiation

Radiation of certain wavelengths, called ionizing radiation, has enough energy to damage DNA and cause or treat cancer. Ionizing radiation includes radon, x-rays, gamma rays, and other forms of high- energy radiation (NCIS, 2015). Esophageal cancer is a radiation dose-related complication of radiotherapy for breast cancer, but absolute risk is low (Morton, 2012).

2.8. Beverages

Studies show that both green tea and coffee consumption, but not black tea consumption, have protective effects on esophageal cancer (Ju-Sheng, 2013). Also hot drinks contribute to the chances of getting esophageal cancer since they cause destruction of DNA of cells.

2.9. Gastro-esophageal reflux disease

Gastro-esophageal reflux disease (GERD is a chronic condition that affects 10-26% of the general population. It presents with acid regurgitation which in long term may cause esophageal ulceration, fissures, bleeding, strictures and the pre-malignant Barrett's esophagus.

Other symptoms include heartburn, water brash which are precipitated by local food such as banana meals, beans and food spices (Mwita, 2014).

2.10 Genetic risk factors

Familial clustering in Barrett's esophagus and adenocarcinoma has been observed. In one genome wide, combined linkage-association analysis, germ line mutations were identified in one of three candidate genes Mutant macrophage scavenger receptor 1 (MSR1), Activating signal cointegrator 1 complex subunit(ASCC1), and Collagen triple helix repeat containing 1 (CTHRC1) in 11% of patients with Barrett's esophagus or adenocarcinoma. MSR1 is associated with cyclin D1 over expression, which results in more rapid cell-cycle progression. In another genome wide association study, susceptibility loci for Barrett's esophagus and adenocarcinoma were identified in CREB-regulated transcription co-activator (CRTC1), BARX Homeobox 1 (BARX1) which encodes a protein involved in esophageal specification, and Forkhead box protein P1(FOXP1) which encodes a protein involved in esophageal development (Rustgi, 2014).

2.11 Prevention

Several observational, clinic-based cohort studies have shown a significant association between treatment with proton-pump inhibitors and a decreased risk of high-grade dysplasia and adenocarcinoma in patients with Barrett's esophagus, although limitations of these studies included possible selection bias (Rustgi, 2014).

Other studies show a 40 to 50% reduction in the risk of esophageal adenocarcinoma and squamous- cell carcinoma with aspirin or non-steroidal anti-inflammatory drug (NSAID) treatment. Given the additional cancer reducing benefits of aspirin and NSAIDs, these medications have been recommended for general cancer chemoprevention in high-risk group (Rustgi, 2014)

A meta-analysis of 13 studies involving humans showed a 28% reduction in the risk of esophageal adenocarcinoma among overall statin users, as compared with nonusers, and a 41% reduction in the risk of esophageal adenocarcinoma among patients with Barrett's esophagus. However, there was considerable inconsistency in these studies and no clear associations with dose, duration, or statin type (Rustgi, 2014).

Esophageal cancer could be prevented through the application of existing cancer control knowledge, and by implementing programs for tobacco control, and early detection and treatment, as well as public health campaigns promoting physical activity and healthier dietary patterns (Jemal, 2011).

2.12 Treatment

The disease is diagnosed by biopsy done by an endoscope (a fiberoptic camera) (Stahl, 2013). Endoscopic eradication therapy with radiofrequency ablation significantly reduces the frequency of progression to cancer for patients with high-grade dysplasia. The treatment of the cancer maybe surgical (esophagectomy) or non-surgical depending on the stage of the disease. There are two types of non-surgical therapies which are chemotherapy and radiotherapy.

Chemotherapy depends on the tumor type, but tends to be cisplatin-based (or carboplatin or every three weeks with fluorouracil (5-FU) either continuously or every three weeks. Chemotherapy may be given after surgery, before surgery or if surgery is not possible. Radiotherapy is given before, during, or after chemotherapy or surgery, and sometimes on its own to control symptoms. Treatment with a curative intention is restricted to localized disease, without distant metastasis: in such cases a combined approach that includes surgery may be considered. Disease that is widespread, metastatic or recurrent is managed palliative. Early detection of symptoms of esophageal cancer is associated with an increased likelihood of early diagnosis of cancer. Hence making curative treatment feasible (Jones, 2007).

3. Methodology

3.1. Sample Selection

The Kilimanjaro Region is one of Tanzania's thirty one administrative regions. The regional capital is the municipality of Moshi. According to the 2012 national census, the region had a population of 1,640,087, which was lower than the pre-census projection of 1,702,207. For 2002-2012, the region's 1.8 percent average annual population growth rate was the 24th highest in the country. It was also the eighth most densely populated region with 124 people per square kilometer. The population is mainly comprised of the Chaggas. The region comprises of seven districts namely; Hai, Moshi Rural, Mwanza, Moshi Municipal, Rombo, Same and Siha.

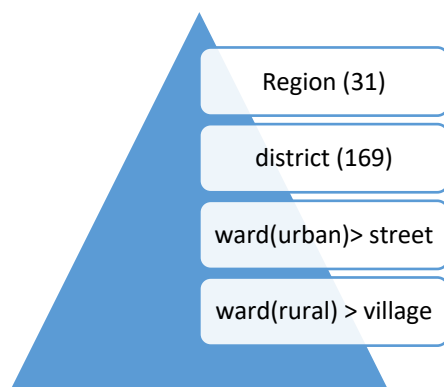


Figure 1: Tanzania administrative regions

The study was conducted in the wards of Moshi rural District, Kilimanjaro region (Kahe, Mabogini and Arusha Chini). The Kilimanjaro region has relatively well-off communities with increased practice Non-Communicable Disease related life styles behaviors such as drinking local brew especially among Chaggas. Furthermore, use of pesticides for coffee and rice plantation is common predisposing these communities to high risk of cancer. Hence there are higher cases of esophageal cancer. The area was also selected due to a good network of health facilities necessary for the planned referral system of the cases.

The study population was adults (18 years and above). With a reported prevalence of 47% who were not aware and knowledgeable about EC (Duron, 2013), the estimated sample size of the study was 383 adults. Due to estimated non-response of ten percent, the minimum numbers of adults recruited for the study was

426 adults.

Purposive sampling technique was used to select the region and the wards; Kahe, Mabogini and Arusha Chini wards of Moshi rural District were selected conveniently. In each ward, the list of people aged above 18 years were obtained from the ward council office and the number of people from each ward were chosen from the list using systematic sampling technique. In the event that the selected person was ineligible, the next person in the list was chosen until the sample size estimated was attained.

Inclusion criteria: The adults living in households in the community in Rural Kilimanjaro and willing to participate in the study

Exclusion criteria:

1. Adults who were severely ill and could not participate in the study.
2. Patients who had already been diagnosed with EC or any other cancer in the community
3. Adults who were health professionals in the community

3.2. Research instrument

A structured questionnaire consisting of closed and open ended questions with a consent document was used. These tools were translated into Kiswahili to obtain data from the study participants and to ensure they understood the contents properly. It contained questions to explore socioeconomic demographic characteristics of respondents, respondents' knowledge and practice of risk factors of esophageal cancer and awareness of cancer health related services (It is available from the first author).

The Swahili version interview schedule was pre tested in the field to know if it would be clearly understood by the respondents and if corrections arose they would be made for better understanding of the respondents without changing the meaning. This was conducted in Kibaha focusing on the duration of interview, types of questions.

3.3. Ethical clearance and permission processing

The protocol for this study was approved by American University of Sovereign Nations (AUSN), School of Medicine Institutional Review Board (IRB). The approval was on the agreement that participation in the study must be voluntarily. Also the participants were explained about the study. Permission to conduct the study was sought from the District Executive secretary and selected Ward Executive Officers. Through village leaders, the participants (adults) were informed about the study at least two days before the actual day for data collection. Confidentiality of all study participants was assured. Everybody was informed that no names or direct identification made to the questionnaire except numerical identification.

3.4. Data collection procedures

Face-to-face interviews were conducted using a semi-structured questionnaire. Data was collected on daily basis from morning to evening except the weekends until the number required in each facility was obtained. The questionnaire had both closed and open ended

questions. The closed ended questions provided more structured responses and open ended questions provided additional information. The interview started with introduction after receiving permission from the village authority. Then with the acquisition of consent from the participants. Introduction and consent from the participants. Assurance of confidentiality was made to the participants.

Table 1: Distribution of socio-demographic characteristics of study participants, among the Wards and the Total (N=419)

Variables	Kahe	Mabogi ni	Arusha Chini	Total
<i>Sex</i>	N (%)	N (%)	N (%)	N (%)
Male	77(46)	93 (56)	41 (48)	211(50)
Female	91 (54)	73 (44)	44 (52)	208(50)
<i>Age Group</i>				
18-45yrs	123(73)	126 (76)	68 (80)	317(76)
46-59yrs	32 (19)	26 (15)	15 (18)	73 (17)
60 + yrs	12 (8)	15 (9)	2 (2)	29 (7)
<i>Education level</i>				
Not attend	13 (8)	3 (2)	4 (5)	20 (5)
Primary	97 (58)	100 (60)	49 (58)	246(59)
Secondary	47 (28)	45 (27)	24 (28)	116(28)
Tertiary	11 (7)	18 (11)	8 (9)	37 (9)
<i>Occupation</i>				
Employed	14 (8)	38 (23)	20 (24)	72 (17)
Peasant	79 (47)	65 (39)	19 (22)	163(39)
Self employed	57 (34)	4 (2)	2 (2)	63 (15)
Unemployed	18 (11)	59 (36)	44 (52)	121(29)
<i>Monthly income e(TZS)</i>				
< 50000	98 (58)	96 (58)	53 (62)	247(59)
50-100,000	41 (24)	26 (16)	8 (9)	75 (18)
> 100000	29 (17)	44 (27)	24 (28)	97 (23)
<i>Marital Status</i>				
Single	56 (33)	39 (24)	28 (33)	123(29)
Married	82 (49)	118 (71)	52 (61)	252(60)
Separated	11 (7)	8 (5)	4 (5)	23 (6)
Divorced	4 (2)	0	0	4 (1)
Widowed	15 (9)	1 (1)	1 (1)	17 (4)

Collection of data from the participants was performed in the household in a private room for 20 minutes. This activity was conducted for three to four weeks. After collection of data, filled-in interview schedules were checked for completeness and consistency of the responses. Only the interview schedules that were properly and completely filled were analyzed. Open

ended questions were post-coded and entered on the interview schedule. Data entry and analysis were done using statistical package for social sciences (SPSS) version 18.

Data analysis was carried out by running descriptive statistics and Cross tabulations. Comparison between propositions were done using chi square test while t-test was used to compare differences between means. Multivariate logistic regression analysis examined for independence association between our outcome variable (EC risk factors which were alcohol, cigarette smoking, drinking of hot beverages, exposure to pesticides, red meat consumption) and various predictors (Socio-economic-demographic characteristics, Health system factors e.g. accessibility of health facilities, screening, referral system, Past medical history of esophageal cancer in the family). A p- value of less than 0.05 was considered statistically significant for the association between independent variables and dependent variables

4. Results

4.1. Socio-demographic characteristics

Refer to Table 1.

4.2. Level of knowledge on risk factors

4.2.1. Level of knowledge on smoking as risk factor for esophageal cancer

Of all participants interviewed, 84% were knowledgeable about smoking as a risk factor for esophageal cancer. The proportion knowledgeable was higher among male (53%) than female (47%) (P=0.04). This level of knowledge did not differ by A total of 419 individuals participated in the study and the mean age was 36.47 (standard deviation (SD) =13.49) years. Of those who participated, 211 (50%) were males, and 60% reported to have completed primary education. Most of them were Peasants (39%) and unemployed (29%) mostly with a monthly income of less than TZS.50000. The general characteristics are presented in Table 1.

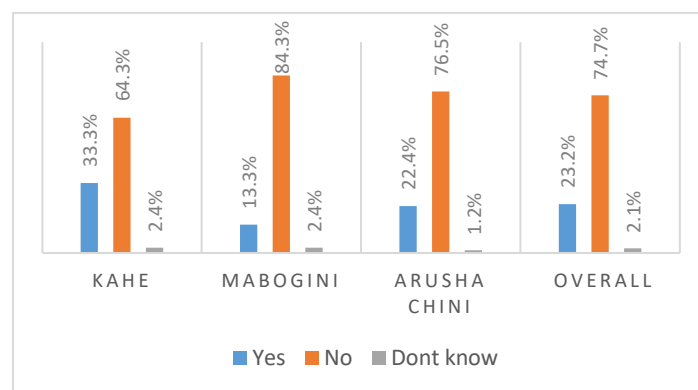


Figure 2. Reported family history of esophageal cancer in lower Moshi, Kilimanjaro region

4.2. Level of knowledge on risk factors

4.2.1. Level of knowledge on smoking as risk factor for esophageal cancer

Of all participants interviewed, 84% were knowledgeable about smoking as a risk factor for esophageal cancer. The proportion knowledgeable was higher among male (53%) than female (47%) (P=0.04).

This level of knowledge did not differ by

Table 2: Knowledge of smoking as a risk factor for esophageal cancer among adults in lower Moshi, Kilimanjaro (N=419)

Variables	Yes %	No %	Total N (%)	p-value
<i>Name of the ward:</i>				
Kahe	41.7	31.9	168(40)	
Mabogini	39.1	42.0	166(40)	0.24
Arusha Chini	19.1	26.1	85(20)	
<i>Sex</i>				
Male	52.6	39.1	211(50)	
Female	47.4	60.9	208(50)	0.04
<i>Education level</i>				
Not attended	5.4	1.5	20(5)	
Primary	56.6	69.6	246(59)	0.07
Secondary	28.0	26.1	116(28)	
Tertiary	10.0	2.9	37(9)	
<i>Family history of esophageal cancer</i>				
Yes	24.6	15.9	97(23)	
No	73.4	81.2	313(75)	0.28
I don't know	2.0	2.9	9(2)	
<i>Marital status</i>				
Single	28.9	31.9	123(29)	
Married	60.0	60.9	252(60)	
Separated	6.3	1.5	23(5)	0.579
Divorced	0.9	1.5	4(1)	
Widowed	4.0	4.4	17(4)	
<i>Monthly income (TZS)</i>				
<50000	58.3	62.3	247(59)	
50-100,000	18.0	17.4	75(18)	0.793
> 100000	23.7	20.3	97(23)	

A total of 419 individuals participated in the study and the mean age was 36.47 (standard deviation (SD) =13.49) years. Of those who participated, 211 (50%) were males, and 60% reported to have completed primary education. Most of them were Peasants (39%) and study ward ($p=0.24$), marital status (0.579), monthly income ($p=0.793$) and education level ($p=0.07$) 25% of those who considered smoking as a risk factor for EC had a family history of EC compared to 75% of those who reported to have no family history of esophageal cancer ($p=0.28$).

4.2.2. Level of knowledge on alcohol as risk factor for esophageal cancer

Of all participants interviewed, 61% were knowledgeable about alcohol as a risk factor for esophageal cancer. The proportion knowledgeable was higher among male (54%) than female (46%) ($P=0.086$). This level of knowledge differed by study ward

($p<0.001$) and family history of esophageal cancer ($p=0.019$) but it did not differ by marital status ($p=0.923$) and monthly income ($p=0.099$). The results are shown in Table 3. 54% of those with primary education considered alcohol as a risk factor for esophageal cancer compared to 6% of those had never attended school ($p=0.22$).

Table 3: Knowledge of alcohol as a risk factor for esophageal cancer among adults in lower Moshi, Kilimanjaro (N=419)

Variables	Yes %	No %	Total N (%)	p-value
<i>Name of the ward</i>				
Kahe	48.2	27.4	168(40)	
Mabogini	40.8	37.8	166(40)	<0.001
Arusha Chini	11.0	34.8	85(20)	
<i>Sex</i>				
Male	53.7	45.1	211(50)	0.086
Female	46.3	54.9	208(50)	
<i>Education level</i>				
Not attended	5.9	3.1	20(4.8)	
Primary	53.7	66.5	246(59)	0.22
Secondary	29.0	25.6	116(28)	
Tertiary	11.4	4.9	37(9)	
<i>Family history of esophageal cancer</i>				
yes	27.1	17.1	97(23)	
No	71.8	79.3	313(75)	0.019
I don't know	1.18	3.66	9(2.15)	
<i>Marital status</i>				
Single	28.2	31.1	123(29)	
Married	60.4	59.8	252(60)	
Separated	5.9	4.9	23(5)	0.92
Divorced	1.18	0.6	4(1)	
Widowed	4.3	3.7	17(4)	
<i>Monthly income (TZS)</i>				
< 50000	58.0	60.4	247(59)	
50-100,000	15.7	21.36	75(18)	0.099
>100000	26.3	18.3	97(23)	

4.2.3. Level of knowledge on hot beverages as risk factor for esophageal cancer

Of all participants interviewed, 48% were knowledgeable about hot beverages as a risk factor for esophageal cancer. The proportion knowledgeable was higher among male (54%) than female (46%) ($p=0.184$). This level of knowledge differed by study ward ($p<0.001$) and education level ($p=0.044$) but did not differ by marital status ($p=0.705$) and monthly income ($p=0.462$). The results are in Table 4. 23% of those who considered hot beverages as a risk factor for esophageal

cancer had a family history of esophageal cancer compared to 76% of those who reported to have no family history of esophageal cancer ($p=0.085$).

Table 4: Knowledge of Hot beverages as a risk factor for esophageal cancer among adults in lower Moshi, Kilimanjaro (N=419)

Variables	Yes %	No %	Total N (%)	p-value
<i>Name of the ward</i>				
Kahe	44.8	35.9	168(40)	
Mabogini	47.8	32.3	166(40)	<0.001
Arusha Chini	7.5	31.8	85(20)	
<i>Sex</i>				
Male	53.8	47.3	211(50)	0.184
Female	46.2	52.7	208(50)	
<i>Education level</i>				
Not attended	3.5	5.9	20(5)	
Primary	55.3	61.8	246(59)	0.044
Secondary	28.6	26.8	116(28)	
Tertiary	12.6	5.5	37(9)	
<i>Family history of esophageal cancer</i>				
yes	23.12	23.18	97(23)	
No	76.38	73.18	313(7)	0.085
I don't know	0.50	3.64	9(2)	
<i>Marital status</i>				
Single	31.2	27.7	123(29)	
Married	59.3	60.9	252(60)	
Separated	4.0	6.8	23(5)	0.92
Divorced	1.0	0.9	4(1)	
Widowed	4.5	3.6	17(4)	
<i>Monthly income(TZS)</i>				
< 50000	59.8	58.2	247(59)	
50000-100000	15.6	20	75(18)	0.099
>100000	24.6	21.8	97(23)	

4.2.4. Level of knowledge on red meat consumption as risk factor for esophageal cancer

Of all participants interviewed, 51% were knowledgeable about red meat consumption as a risk factor for esophageal cancer. The proportion knowledgeable was higher among Kahe residents (52%) compared to residents of Mabogini (43%) and Arusha Chini (5%) ($p<0.001$). This level of knowledge did not differ by sex ($p=0.304$), marital status ($p=0.225$), monthly income ($p=0.714$) and education level ($p=0.194$). The results are in Table 5. 77% of those who considered red meat consumption as a risk factor for esophageal cancer had a family history of esophageal

cancer compared to 23% of those who reported to have no family history of esophageal cancer ($p=0.176$).

Table 5: Knowledge of Red meat consumption as a risk factor for esophageal cancer among adults in lower Moshi, Kilimanjaro (N=419)

Variables	Yes %	No %	Total N (%)	p-value
<i>Name of the ward</i>				
Kahe	52.1	27.7	168(40)	
Mabogini	42.7	36.4	166(40)	<0.001
Arusha Chini	5.2	35.9	85(20)	
<i>Sex</i>				
Male	47.9	52.9	211(50)	0.304
Female	52.1	47.1	208(50)	
<i>Education level</i>				
Never attended	4.2	5.3	20(5)	
Primary	56.8	60.7	246(59)	0.194
Secondary	27.2	28.2	116(28)	
Tertiary	11.7	5.8	37(9)	
<i>Family history of esophageal cancer</i>				
Yes	22.1	24.3	97(23)	
No	77.0	72.3	313(75)	0.176
I don't know	0.9	3.40	9(2)	
<i>Marital status</i>				
Single	32.4	26.2	123(29)	
Married	56.8	63.6	252(60)	
Separated	4.2	6.8	23(5)	0.23
Divorced	1.4	0.5	4(1)	
Widowed	5.2	2.9	17(4)	
<i>Monthly income(TZS)</i>				
< 50000	59.6	58.3	247(59)	
50-100,000	16.4	19.4	75(18)	0.714
>100000	23.9	22.3	97(23)	

4.2.5. Level of knowledge on pesticides exposure as risk factor of esophageal cancer

Of all participants interviewed, 68% were knowledgeable about pesticide exposure as a risk factor for esophageal cancer. The proportion knowledgeable was higher among male (52%) than female (48%) ($p=0.184$). This level of knowledge differed by study ward ($p<0.001$) and education level ($p=0.002$) but it did not differ by marital status ($p=0.612$) and monthly income ($p=0.083$). The results are in Table 6. 25% of those who considered pesticides exposure as a risk factor for esophageal cancer had a family history of esophageal cancer compared to 75% of those who reported to have no family history of esophageal cancer

($p=0.319$).

Table 6: Knowledge of Pesticides exposure as a risk factor for esophageal cancer among adults in lower Moshi, Kilimanjaro (N=419)

Variables	Yes %	No %	Total N (%)	p-value
<i>Name of the ward</i>				
Kahe	44.5	30.9	168(40)	
Mabogini	42.1	34.6	166(40)	<0.001
Arusha Chini	13.4	34.6	85(20)	
<i>Sex</i>				
Male	51.9	47.1	211(50)	0.349
Female	48.1	52.9	208(50)	
<i>Education level</i>				
Not attended	5.0	4.4	20(5)	
Primary	54.4	67.7	246(59)	0.002
Secondary	28.3	26.5	116(28)	
Tertiary	12.4	1.5	37(9)	
<i>Family history of esophageal cancer</i>				
Yes	25.1	19.1	97(23)	
No	73.1	77.9	313(75)	0.319
Don't know	1.8	2.9	9(2)	
<i>Marital status</i>				
Single	26.9	34.6	123(29)	
Married	62.2	55.9	252(60)	
Separated	5.7	5.1	23(5)	0.61
Divorced	1.1	0.7	4(1)	
Widowed	4.2	3.7	17(4)	
<i>Monthly income (TZS)</i>				
< 50000	57.6	61.8	247(59)	
50-100,000	16.3	21.3	75(18)	0.083
>100000	26.1	16.9	97(23)	

4.2.6. Level of knowledge on obesity as risk factor for esophageal cancer

Of all participants interviewed, 41% were knowledgeable about smoking as a risk factor for esophageal cancer. The proportion knowledgeable was higher among male (51%) than female (49%) ($p=0.707$). This level of knowledge differed by study ward ($p<0.001$) but did not differ with education level ($p=0.537$), marital status ($p=0.308$) and monthly income ($p=0.302$). The results are in Table 7. 26% of those who considered obesity as a risk factor for esophageal cancer had a family history of esophageal cancer compared to 74% of those who reported to have no family history of esophageal cancer ($p=0.024$).

4.2.7. Level of knowledge on genetics as risk factor for esophageal cancer

Of all participants interviewed, 51% were knowledgeable about genetics as a risk factor for esophageal cancer. The proportion knowledgeable was higher among Kahe residents (49%) compared to residents of Mabogini (33%) and Arusha Chini (18%) ($p=0.001$). This level of knowledge did not differ by sex ($p=0.661$), marital status (0.149), monthly income ($p=0.592$) and education level ($p=0.059$). The results are in Table 8. 63% of those who considered genetics as a risk factor for esophageal cancer had a family history of esophageal cancer compared to 56% of those who reported to have no family history of esophageal cancer ($p=0.019$).

Table 7: Knowledge of Obesity as a risk factor for esophageal cancer among adults in lower Moshi, Kilimanjaro (N=419)

Variables	Yes %	No %	Total N (%)	p-value
<i>Name of the ward</i>				
Kahe	57.89	27.82	168(40)	
Mabogini	37.43	41.13	166 (40)	<0.001
Arusha Chini	4.68	31.05	85(20)	
<i>Sex</i>				
Male	51.46	49.60	211(50)	0.707
Female	48.54	50.40	208 (50)	
<i>Education level</i>				
Not attended	5.26	4.44	20 (5)	
Primary	56.14	60.48	246 (59)	0.537
Secondary	27.49	27.82	116 (28)	
Tertiary	11.11	7.26	37 (9)	
<i>Family history of esophageal cancer</i>				
Yes	26.32	20.97	97 (23)	
No	73.68	75.40	313 (75)	0.024
Don't know	0.00	3.63	9 (2)	
<i>Marital status</i>				
Single	29.82	29.03	123 (29)	
Married	56.73	62.50	252 (60)	
Separated	5.85	5.24	23 (6)	0.31
Divorced	1.17	0.81	4 (1)	
Widowed	6.43	2.42	17 (4)	
<i>Monthly income (TZS)</i>				
< 50000	62.57	56.45	247 (59)	
50-100,000	14.62	20.16	75 (18)	0.302
>100000	22.81	23.39	97 (23)	

4.3. Bivariate association between smoking and socio-demographic characteristics among adults in lower Moshi, Kilimanjaro

Out of 419 participants who were interviewed in this study, 61 (15%) reported to be current smokers. The prevalence was higher in male (72%) compared to female (28%) participants. The prevalence of smoking is significantly associated with sex ($p<0.001$). The smoking prevalence significantly increased with age where 49% for those who were 46-59 years compared to 44% (18-45 years) and 7% (60 and above years).

The smoking prevalence also significantly increased with marital status where 56% were married compared to 21% (Single), 3% (divorced), 13% (separated) and 7% (widowed) ($p=0.006$). There was significant difference between level of Education and prevalence of

smoking (Never attended school 10% vs primary 67% vs secondary 16% vs Tertiary 37%) (p=0.038)

Table 8: Knowledge of genetics as a risk factor for esophageal cancer among adults in lower Moshi, Kilimanjaro (N=419)

Variables	Yes %	No %	Total N(%)	p-value
Name of the ward				
Kahe	48.58	31.40	168 (40)	
Mabogini	33.02	46.38	166 (40)	0.001
Arusha Chini	18.40	22.22	85 (20)	
Sex				
Male	51.42	49.28	211 (50)	
Female	48.58	50.72	208 (50)	0.661
Education level				
Not attended	2.36	7.25	20 (5)	
Primary	58.02	59.42	246 (59)	0.059
Secondary	28.77	26.57	116 (28)	
Tertiary	10.85	6.76	37 (9)	
Family history of esophageal cancer				
yes	28.77	17.39	97 (23)	
No	68.87	80.68	313 (75)	0.019
I don't know	2.36	1.93	9 (2)	
Marital status				
Single	32.55	26.09	123 (29)	
Married	57.08	63.29	252 (60)	
Separated	3.77	7.25	23 (6)	0.15
Divorced	1.42	0.48	4 (1)	
Widowed	5.19	2.90	17 (4)	
Monthly income (TZS)				
< 50000	59.91	57.97	247 (59)	
50000-100000	16.04	19.81	75 (18)	0.592
>100000	24.06	22.22	97 (23)	

Table 9: Bivariate association between smoking and socio-demographic characteristics among adults in lower Moshi, Kilimanjaro (N=61)

Variable	N	%	p-value
Male	44	72.13	<0.001
Female	17	27.87	
Age			
18-45yrs	27	44.26	<0.001
46-59yrs	30	49.18	
60 and above	4	6.56	
Marital status			
Single	13	21.31	
Married	34	55.74	
Separated	8	13.11	0.006
Divorced	2	3.28	
Widowed	4	6.56	
Education level			
Never attended	6	9.84	
primary	41	67.21	0.038
Secondary	10	16.39	
Tertiary	4	37.04	
Occupation			
Employed	14	22.95	
Peasant	33	54.1	<0.001
Self employed	11	18.03	
Unemployed	3	4.92	
Monthly income (TZS)			
<50000	29	47.54	
50-100,000	17	27.87	0.061
>100000	15	24.59	

Out of the 61 smokers, about half of them (52%) reported to have been smoking for a period of more than 10 years while 2% reported to have smoked for less than one year preceding the study.

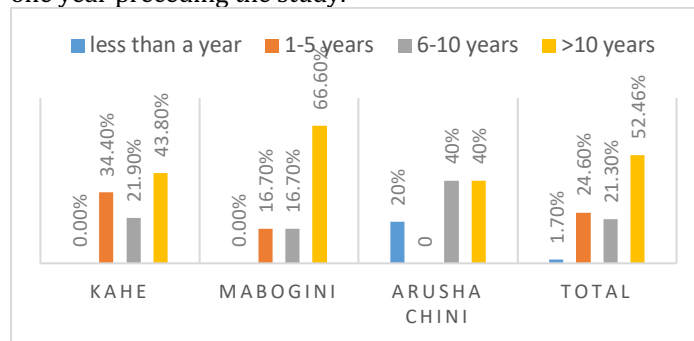


Figure 3: The Period of years of smoking among the study participants

Out of 61 smokers, Most of them smoked 1 to 5 sticks per day (39.3%) and more than 10 sticks per day (41%). While the least of the smokers (19.7%), smoked six to ten sticks of cigarettes per day. . .

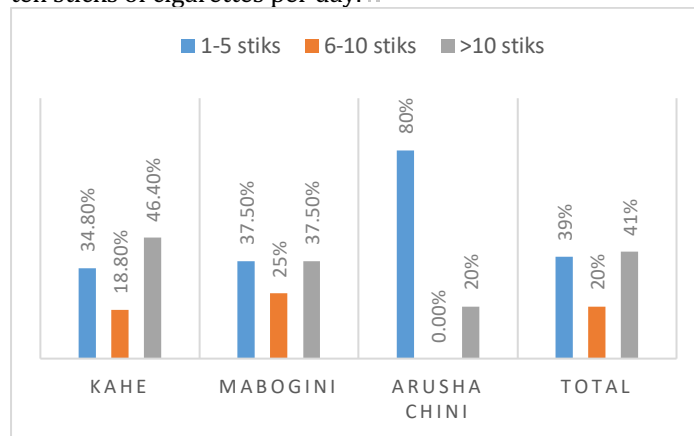


Figure 4: Number of cigarette sticks smoked per day

Logistic regression was conducted to identify socio-demographic determinants of smoking among adults living in lower Moshi Kilimanjaro region. Males respondent were almost three times more likely to be smokers as compared to female respondents (OR=2.696; 95%CI: 1.372, 5.299; p=0.004). Moreover, people who were self- employed were about five times more likely to be smokers as compared to those who were unemployed. (OR= 4.847; 95%CI: 1.019, 23.05; p=0.047)

4.4. Extent of Alcohol consumption among adults in lower Moshi, Kilimanjaro region

4.4.1. Bivariate association between alcohol drinking and socio-demographic characteristics among adults in lower Moshi, Kilimanjaro

The overall prevalence of reported alcohol consumption was 23%. Reported prevalence of alcohol consumption was 68% among male and 32% among female (p<0.001) .Out of 97 Alcohol drinkers, majority (60%) reported to have been drinking for a period of more than 10 years while 5% reported to have drinking for less than one year preceding the study. Majority (71%) of the Alcohol drinkers took 1 to 5 bottles per day compared to the while a relatively small proportion (9%) took 6 to 10 bottles per day. The alcohol drinking prevalence significantly increased with age where 53% for those who were 18-45 years compared to 30% (46-

59 years) and 16% (60 and above years).

Table 10: Socio-demographic determinants of smoking among adults living in lower Moshi, Kilimanjaro region

Logistic regression	Odds Ratio	95% CI		p-value
		Lower	Upper	
<i>Ward</i>				
Kahe	3.02	0.92	9.91	0.068
Mabogini	2.53	0.82	7.81	0.106
Arusha Chini	1			
<i>Sex</i>				
Male	2.70	1.37	5.30	0.004
Female	1			
<i>Education level</i>				
Never attended	1.00	0.17	5.78	0.999
Primary	0.81	0.22	3.00	0.752
Secondary	0.46	0.11	1.86	0.275
Tertiary	1			
<i>Monthly income (TZS)</i>				
< 50000	1.46	0.62	3.441	0.387
50000-100000	2.28	0.906	5.738	0.08
> 100000	1			
<i>Age</i>				
18-45yrs	0.45	0.092	2.20	0.323
46-59yrs	2.84	0.59	13.59	0.192
60 and above	0.18	0.014	2.21	0.179
<i>Occupation</i>				
Employed	6.01	1.46	24.84	0.13
Peasant	4.75	1.23	18.40	0.24
Self employed	4.85	1.02	23.05	0.047
Unemployed	1			
<i>Marital Status</i>				
Single	2.60	0.74	9.17	0.136
Married	1.97	0.61	6.40	0.258
Separated	0.58	0.14	2.37	0.445
Divorced	0.31	0.032	2.94	0.306
Widowed	1			

There was significant difference between level of education and prevalence of alcohol drinking (Never attended school 8% vs primary 69% vs secondary 18% vs Tertiary 5%) (p=0.007). There was significant difference between occupation and prevalence of alcohol drinking (p=0.001). There was no significant difference between marital status and prevalence of alcohol drinking (Divorced 2% vs Single 22% vs married 65% vs

separated 7% vs widowed 4%) (p=0.254)

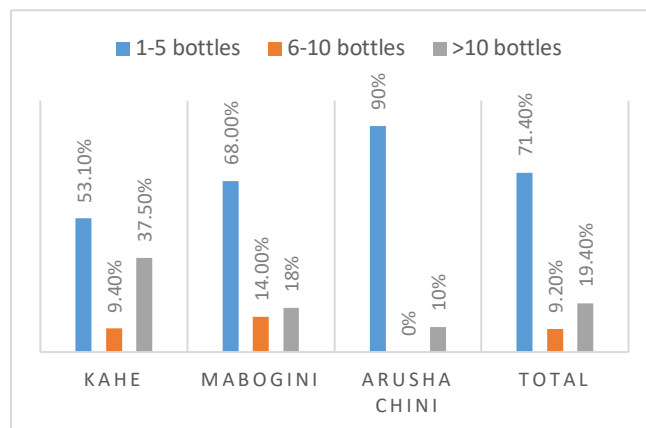


Figure 5: Number of bottles of Alcohol drunk per day

Table 11: Bivariate association between alcohol drinking and socio-demographic characteristics among adults in lower Moshi, Kilimanjaro (N=97)

Variable	N	%	p-value
<i>Sex</i>			
Male	66	68	
Female	31	32	<0.001
<i>Age</i>			
18-45 yrs	51	53	
46-59 yrs	29	30	<0.001
60 and above	16	17	
<i>Marital status</i>			
Single	21	22	
Married	63	65	
Separated	7	7	0.254
Divorced	2	2	
Widowed	4	4	
<i>Education level</i>			
Never attended	8	8	
Primary	67	69	
Secondary	17	18	0.007
Tertiary	5	5	
<i>Occupation</i>			
Employed	22	23	
Peasant	49	51	
Self employed	13	13	0.001
Unemployed	13	13	
<i>Monthly income (TZS)</i>			
<50000	43	47	
50000-100000	16	17	<0.001
>100000	38	39	

Table 12: Socio-demographic determinants of alcohol consumption among adults living in lower Moshi, Kilimanjaro region

Variable	Logistic regression	95% CI		p-value
	Odds Ratio	Lower	Upper	
Ward				
Kahe	1.486	0.584	3.784	0.406
Mabogini	4.116	1.832	9.247	0.001
Arusha Chini	1			
Sex				
Male	1.918	1.097	3.351	0.022
Female	1			
Education level				
Not attended	3.242	0.672	15.65	0.143
Primary	2.431	0.809	7.3	0.113
Secondary	0.978	0.302	3.171	0.971
Tertiary	1			
Monthly income				
< 50000	0.457	0.232	0.898	0.023
50-100,000	0.483	0.219	1.065	0.071
> 100000	1			
Age				
18-45yrs	0.156	0.036	0.671	0.013
46-59yrs	0.399	0.091	1.747	0.223
60 and above	1			
Occupation				
Employed	1.645	0.653	4.144	0.291
Peasant	1.488	0.651	3.401	0.346
Self employed	1.747	0.575	5.304	0.325
Unemployed	1			
Marital Status				
Single	1			
Married	1.495	0.443	5.037	0.517
Separated	0.923	0.29	2.934	0.892
Divorced	0.703	0.168	2.939	0.629
Widowed	0.308	0.032	2.942	0.306

4.4.2. Independent determinants of alcohol consumption

Logistic regression was conducted to identify socio-demographic determinants of smoking among adults living in rural Moshi Kilimanjaro region. Males respondent were almost two times more likely to be drinkers as compared to female respondents (OR=1.918; 95%CI: 1.097, 3.351; p=0.022). The results are in Table 12.

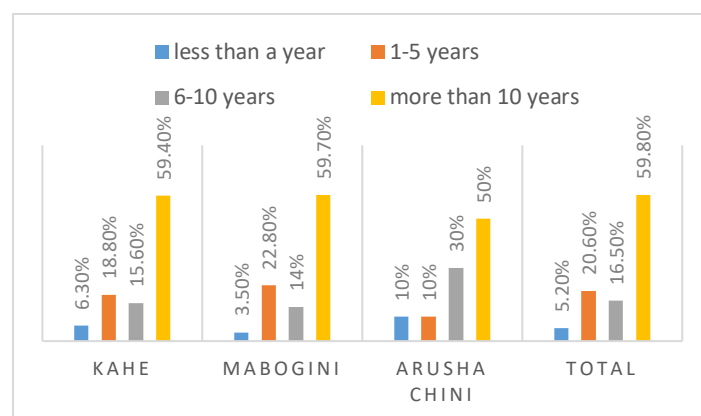


Figure 6: The Period of years of alcohol drinking among the study participants

4.5. Level of awareness on cancer health related services

When participants were assessed about their awareness with regards to cancer treatment, 51% indicated to be aware of various cancer treatment modalities which included Surgery, chemotherapy and radiotherapy. Female were just as aware of cancer treatment modalities as male (both 51%, p=0.036). Participants from Arusha Chini ward (62%) were more aware of cancer treatment modalities than those from the other study wards (p<0.001). Additionally, awareness was found to significantly increase with increase in education level (p<0.001) and differed by monthly income (0.013), occupation (<0.001) and familial history of the disease (0.027). The results are in Table 13.

Out of 419 participants, 89% considered hospital as a place to seek for treatment of esophageal cancer. The proportion was the same in female and males. A significantly larger proportion of participants from Kahe (92%) and Mabogini ward (94%) mentioned hospital as a place for cancer care as compared to those from Arusha Chini ward (75%), (p=0.001). The proportion of participants reporting hospital as a place for cancer care did not differ by education level, age or family history of esophageal cancer.

5. Discussion

5.1 Knowledge on EC risk factors

More than 71% among adult aged 18 years and above were aware that smoking and drinking alcohol are risk factors for esophageal cancer at the Rural District in Kilimanjaro Region. These proportions of participants who were knowledgeable about smoking (84%) and alcohol (61%) as risk factors for esophageal cancer were higher than the study done in Bomet in Kenya (Smoking 71% and alcohol 52%, Duron 2013). This observed difference could be attributed by difference in location (Kahe 42% vs Mabogini 39% vs Arusha Chini 19%). Sex (male 53% and female 47%) showed that males in all the three areas where this study was conducted were more knowledgeable on the risk factors of esophageal cancer.

Table 13: Awareness of cancer treatment modalities among adults in lower Moshi, Kilimanjaro region

Variables	Yes (%)	No (%)	Total	p-value
<i>Ward</i>				
Kahe	76 (45)	92(55)	168	
Mabogini	85(51)	81(49)	166	<0.001
Arusha Chini	53(62)	32(38)	85	
<i>Sex</i>				
Male	107(51)	104(49)	211	0.036
Female	107(51)	101(50)	208	
<i>Education level</i>				
Not attended	6(30)	14(70)	20	
Primary	103(42)	143(58)	246	
Secondary	76(66)	40(34)	116	<0.001
Tertiary	29(78)	8(22)	37	
<i>Family history</i>				
Yes	47(48)	50(52)	97	
No	163(52)	150(48)	313	0.027
Don't know	4(44)	5(56)	9	
<i>Age</i>				
18-45yrs	155(49)	161(51)	316	
46-59yrs	44(60)	29(40)	73	0.763
60 plus	15(50)	15(50)	30	
<i>Monthly income (TZS)</i>				
< 50000	113(46)	134(54)	247	
50-100,000	40(53)	35(47)	75	0.013
>100000	61(63)	36(37)	97	
<i>Occupation</i>				
Unemployed	80(66)	41(34)	121	
Peasant	66(40)	97(60)	163	<0.001
Self employed	17(32)	36(68)	53	
Employed	41(57)	31(43)	72	

Also a history of having esophageal cancer among a family member showed that 25% of those who considered smoking as a risk factor for esophageal cancer had a family history of esophageal cancer compared to 75% of those who reported to have no family history of esophageal. Furthermore, this study was able to show low levels of knowledge of additional risk factors which the study done in Bomet did not address. These risk factors were obesity, pesticide exposures, consumptions of hot beverages and red meat. These low proportions were due to low education level.

5.2 Practices associated with risk factors of EC

The prevalence of smoking in this study was 15% which was higher compared to 11% in the Bomet study,

due to low education level. But also alcohol intake prevalence was higher in our study compared to that found in Kenya (15%) (Duron 2013). This difference could be due to the Chagga tribal culture that supports drinking alcohol. Furthermore, there were some women who were smokers (28%) and alcohol drinkers (32%) despite the African cultural norms against smoking and alcohol drinking among females. This could be due to modern life styles adapted in the society. This study also went into more details to show the amount and periodicity of smoking and alcohol intake. Most of them were males aged 60 and above who smoked cigarettes or drank alcohol for more than ten years with an average 1-5 bottles of alcohol and sticks of cigarettes. This was associated with low levels of literacy, and the ability to purchase alcohol and cigarettes since employment was the source of income. The study focused on smoking and alcohol intake because they were the most behavioral practices scene in most studies (Pelucchi, 2011) (WHO, 2014) (Jon, 2013). A study in China was done and about 15% of esophageal cancer deaths in men and 1.3% in women were caused by alcohol drinking.

Table 14: Participants awareness on where to seek

	home	church	hospital	traditional healer	total N	p-value
<i>Name of the ward</i>						
Kahe	0	1	91	8	168	
Mabogini	1	1	93	5	166	.001
Arusha Chini	2	1	75	21	85	
<i>Sex</i>						
Male	0.5	1	89	10	211	.878
Female	1	0.5	89	9	208	
<i>Education level</i>						
None	0	0	85	15%	20	
Primary	1	1	89	9	246	.814
Secondary	0	0	91	9	116	
Tertiary	0	0	89	11	37	
<i>Family history</i>						
Yes	0	1	92	7	97	
No	1	0.6	88	10	313	.926
Don'tknow	0	0	89	11	9	
<i>Age group</i>						
18-45yrs	0.6	1	88	10	316	
46-59yrs	1	0	92	7	73	.87
60 +	3	0	97	0	29	

5.3 Determinants for risk factors associated with EC

The study was able to identify the determinants of practice of smoking and alcohol drinking as esophageal cancer risk factors which the study done in Kenya did not show (Duron 2013). Male respondents were three times more likely to be smokers and drinkers as

compared to female respondents. Moreover, people who were self-employed were five times more likely to be smokers as compared to those who were unemployed. This could be attributed to the social norms and responsibilities of male adults of making a monthly income and provide to the family. Thus most of the male adults were working class compared to female who mostly were housewives or unemployed.

Also this study showed a higher prevalence of family history of the disease (23%) compared to 9% in Bomet. This could be due to the higher practices of risk factors.

5.4 Awareness of cancer related health services

The level of awareness of modalities of treatment was low as that of Bomet, Kenya (49%) and almost similar level of awareness on a place to attain cancer related health services (hospital) to that in Bomet (88%,) (Duron 2013). Thus awareness on types of treatments of esophageal cancer is still low in the rural Kilimanjaro may be due to low level of education.

Furthermore, this study also showed lower levels of awareness on prevention 47% and early diagnosis (screening) 70% compared to the study done in Bomet (prevention 62% and screening 86%). This due to low levels of literacy and traditional beliefs like witchcraft and evil spirits. This study also showed a lower proportion of adults who considered difficulty in swallowing as a main symptom of the disease compared to 79% in Bomet (Duron et al 2013). This may lead to delayed health seeking behaviors.

The study also showed that media (radios) was the main source of information, of which the study in Bomet didn't address. This could be due to high level of illiteracy.

5.5. Discrimination and stigma

This study also showed a lower portion of adults (9%) who thought the disease to be contagious compared to Bomet (35%). Such a belief may contribute to ethical issues of discrimination and stigma towards the people with the disease thinking that it will spread. This difference could be due to higher prevalence of family history of the disease, where most of the people got information through having a family member with the disease

5.6. Autonomy

With a diagnosis of EC, as many concerns are concerned, ethical issues are of concern because most patients feel that their right to autonomy is not attained. This is due to very limited options of treatment especially upon a late stage diagnosis, and limited pain control for end of life care due to the phobia of using opioid analgesics, especially in a setting like ours. Moreover, due to the deficiency of information on cancer treatments, pathophysiology and distribution, most patients and relatives feel as though there is too much probing and treatment undertaken is focused on answering said questions than on patient management and concerns.

5.7. Economic Issues

In a resource limited population such as ours, distribution of resources especially to the older

population is of concern. While medical care for patients older than 60 years is free as per the national health policy, most of the investigations and treatment modalities for cancer related services are expensive and need to be paid out of pocket. This causes neglect to cancer patients (most of whom are in said age group) or a sense of guilt and inconvenience that the patient feels towards the family. Ethical factors are ignored especially in private health providing centers due to economic restraints.

5.8. Truth telling

Truth telling and honesty in cancer condition is another ethical dilemma with respect to preserving a patient's hope and religious beliefs, when the patient is not willing to accept the prognosis. The invasive nature of respective procedures are related to a high morbidity and mortality and this makes decision making difficult. In addition to this, the chemotherapy and radiotherapy procedures are not common modalities and thus special considerations should be taken in such cases.

5.9. Study Limitations

There are several potential limitations in this research. Social desirability bias could mean people do not report correctly sensitive information such as those related to smoking and alcohol. This was reduced by ensuring privacy, confidentiality and establishing rapport with each individual during the interview in a private space. The results of the research may not be generalized for the whole country. The literacy level was low.

5.10. Public health implications

The main step towards tackling prevalence of esophageal cancer is through knowledge, awareness and practice of esophageal cancer risk factors and related health services. Hence there is need to improve low level of knowledge and high level of practice of esophageal cancer risk factors and low level of awareness of cancer related health services among adults.

6. Conclusions

The study findings conducted in three wards confirms that, despite a good level of knowledge about risk factors for esophageal cancer, their practice of such risk factors is high. Awareness of where to seek for cancer related health services was high with hospitals been mentioned by majority though there was low understanding on modalities of treatment among adults in Rural Kilimanjaro. There is still a high challenge on ethical matters such as end of life and palliative care, autonomy and truth telling and economic restraints facing cancer management and patients affected with the illness.

7. Recommendations

1. Behavioural intervention aiming at addressing risk factors for esophageal cancer should be given priority. The intervention should target important risk behavioural risk factors such as smoking and alcohol consumption.
2. Promotion of healthy life style is vital in prevention of esophageal cancer through common ways such as media, health facilities and education institutions.

3. Ethical matters such as truth telling, ageism, end of life care and autonomy need to be addressed to improve the perception of cancer related health issues and health seeking behaviour among the members of the community.

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Jahr's Bioethical Imperative & Euthanasia

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Introduction

A famous journalist in Taiwan has recently flown to Switzerland to register in a physician-assisted suicide program (known as euthanasia by some [1]) and died there. Prior to his trip, he had feverishly appealed to Taiwan's authority to legalize euthanasia without any result thus decided to set himself as an example to prove that each person can possess the right to end his own life when suffering from incurable diseases.

This incident provoked much debate in Taiwan. A major newspaper named *Apple Daily* reported the whole incident for weeks. When the incident ended, the news paper carried a whole page discussion inviting different scholars and experts to express their point of views from both pro and con perspectives [2]. The debate on the issue is still going on even today.

Autonomy and Euthanasia

"Patients' autonomy" has been regarded as one of the most important principles of modern medical ethics. No medical procedures can be performed without the consent of the patients or their surrogates whereby the patient is incapacitated. In research, either biomedical or social behavioral, the "Informed Consent" of the human subjects is also absolutely necessary unless the Institute Ethic Review Board known as IRB approves to waive it. From this emphasis of the importance of autonomy, the younger generation has come up with a

new slogan, "if it feels good, do it". In Taiwan, this new slogan is known as "as long as I like it, nothing is unallowable." With the rise of this new living attitude, the boundary of the good and the bad, or the right and the wrong has been blurred because the judgment depends on one's own choice. Applying this new understanding to the issue of euthanasia, autonomous decision-making seems to be justifiable and should be permitted because it is an individual's will and desire that must be respected.

Fritz Jahr and Bioethical Imperative

Fritz Jahr was the first scholar who spoke of bioethics in 1926. He can be known as the father of modern bioethics. His profound writings have been discovered by a former Georgetown scholar, Dr. Han Martin Sass who in his research found that Dr. Jahr had discussed the issue of bioethics even before WWII and proposed an important view for all to reflect upon that is known as "Bioethical Imperative" -- "respect every living being on principle as an end in itself and treat it, if possible, as such." [3]

In Jahr's writings, he repeatedly stated the preciousness and sanctity of life, not only human life but all forms of life. His view is similar to a religion such as Hinduism that perceives life as one and for that sake all life must be cherished. Jahr however, assumed that life has different functions according to its kind from creation and humankind has been given with the duty to manage the earth to carefully look after and equally treat all creatures including animals and plants. He urged that life must be preserved due to the nature of life as morally sacred including one's own life [4]. He quoted Schopenhauer, "*Neminem laede, imo omnes, quantum potes juval*" (translated in English as "*don't hurt anyone but help everyone as far as you possibly can*"). Jahr also illustrated on Moses' Ten Commandments of "*you shall not kill*" [5] and provided a broader insight that besides avoiding doing harm, we must also treat all creatures respectfully and equally from the perspectives of sanctity of life and life's manifestations, therefore the command of "*you shall not kill*" is deepened as a bioethical imperative to "*respect every living being on principle as an end in itself and treat it, if possible, as such.*" [3]

The Duty to preserve life

Jahr discussed further that each person must observe the duty to preserve one's own life. According to him, there are three stages of life, to begin with, life existing in the earthly house of the mother's body in flesh. It is a preparation for the second and also the third. Once we are born we live in this life-body which is mortal. The third stage is like everyday dress is changed into a holiday dress, the hut becomes a palace, the natural body that is spiritual and transfigured.

He called the passage from the first stage to the second as death as the baby at birth cries at leaving the mother's protective womb. In his words, "for leaving your quarters even if it is only a hut, is an inconvenience as anyone knows who has to move". He called the passage from the second to the third is resurrection. His argument was theological and philosophical but he indicated that the three stages of life are what we have.

Since we are given the life-body, he appealed that we must preserve it attentively until the time we are called to enter into the third stage. [6] Taking care of one's own physical body of the second stage of life is not to abuse it "by not taking one's life, not shortening it, not harming or endangering it, not weakening one's health [7]. From Jahr's point of view, life is to be valued therefore any action of taking it away by human effort is immoral.

If we trace back to the original tradition of medical ethics, the Father of Medicine, Hippocrates has strongly suggested in his oath -- "I will use treatment to help the sick according to my ability and judgment but never with a view to injury and wrongdoing. Neither will I administer a poison to anybody when asked to do so, nor will I suggest such a course. Similarly, I will not give to a woman a peccary to cause abortion. But I will keep pure and holy both my life and my art" [8] (Hippocratic Oath). Who holds the key to the formation of life?

With the rise of consumerism that emphasizes individual's rights to choose, to safety, to be informed and to be heard [9], the world has changed. The emphasis of modern medical ethics on autonomy is nothing wrong but it propelled many different interpretations. Saying each person owns the right to decide his life or death is implausible subjected to debate. J Savulescu has an interesting discussion on "Is there a right of not to be born? Reproductive decision making and the right of information" in Journal of Medical Ethics [10] in which he discussed a case in India that wrongly gave birth to a baby whose gender is not desired and the parents thus sued the physician for wrongly predicted baby's gender. The right to life and death has nothing to do with autonomy because we cannot choose to be born or not. The naturally endowed right only begins when the life is formed that some interpret as at the time of conception while others view it as the moment of spontaneously breathing at birth. From this view we find although we do have autonomous rights in life, the right to have a life is always in nature's hand.

To use a simple illustration, have we ever been asked before our birth by our parents that they are going to bring us to life? No, absolutely not. Autonomous choice is not applied here. Although family planning is available now, our parents even cannot predict the baby who will come to them is you or me. In other words, we practice no informed consent to our life when we are born. Likewise, the time of death is also in the hand of nature or God. The Taoists have this famous teaching: "*human follows heaven, heaven follows Tao and Tao follows nature.*" Fung Yu-lan, the most important Chinese philosopher of the 20th century has said: according to Lao-tze and Chuang-tze, life followed by death is the course of nature and man should follow this natural course calmly [11]

Those who insist autonomy as inviolable right such as John Harris who said "the point of autonomy, the point of choosing and having freedom to choose between comparing conception of how and indeed why, to live, is simply that it is only thus that our lives become in any real sense our own. The value of our value is the value that we give to our lives [12], this right, however is only relative. There are also many bioethical scholars who argued from different perspective to uphold the value of

life itself such as Robert Orr, John Wyatt, Andrew Fergusson, and so on [13].

Euthanasia is a controversial issue in medical ethics today. The umbrella of medical ethics is the sacredness of life. Without this premise, the discussion of ethics is meaningless. The main argument of favoring euthanasia, in addition to the principle of autonomy is the question that isn't ending the suffering of a patient who endures from unbearable pain, a good act? Thus euthanasia should be justified.

In fact, euthanasia implies four different forms depending on individual's emphasis, namely positive and negative, active and passive. The main controversy going on in bioethical discussion focuses on active euthanasia, that is to apply an artificial means either taking medicine or injection or else to terminate a life prior to its natural death. Since the procedures are quick and painless, it is called a good death or mercy killing to end all sufferings. Indeed, this argument can somehow be seen as a beneficial act but the procedures are not completely free from psychological struggle and physical distress. The question is not how we apply a method to ensure a painless ending, rather, do we possess a right to end a life?

The right to life and death has nothing to do with autonomy, we cannot even choose our own life as we discussed earlier therefore although we do have autonomous rights in life, the right of life and death is still in nature's hand.

Instincts to life and death

Freud in his book *Beyond the pleasure principles* in 1920, concluded all instincts fall into two categories, namely, instinct to live and instinct to die. The life instincts are those which deal with basic survival, pleasure, and reproduction. The concept of the death instincts was initially described in the book in which Freud proposed that "the goal of all life is death." [14]

Indeed, that is, the life instinct motivates people's desire to live and enjoy life to try their best to live, work hard, endure sickness and seek medical treatment when sick. When people's physical and mental pain exceeds the load, they sometimes seek liberation to end their sufferings. This is death instinct. But life is always stronger than death. Sun Su-miao, the father of Chinese medical ethics, has a clear statement: "*The human life is so important and valuable that is worth more than a thousand pounds of gold...*" [15] and *Chinese Book of Filial Piety* also stated that "*our bodies- to every hair and bit of skin - are received by us from our parents, and we must not presume to injure or wound them. This is the beginning of filial piety*". [16]

Is it not a good thing to give euthanasia to patients suffering from terminal cancer or patients whose physical pain can no longer be managed? To accommodate this need, many countries have regulated new legislation such as a "Patients' self-determination Act" to allow those patients to decide either to continue treatment or to withhold and withdraw from medical procedures and be admitted to palliative care unit to ease their physical pain and die a dignified death.

Such an act will also be implemented and taken effect in Taiwan in January 2019. This bill that gives patients right to decide whether to continue or suspend medical

treatment, is a manifestation of patient autonomy and respect for individual wishes. Some people refer this palliative care as passive euthanasia because no more active medical treatments will be given except pain control so that patients can live their last phase of life with dignity. The difference between it and active euthanasia is that it respects nature and does not require artificial methods to end life early.

In this care, controlling pain medically is given to ease the discomfort so that the patients do not need to endure excessive pain to maintain the quality of life. This hospice care includes four dimensions that are to care the whole person with whole medical team, whole journey and the whole family is also involved.

Does the patient who has reached the terminal stage of life lose the meaning of life? No, absolutely not. Regardless the physical condition or the senile age, a person does not need to seek an early ending of life. Imagining a young mother who is infected with an incurable disease, by the life instinct, she wants to live on for the sake of her young baby because she as mother is needed.

Jahr called this instinct as altruistic, the sense for compassion, justice, pity and love [17]. If a mother prefers to die and leave her baby alone, it becomes egoistic, only interest in herself. Surely, human beings have no say in either a person can continue to live or not, but a person out of compassion will not give up easily to seek medical help in order to live for others. In Paul's words, to die is to gain as the end of earthly suffering but to live is for Christ and to serve others. When a person is needed, there is a responsibility to live on. When an elderly person is seriously ill, but his survival will make another person feel comforted and strengthened, his continuous existence becomes meaningful.

Make Today Count

Orville Kelly had suffered an incurable disease when he was 42 years old. He was disheartened and frustrated, but later he thought time would elapse the same way either he worried about his illness or if he cheered up. So he started the "Make Today Count" movement for instance, as long as I did something meaningful in a day either reading a book that inspired me or hearing a word that encouraged me or if I prayed for another person. . . . I lived a worthwhile life. Thus every individual should strive to make every day meaningful, to live bravely even with some physical pain because enduring a pain itself has its own value as learning from pain is a living growth too.

In 1993, a farmer in Canada could not bear to see the suffering of his 12 years old congenitally defected daughter when seizure stroke. He decided to end her life by putting her in his car with exhausted carbon dioxides. This incident provoked great controversy in the United States and Canada. A child with the same disease heard the story and wrote a letter to his father that he indeed suffered a great deal when the seizure stroke but every time he survived and requested his father would never use the same measure to end his suffering. He said: life has many hardships but to be alive is precious. Each day is a new day, a new possibility and a new hope.[18]

Concluding words

Do people have the right to artificially terminate their lives? Life always bears meaning either in sickness or in health. In Jahr's own words: "....every human life as such is morally 'sacred' – including one's own life. Preservation of life—and one's own life not excluded—is a duty. And destruction and harm – again including one's own life – is a moral sin." [19].

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HIV/AIDS Health Promotion: Coverage of disabled people within academic literature and Canadian newspapers

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Abstract

HIV/AIDS has been a public health issue and continues to be epidemic. Eradicating HIV/AIDS is part of goal 3.3 of the 2030 sustainability goals. HIV/AIDS is one focus of

health promotion. Disabled people are one vulnerable group at equal or increased risk than other groups for HIV/AIDS. The purpose of our study was to analyze to what extent and how the academic literature and Canadian newspapers engage with disabled people in relation to HIV/AIDS health promotion. We performed a scoping review of academic articles and newspaper articles covering databases to generate descriptive quantitative and qualitative data on how and to what extent the academic literature and newspapers engage with disabled people in relation to HIV/AIDS health promotion. We identified n=621 newspaper and n=7896 academic articles that include the terms "HIV" and "health promotion". Searching these articles using the search terms "disabled people", "people with disabilities", "deaf", "physical disability", "impairment", "intellectual disability", "disabled" and "handicap" only one newspaper article and eleven academic articles were found that had relevant content. Our findings suggest that public education through newspapers and evidence published in academic journals is lacking on the topic of HIV/AIDS health promotion in relation to the social group of disabled people, which hinders a positive change in the HIV/AIDS situation for disabled people and achieving target 3.3 of the sustainable development goals.

Keywords: disabled people; people with disabilities; HIV/AIDS; HIV; AIDS; health promotion; health; sustainable development goals

1. Introduction

Since the early 1980s, HIV/AIDS has been a public health issue and continues to be epidemic [1] with ongoing efforts to prevent, treat and eradicate HIV/AIDS. The UN Sustainable Development Goals have targeted to end the AIDS epidemic by 2030 under Target 3.3 [2]. According to Groce, "one hallmark of HIV/AIDS epidemic has been its impact on vulnerable populations"[3]. Groce and others have noted that disabled people, one vulnerable group, are often overlooked in HIV/AIDS discourses and actions [3,4] although they are at equal or increased risk for HIV [3-7]. Disabled people are often erroneously perceived as a low risk group as they are often assumed to be "sexually inactive, unlikely to use drugs or alcohol, and at less risk of violence or rape than their non-disabled peers" [3] (see also [4,8-10]). Data on the prevalence of HIV/AIDS within the disability community are rare [4,11] or non-existent [12,13]. Disabled people have problems accessing HIV related information [14-18] and the level of knowledge of HIV/AIDS is low among disabled people [17,19].

HIV/AIDS is one focus of health promotion [20,21]. Two key elements of health promotion are good governance for health and health literacy [22]. The idea of health promotion is to move beyond the individual and recognize the impact that wider social and environmental factors have on an individual's well-being. It seeks to promote programs and other interventions that enable people to take greater control over, and improve, their own health and well-being [22]. According to the Ottawa Charter of Health Promotion, Health Promotion Action includes the generation of healthy public policy, creation of supportive

environment, strengthening of community actions and development of personal skills [23].

Mass media, including newspapers are a major source of health information for the public [24]. Newspapers have the ability to shape beliefs and public perceptions and are vital in directing the discussion around social issues [25].

Given the situation of disabled people in relation to HIV/AIDS and given the mandate of health promotion and the impact of newspapers, our study aimed to answer the question: how often and in which way are disabled people covered in academic and newspaper articles that cover HIV/AIDS and health promotion?

2. Materials and Methods

2.1. Study Design

The objective of our study was to ascertain whether and to what extent disabled people were engaged with in academic literature and Canadian newspaper articles that covered HIV/AIDS and "health promotion". To achieve the objective we searched first for the presence of the terms "disabled people" and "people with disabilities" the two major terms used in discourses targeting the social group of disabled people [26-28]. We then used a few other terms related to disabled people namely deaf, "physical disability", "impairment", "intellectual disability", "disabled" and "handicap". Grant et al outlined the characteristics of 14 review types [29]. A modified scoping review drawing from [30] was chosen as most the appropriate method for the study given our research question. Scoping studies allow for identifying the extent of research present on a given topic [29] and the current understanding of a given topic [31]. Our study followed in a modified way the stages outlined by [30] namely: identifying the review's research question, identifying databases to search; recording the descriptive quantitative results, selecting literature based on descriptive quantitative results for qualitative analysis, qualitative analysis of data, and summarizing and reporting findings.

2.2 Data Source

Approach 1: Three academic databases were accessed (EBSCO - an umbrella database that consists of over 70 other databases; Scopus and PubMed). The databases contain journals that cover a wide range of topics and areas of relevance to our study. We limited our searches to all articles (PubMed), article, conference paper, editorial, book chapter, editorial (Scopus), and scholarly peer reviewed journals (EBSCO) for any year.

Approach 2: We accessed the ProQuest Canadian Newsstream database which houses a collection of nearly 300 Canadian English language newspapers covering the years 1980-2017.

2.3 Data Collection (quantitative data)

Eligible papers were identified using explicit search strategies across a range of data sources [32].

Approach 1: First we searched the three academic databases on May 1, 2017 (not reported) and again August 1, 2017 (reported) with the keyword combination of "HIV" AND "health promotion" (data reported), "HIV/AIDS" AND "health promotion" (data not shown) and "AIDS" AND "health promotion" (data not

shown). We limited our searches to title/abstract (PubMed), title, abstract, keyword (Scopus) and abstract (EBSCO ALL). The obtained articles were then searched for the presence of the terms "disabled people" OR "people with disabilities" in the title/abstract (PubMed), title, abstract, keyword (Scopus) and abstract (EBSCO ALL) or in the full text (all three databases). The obtained articles were furthermore searched in the abstract (Scopus, EBSCO ALL) or title/abstract (PubMed) for the presence of the terms "deaf" OR "physical disability" OR "impairment" OR "intellectual disability" OR "disabled" OR "handicap".

We only report the results for "HIV" AND "Health promotion" in relation to terms related to disabled people because when we conducted our search using the term "HIV/AIDS" fewer articles appeared, but the articles that did come up were no different than the articles found using only the term "HIV". When we conducted our search using the term "AIDS", the results contained false positives and the articles that satisfied our inclusion criteria matched the articles that resulted from our search using the term "HIV".

Approach 2: We accessed the ProQuest Canadian Newsstream database on May 1, 2017 (not reported) and August 1, 2017 (reported). The search was limited to newspaper articles from 1980-2017 with the same key words used in Approach 1 appearing in the full text of the articles.

2.4 Data Collection for Qualitative data:

Duplicates of academic articles due to articles being listed in more than one academic database or listed under abstract and full text were eliminated. The remaining n=17 academic articles and n=6 newspaper articles were downloaded in PDF format to the computer and the articles were uploaded into Atlas.ti8©, a qualitative data analysis software, in order to conduct a thematic content analysis of how disabled people were mentioned in relation to HIV and health promotion. The August search generated one more academic article for download in addition to the articles obtained in the May search. No additional newspaper articles resulted in the August search.

2.5 Data Analysis

We employed a descriptive quantitative and a qualitative thematic content approach to answer the research question of this study. The hit counts of the terms and phrases searched for in the three academic databases and the Canadian newspaper database generated our descriptive quantitative data for analysis.

Qualitative data was generated from the n=17 academic and n=6 newspaper articles downloaded as aforementioned. The coding was deductive in the sense that the top level themes we were looking for were predefined by the research question [33,34]. However, the sub-themes that emerged were not pre-set and as such could be seen as an inductive approach [33,34].

Credibility/dependability and confirmability are three trustworthiness measures [35-37]. Both authors performed the quantitative and qualitative analysis. To enhance credibility/ dependability the authors engaged in peer debriefing on the generation of the quantitative and qualitative data. Differences in hit counts did not

occur. Differences in codes and theme suggestions of the qualitative data were few and discussed between authors and revised as needed. Confirmability is evident in the audit trail logged using Memo and coding functions within ATLAS.ti-8®. As to transferability [35-37], our methods provide all the information needed for others to decide whether they want to apply our keyword searches on other data sources such as grey literature or other English language newspapers or newspapers and academic literature of other languages. Given that we focused on some specific terms used in relation to disabled people others could decide to see whether using other terms covering disabled people might lead to different results. We also used the explicit phrase "health promotion" as this is a specific area and field of engagement with certain narratives. Others could use terms such as "HIV prevention" to look at the coverage of disabled people within HIV/AIDS narratives.

2.6 Limitations

The database searches were limited to English language academic articles and English language Canadian newspapers present in the Canadian Newsstream database. Furthermore we only used a few terms covering "disabled people" whereby others exist to describe for example subgroups of disabled people. However we submit that our findings based on the terms used indicates that there is a problem.

3. Results

3.1. Quantitative Results

The terms "HIV" AND "health promotion" were present in n=621 newspaper articles and n=7896 academic articles. Within the n=621 newspaper articles n=6 articles mentioned "People with Disabilities" and n=1 article mentioned "disabled people". Within the n=7896 academic articles n=22 articles mentioned "people with disabilities" in the full text and n=10 in the abstract. The term "disabled people" was mentioned n=10 times in the full text and n=3 times in the abstract.

Within the 621 newspaper articles the term "disabled" was mentioned in eleven articles "deaf" in 5 articles, "physical disability" in three articles "impairment" in two articles, "intellectual disability" in one article and "handicap" in none.

Within the 7896 academic articles the term "disabled" was mentioned in the abstract in n=17 articles, "impairment" in ten articles, "intellectual disability" in six articles, "physical disability" in two articles, "deaf" in one article and "handicap" in none.

However, all the articles obtained with the terms disabled, "impairment", "intellectual disability", "physical disability", "deaf" and "handicap" only two new articles (one containing "disabled" and one containing "impairment") were obtained not already found using the terms "disabled people OR "people with disabilities". The other hits reflect already found articles such as all articles that contained the term "intellectual disability" also contained the terms "disabled people" OR "people with disabilities" or as in the case of the newspapers none of the found articles were relevant.

3.2. Qualitative Data Newspaper

As to our newspaper related searches mentioned only one article mentioned disabled people in relation to HIV/AIDS or HIV/AIDS and "health promotion" whereby all the other article did not contain relevant content such as mentioning HIV as a disability which was not the focus of our study or no linkage at all. This one newspaper article was titled "Everyone has the right to learn about safe sex" published by the *Toronto Star* in 1992 (Henderson, 1992). The author introduced the context of the article by stating "AIDS doesn't discriminate". The article highlighted efforts in British Columbia and Ontario to create networks and workshops to inform people with disabilities as well as caregivers and attendants on safe sex practices in regards to HIV/AIDS. According to the article, the efforts were funded by the "health promotion directorate".

3.3. Qualitative Data academic articles

As to our searches of academic articles n=19 academic articles were downloaded for analysis after the elimination of duplicate articles. Having read the n=19 articles, n=8 articles made no mention of disabled people in relation to health promotion and HIV.

Of the remaining n=11 articles, all n=11 articles stated that HIV health promotion as it relates to disabled people needs improvement. The subgroups of disabled people mentioned in these articles were: children with disabilities (deaf and hard of hearing, motor disorder, mentally retarded, blind and partially sighted, leprosy)[38], physically disabled adolescents [39], women with disabilities [40], deaf people [41], speech and hearing impaired [42], visual disability [39,43,44], physical disability [39,42,44], Attention Deficit Hyperactivity Disorder[45] and intellectual disability [42,46,47].

Of these n=11 articles, n=8 articles argued or provided evidence that disabled people have low HIV/AIDS literacy and have problems accessing HIV/AIDS information. N=7 articles made the point that disabled people exhibit the same sexual and other risky behaviors as their non-disabled peers. Kumar et al provided empirical data that made them to conclude that "ADHD may contribute to high risk sexual behavior and thereby also the risk of contracting HIV[45].

The n=11 articles [38-48] covered the countries of: Uganda n=2 [40,42], South Africa n=2 [39,44], Zambia [43], Swaziland [41], Ethiopia [38], Australia [48], India[45] and Britain [46]. One article did not focus on a specific country[47].

The article focusing on Britain covered the role of and competence of HIV prevention programs related to people with intellectual disabilities. The authors identified recognizing HIV risk, representing homosexuality, sexual identity and behavior, complexity of message, the reality and explicitness of image as key challenges for specialist residential support, sex education services and mainstream health promotion services. The authors argued that people with intellectual disabilities should be supported in their rights to "information and support for sexuality and sexual health" [46].

The article that focused on the country of Ethiopia argued that it is problematic that disability is dealt with as a medical issue whereas "social inequity, poverty, and

lack of human rights protection" problems that are "reflected in their health status" are ignored [38]. Sorsa's study revealed that children with disabilities lack access to HIV/AIDS information despite the fact that children with disabilities practice unsafe sex and are exposed to sexual and substance abuse which put them at risk of HIV infection. Sorsa called "for appropriate health promotion and disease prevention education for [children with disabilities] CWDs" [38].

Groce et al found that the deaf participants from Swaziland believed more in incorrect modes of HIV transmission and HIV prevention than the non-deaf participants. This study identified that 99% of deaf participants reported communication problems with healthcare facility staff [41]. Groce et al concluded that there is "the need for targeted HIV/AIDS education campaigns and improved accessibility in healthcare facilities for deaf sign language users in countries such as Swaziland" [41].

Kumar et al provided empirical data that made them to conclude that "ADHD may contribute to high risk sexual behavior and thereby also the risk of contracting HIV" [45].

As to the two studies from Uganda the first study asked people with disabilities how they felt about HIV/AIDS educational programs and found that accessibility to educational information was a problem and that the participants felt discriminated as people with disabilities [42]. The second article focused on young women with disabilities and access to HIV/AIDS and argued that "widespread misperceptions about the sexual behaviors of women with disabilities, exposure to violence and exclusion from health promotion activities and health services" [40] renders "women with disabilities, particularly young women with disabilities, disproportionately vulnerable to HIV" [40].

The study from Zambia concluded that "most visually impaired people lacked knowledge on the cause, transmission and treatment of HIV and AIDS resulting in misconceptions" and that discrimination, stigma, lack of employment opportunities, funding and poverty were seen as some of the causes visually impaired persons faced which influenced negatively their ability to access HIV and AIDS information. The study found also that "health promoters and people working with the visually impaired did not have specific HIV and AIDS information programs" [43]. The study found that the media were one channel through which the visually impaired accessed HIV and AIDS information [43].

As to the two studies from South Africa, Chappell's study focused on how peoples aged 15-20 with physical and visual disabilities in South Africa communicated with their parents and caregivers on the topic of HIV/AIDS based on the premise that health promotion strategies have been implemented in South Africa that aimed to encourage young people to talk about issues of sexuality and HIV with their parents/caregivers. The study found that young people resisted the efforts of parental and caregiver control. The author concluded that "young people with disabilities' perceptions of sex, sexuality and relationships are critical to efforts to more adequately educate parents/caregivers about message content and communication to help disabled youth make sense of love, sex, relationships and HIV" [44]. The

author argued further that "educational programs are needed for parents/caregivers of youth with disabilities that recognize young people with disabilities as 'capable social agents' and not just innocent vessels when it comes to sexuality and HIV" [44].

Maart and Jelsma made the point that disabled people are routinely excluded from mainstream health promotion activities in South Africa giving the example that the national policy of the Department of Education on HIV/AIDS in schools does not include learners in special schools. The study concluded that disabled adolescents are just as engaged in risky sexual behaviours, and are at equal risk of developing HIV than the non-disabled and therefore must be included in mainstream research and in health promotion activities especially to sex education [39].

Wells et al showed in their study that computer-based interactive multimedia programs are an efficacious means to provide behavioral health content, compensating for the dearth of available health promotion materials for people with intellectual disability [47].

The Australian paper concluded that "mass communication can maximize the impact of legislation by promoting awareness of new laws and, more importantly, lead changes in the attitudes of the polity and the wider public" [48]

4. Discussion

HIV/AIDS is still an epidemic [1] and the prevention of acquiring HIV is seen as the only path to an AIDS-free generation [49]. The UN Sustainable Development Goals have targeted to end the AIDS epidemic by 2030 under Target 3.3 [2]. Greenall et al reported that achieving target 3.3 is hindered by "services failing to reach vulnerable and excluded populations" [50]. Our findings suggest that Target 3.3 as it relates to AIDS is also hindered by how HIV/AIDS health promotion academic and newspaper literature engages with disabled people and that changes in the coverage is needed if the academic and newspaper discourses are to contribute in a positive way to target 3.3.

4.1. The issue of academic invisibility

Policies are to be informed by evidence generated through research [51]. Disabled people are highly impacted by policies and by the choice of evidence generated to inform policies [52]. Our findings from our analysis of the coverage of HIV/AIDS and health promotion for disabled people in academic literature suggests that health promotion linked actions and studies did not lead to published academic evidence that could inform policies such as how to design health promotion actions so that they increase the HIV/AIDS literacy of disabled people and the literacy of non-disabled people of HIV/AIDS vulnerability of disabled people. The concept of health literacy is crucial for individuals to attain education about HIV/AIDS and this can be implemented through academic literature transitioning into community outreach efforts for HIV literacy [53]. Given that HIV/AIDS is still a public health issue and disabled people still face risks and problems related to HIV/AIDS we conclude from our study that studies are needed that provide data on HIV/AIDS

prevalence among disabled people and best practice data on how to perform HIV/AIDS health promotion in relation to disabled people.

4.2. The issue of newspaper invisibility

From our analysis of Canadian newspapers, one can draw three possible conclusions from the lack of reports by the newspapers on HIV/AIDS health promotion and disabled people in Canada: a) there were no HIV/AIDS health promotion activities related to disabled people in Canada that the newspapers could have report on; b) there were HIV/AIDS health promotion activities related to disabled people in Canada but the newspapers were never aware of them, or c) the newspapers were aware of HIV/AIDS health promotion activities related to disabled people in Canada but did not view this information as important to report. All three possible conclusions suggest a failure of HIV/AIDS health promotion activities within Canada.

One of the main goals of health promotion is to increase health literacy [22]. At the same time, newspapers are a major source of health information for the public [24] and have the ability to shape public beliefs and perceptions [25]. If conclusions (a) and (b) are true, there is a need for people involved in HIV/AIDS health promotion activities in Canada to provide newspapers with data on HIV/AIDS and disabled people to ensure that data on HIV/AIDS and disabled people reaches the public reader. If conclusion (c) is true, a possibility that would fit with prior studies that highlighted the problematic coverage of disabled people in newspapers [54,55], that is a problem more difficult to fix but efforts have to be undertaken to fix the lack of interest of the newspapers if conclusion 3 is the problem.

Although there are an increasing number of outlets available for young people especially, to be informed about HIV/AIDS (i.e. Facebook), many of these sources will likely be used only after the person has been impacted by HIV/AIDS. As such, these outlets do not work for preventative measures, they do not increase the HIV/AIDS literacy of the general community of disabled people, and they do not increase HIV/AIDS literacy of the general public in relation to disabled people.

5. Conclusion

Given our findings there is a need for more studies that provide evidence on best practices to fix the HIV/AIDS literacy problems exhibited on and by disabled people. The study from Wells et al provided some thoughts [47] but more studies are needed that provide evidence on working strategies for improving HIV/AIDS literacy. More efforts are also needed by health promotion strategies to ensure that the public education mandate performed by newspapers is eliminating the invisibility of disabled people in relation to the coverage of HIV health promotion. We submit that ethics theories and principles can be used to question the invisibility of social groups such as disabled people in the coverage of a topic that impacts them. It might be useful to have more literature that uses explicitly the phrase "ethics of invisibility" a phrase that appeared eleven times in our Google Scholar search. Without thematizing the problematic situation of disabled people within health

promotion with the intent to rectify the problems such as the low literacy around HIV and disabled people present within and outside the disability community, can decrease the autonomy of disabled people. Without literacy and knowledge on the topic for example, disabled people cannot really make informed decisions whereby informed decisions are part of being autonomous. The lack of autonomy is further jeopardized when this information comes from sources that may be biased or have stereotypical views of disability and disabled people. Given our findings it might be useful to extent the study towards other media types and to other geographical settings and to obtain views of members of the HIV/AIDS health promotion community and disabled people involved in HIV/AIDS discourses to understand better the findings of our study and how to fix it.

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Is Organ Farming a Panacea to Organ Crisis? Ethical Implications

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Abstract

Organ transplantation is one of the greatest achievements of science in the 20th century. This medical breakthrough is challenge with non-availability of organs for candidates on the waiting list, for organ recovery and transplant. Organ farming is the scientific method of using animals, such as pig, as an incubator in which to cultivate healthy genetically human organs. Such farming could to close the widening gap between the supply and demand for organs. This subject, however, entails ethical debate over the moral justification and the permissibility of organ farming. This paper will argue from a consequentiality standpoint that, if organ farming should turn out to be good for the greatest number of persons, then it should permitted to avert organ crisis and help to reduce the high death rate among candidates on the waiting list for organ recovery.

Key words; organic farming, organ transplant, organ recovery, organic crisis, DNA, Xenotransplant, organ allocation.

Introduction

Joseph Edward Murray (April 1, 1919 – November 26, 2012) was an American, philosopher and a plastic surgeon, who performed the first successful kidney transplant (Tullius, 2013 p. 6). Before his death, Dr. Murray trained and inspired surgeons who are today achieving great exploits in the business of organ transplant.

Since the first organ transplant, scientists had been relying on human-to-human organ donations, for candidates on the waiting list for organ recovery. This method of organ harvesting has been unable to keep up with the high level of demand for viable organs.

To close the gap between the demand and supply of organs, there is a need for organ farming which could, ideally, eliminate the black market for organ trafficking, as well as the need for organ harvesting among prisoners (Antonio, 2017: p.3).

For instance, the cadaveric organ donation which represents 80% of organ donation around the world, is based in many countries on a presumed consent (Stela Živčić-Ćosić, et al, 2013). The World Health Organization (WHO) defines; “presumed consent” as a system that permits ‘material’ to be removed from the body of a deceased person for transplantation. However if objection is filed, the informed party reports is presented, in this sense the deceased definitely voiced an objection to donation. (Aparna, 2015:p.3).

For some moral philosophers, the idea of presumed consent is illogical because it aids conscription. The default position is that anybody who wishes to donate an organ, acted altruistically for the good of the society, and this requires explicit consent of the donor, in some case his family (Aparna, 2015: p.3). Additionally, supporters of presumed consent argue “the campaigned for one such change – the move to “presumed consent.” Instead of relying on people to volunteer, registration would be automatic, but with an easy opt-out” (Guardian, 2009; p.8). In this sense, families of the deceased would still be entitled to prior consultation, and have a right to refuse.

Furthermore, a presumed consent occurs when a deceased person did not make any written statement against donation; hence, organ harvesting against the donor’s wills could be tyrannical or constrictive organ donation. Constrictive organ donation is a philosophy that affirms forceful and compulsory organ donation, because the individual’s body and organs are, owned by the State (Aparna, 2015: p.3). This approach is illogical and it is not compatible with individual freedom, dignity and a betrayer of the tenets of democracy.

In my opinion, conscription form of organ donation is a recipe for totalitarianism, if the family of the deceased is not consulted before any ‘material’ could be removed from the body of the deceased. In this sense, it is totalitarianism; the absence of the rule of law; the use of force to implement government decisions on the citizens, thereby suppressing individuals’ freedom. Totalitarianism denounces democracy and usually portrays forms of authoritarianism. “state decision-making and ideology are not framed by the ordinary

citizens, i.e., a pervasive scheme of values are announced and promoted by institutional means to control and direct all aspects of life State” (Aparna, 2015:p.3).

Explicit Consent

Segen (2012) argues thus: “Explicit consent is a clear and voluntary indication of preference or choice, usually oral or written, and freely given in circumstances where the available options and their consequences have been made clear (informed consent). As defined in the UK, express consent constitutes formal permission to undergo a diagnostic or therapeutic procedure, or to allow use of personally identifiable information for research, epidemiology, financial audit or administration, publication and/or to release into the public domain. Without express consent, use of such materials is limited to teaching and training” (n.p.)

The World Health Organization (WHO) defines explicit consent, as a system in which “cells, tissues, or organs may be removed from a deceased person if the person had expressly consented to such removal during his or her lifetime” (Aparna, 2015: p.3). However, it is no longer news that many people do not record their decision to be an organ donor.

Unfortunately, many organs are buried rather than donated; the reason for this loss is because, inter alia, potential donors and their families fear that the distribution of donated organs is unfair, and also that potential donors may receive less aggressive medical care. This fear, of course, has contributed to worsening the organ crisis (Aparna, 2015: p.3).

Additionally, philosophical analysis of organ crisis in American and Israel 1999-2010, would suggest that the efforts of these governments to increase organ donation in their states has persisted.

Father (2011) argues thus, “In 1999, some 40,000 Americans were on the waiting list for kidney transplantation. By 2009, the list had grown to nearly 83,000 people, whereas only 16,500 people received a transplant. In Israel, the number on the waiting list for kidney donors has increased from 490 in 2006 to 690 in 2010, while the number of kidney transplants from deceased donors decreased from 87 to 65. At the same time, there was an increase in live kidney donations from 54 to 78. Thus, taking into account transplants from both deceased and living donors, there is only about one donor for every five potential recipients, both in Israel and in the USA, 2010”. (p.3).

A critical question arises at this juncture how long would the world continue to depend on organ donations from human to human donations, yet disappointing! Must we continue to experience organ crisis, while many candidates continue to die on the waiting list for organ recovery and allocation. We think the scientific community thinks outside the box to providing an alternative source of organs donation, instead of relying solely on human donors.

In my view, the panacea for organ crisis is genetic ‘organ farming human-pig-chimeras’ not the “mythical chimera.” Organ farming has the ultimate goal to generate surplus organs that would be genetically identical, human organ-matches from different species, and would encourages human/animal interrelation in anatomy, DNA, physiology etc. These will moreover, go a

long way to averting the death of candidates on the waiting list for organ recovery and allocation. In addition, organ farming will make organs available and sufficient for human transplant.

Philosophical Foundations of Xeno transplantation and Organ Farming.

Hetero transplantation also referenced as Xeno transplantation. Xenon is a Greek word meaning "foreign." Xeno transplantation is the transplantation, or infusion into a human lives cells or organs from a nonhuman species (Kress, 1998 p.32). Xenotransplantation has been instrumental in the treatment of human organ failure. The rationale behind xenotransplantation research is, motivated by the fact that the demand for human organs for clinical transplantation far exceeds the supply, this has led to organ crisis. For the purpose of understanding and illumination the concept of organ farming, let us review literature on xenotransplantation.

Hindu mythology and religion, introduce its own version of xeno transplantation. Hindu literature affirms a cross-species in organ transplantation (human-animal Chimera). Perhaps, the pre- historical mythologies of the Hindu people on xeno transplantation were made without any knowledge of the species barrier. Cooper (2012) argues thus, "*Xeno transplantation was the attempt by Daedalus and his son, Icarus, to fly across the sea from Crete to mainland Greece with the help of bird wings attached to their arms. Icarus failed in the attempt, and Reemtsma put this forward as a possible case of hyperacute rejection (very rapid rejection of the graft), though he thought it was more likely to be related to failure of a thermolabile adhesive. However, Daedalusy successfully made the journey, providing this pair with an enviable 50% success rate*" (p.2).

In 17th century, xeno blood transfusion was temporary banned in France, reason been that a disinterested experiment was performed by Jean Baptist. Jean Baptist experiments, the transfusion of animals' blood into human body. Indeed, the result of the experiment was unaccepted. Currently, with the improvement on xeno transfusion researcher, animal blood such as pig, could be successfully transfuse into the human body with a proper scientific monitor to avoid the transmission of infectious diseases to the recipient (Cooper, 2012. p.3).

Additionally, in 19th century, a scientific literature reports that the salice of rabbit transplanted into a child with renal diseases. However, the child did not live because of the immunological basis of the organ rejection. However, today, with the improvement in xenotransplant research including immunosuppressive drugs, organ transplant from animals to human will be achieve without hindrances (Bailey, L.; Nehlsen et al, 1985: p.3323).

Without missing words, Organ farming is an offshoot of the scientific innovation in xenotransplantation. Xeno transplant researchers are currently making a giant stride to address the problem of organ scarcity because of Human-to-human organ donations and transplant. The cross species transplantation of organs has been impracticable to sustain the fore seeable future, because human immune system built to rejecting external organs.

Organ farming through genetically modified pigs is invoked as a panacea to the organ crisis. Heather (2015) argues thus, "*A farm in Virginia, a company called [Revivacor](#) is breeding pigs that have some genetic similarities to humans. The scientists call them "GalSafe pigs" and they have added five human genes to the pigs' livers, kidneys, and hearts. The hope is that the organs can be harvested and used for transplants, and that human bodies won't reject them*" (p.3)

Lastly, surgeons at the National Heart, Lung, and Blood Institute, in Bethesda, Maryland are currently investigating Revivacor's pig breeding centre. In a unanimous decision, the "surgeons managed to keep one of Revivacor's genetically modified pig hearts alive inside a baboon's stomach for 945 days" because there is a possibility of its organs matching with human DNA (Heather, 2015:p.3). However, with the transplanting of a pig organ into the primate, is a great scientific breakthrough in xeno transplantation and this presents a great future for the cross species and organ transplantation.

Organ Farming Human-Pig-Chimeras

A group of scientists from the department of Biological Science at the University of California in the United States reported in "[the journal Cell](#)" and "*MIT Technology Review*" they have successfully implanted human stem cell into the embryonic stage of a pig blastocyst. This scientific attempt is to create a hybrid, a chimera that could be pig pancreas, kidney, liver, heart etc., for human transplant (Robby 2017: p1) (Antonio, 2017).

The scientific breakthrough in genetic organ farming, in my view is a wise exploration of inter-species sources for organ donation; because it presents a great opportunity for scientists judiciously use nature for the benefit of man.

Robby (2017) posits thus, "*The UC scientists had used CRISPR gene editing to remove from a newly fertilized pig embryo the DNA responsible for growing a pancreas, creating a "niche," or a gap, into which human cells could be inserted. Next, they took human induced pluripotent (iPS) stem cells — adults stem cells regressed so that they can once again grow into any kind of human tissue — and slotted them into the niche*" (p.1).

The experimental of organ farming however, involves the fusing of human stem cells into a pig embryo, and then allows these cell to gestate for up to four weeks in surrogate sows, the scientists are trying to grow organs from different genetic make ups called "chimeras" in order produce tissue which is sufficiently human for genetic match (Antonio 2017:p.1).

The scientific breakthrough in organ farming will provide a foundation, and a shine of hope, to reduce organ crisis and it encourages human interspecies chimeric' relationship. Rita (1999) cites Wolfensohn & Lloyd thus; "*All use of animals in scientific research for human benefit creates a dilemma the justification for using the animal depends on it being different from the human, while the validity of the results obtained depends on the similarity of the animals and their responses to those of the human*" (p.1). Organ farming will help to explore further the humans and animals relationship, their anatomic compatibility, and physiology, DNA etc.

these remains the best for human and animal clinical investigation. For this reasons, organ farming should be accepted and allowed to flourish for the good of man.

Organ Farming Debate

In antiquity, most ancient Greeks, who used animals for experiments, did not think about the moral relevance of their actions, nor did they raises questions about the moral justification and permissibility of animal research. They believed thus, *"Likeliness of humans to their anthropomorphic deities granted them a higher ranking in the scala naturae ("the chain of being"), a strict hierarchy where all living and non-living natural things—from minerals to the gods—were ranked according to their proximity to the divine"* (Nuno, 2013:p.2).

The above postulation attributed to humankind the rank of the highest and the most superior species in the hierarchy of beings. Additionally, the assertion also had supported the teaching of most medieval Christian thinkers. The Judeo-Christian teaching about humans presumes dominion over all nature, as represented by the texts of Augustine of Hippo, Thomas Aquinas and other influential Christian thinkers of the Middle Ages (Nuno, 2013:p.2).

For Saint Augustine a Christian theologian, "animals were part of a natural world created to serve humans (as much as the "earth, water, and sky") and humankind did not have any obligations to them" (Nuno, 2013:p.2). The above assertion disagree with Singer argument that animals share equal moral status with human beings (eating animals is wrong only if the animal suffers when it is slaughtered. An animal who is killed without suffering is acceptable as food; hence, all Kosher meat is (Steven, n-d:p.1).

Today, there is plethora of unsettled ethical issues about organ farming; these have led to various critical questions, from biomedical animal right campaigners, religious body etc. Apparently, there are questions about the moral justification of breeding pigs in order to generate human tissue. In some quarters, there are also questions and worries about the handling of pigs' tissues and its compatibility with human DNA.

In my opinion, we must guard against yuk-factor arguments in responding to reports of scientific breakthroughs in organ farming. Scientists are attempting to insert human stem cells into pig embryos in order to produce organs for transplant at a much higher rate than donations have hitherto provided. In considering the morality of inter-species organ transplants, we must weigh the cost of the human lives that would otherwise be lost.

"For those, who views experimentation of animal as inalienable right of the human being? The right corresponds increasingly to certain concomitant rights for animals, since 'cruelty' should always be combated, given that it is kind of behavior pertaining to the sphere of morality and based on evidence from the scientific domain itself, animal well-being has a positive influence on the results of experiments" (Rita 1999:p.2).

Biomedical Argument

Organ Farming is a scientific process that facilitates the creation and growth pigs' stem cells, genetically modified for humans use. (Synopsis organic farm, 2014: p1). The 'chimeras-breakthrough' in surgical

implantation, antigens of the donor-animal is a serious challenge, *"Human body would immediately reject a pig organ as foreign, the "transgenic" pigs are genetically altered with human DNA in the hope that a human recipient's body will be fooled into thinking the organ is human"* (Synopsis organic farm, 2014:p.1).

The biomedical argument also takes into cognizance the likelihood of introduction/invasions of new diseases in humans and pigs because of the difference in the DNA (Robby 2017: p.2).

Additionally, there is the possibility that human cells might wind up in a pig's brain. This could cause who-knows-what kind of problems (Robby 2017: p.2). Robby (2017) quotes Pablo Ross, a xeno transplant researcher who told the British Broadcasting Corporation (BBC) last year; "We think there is very low potential for a human brain to grow, but this is something we will be investigating"(p.2). The views of scientists on this project of organ farming seem positive for the future, because the xeno transplant doctors, researchers and medical ethicists, are working closely to provide improved medications to suppress xeno transplantation with cyclopropine to neutralize the antigens. It is possible that improved treatments for various brain injuries and diseases could be improve from the research being carry out on pig brains (Synopsis organ farm, 2014:p.1).

A critical examination of organ farming, some scholars have argued that it will lead to human gene editing and manipulation of the genome. For these reasons, organ farming should not be permitted. In my view, the approval of organ farming does not me it cannot be sufficiently regulated by the government to avoid harmful consequences, it is a hard, and sober a life to manipulate the genome! It is an obnoxious practices to manipulalet the genome, we therefore argue that genome manipulation be regulated by law (Sprague et al 1956:p.522).

Animal Right Campaigners

"Animal Liberation," 1975, is a book written by an Australian philosopher Dr. Peter Singer. The book has aided in animal rights campaigns, although Singer himself is not an advocate of "rights" for animals, but rather merely that animal suffering deserves consideration in our moral reasoning, much like human suffering, although animal suffering is always outweighed by human suffering."

It is noticeable that the key to the understanding of Singer's philosophy, especially on Animal liberation is utilitarian sensibilities and assumptions, which form the backbone of his work (Steven, n-d: p.1). Additionally, Singer's work has played a vital role in shaping the contemporary animal rights debate, and has influenced hundreds of thousands to become vegetarians and animal rights activists.

In *Animal Liberation*, Singer raises questions about the moral status of animals, eating animals is wrong only if the animal suffers when it is slaughtered. An animal who is killed without suffering is acceptable as food; hence, all Kosher meat is acceptable to Singer (Steven, n-d:p.2). Singer would argue, "The ability of animals to feel pain and pleasure puts them on a plane with humans.

Whether or not animals can author treatises on mathematics, they, like us, feel pain, and we therefore have an obligation not to cause them needless suffering" (Steven, n-d:p.2).

Today, xeno transplantation is under attack by animal rights' groups, why the experimentation of animals for organ farming. Nevertheless, a critical review of organ farming, it does no 'needles suffering' to animals, if I may borrow singer's words from above.

Animal activists denounce the experimentation on animals such, as pigs in the name of scientific advancement (Synopsis organic farm, 2014: p.2). However, it seems unreasonable to condemn in totality the use of animals for biomedical research, in light of its contributions and benefits to humankind. One must also admit that animal subjects at times suffered serious harm during the process of scientific research. Rita (1999) cites Kant animals do not belong to the sphere of human morality, (p.4). This argument might be subjective, but the question remains thus; can animal and humans have equal moral value?

The debate on organ farming precedes question on moral status of an animal, scholars may agree that animals have a moral status; for this reason, it is wrong to abuse, hurt or make them feel pain, but there must be exploration for the benefit of humanity. We may not in any way denying animals' ability to feel pain just like humans. For moral reasons; we argue that animal research and experimentation should be well thought-out and humans should never "use animals as they please, treating them in a way which best suits us; for their nature is not like ours" (Nuno, 2013:p.4). This assertion posits that the human use of animals as a means to an end is morally unjustifiable.

Considering the moral status of animals, common sense would tell us to reduce animal suffering by avoiding the repetition of experiments on single or particular animals. According to Rita (1999), citing Hall's principles, the organ farming experiments should only be performed when simple observation cannot provide an answer. In addition, unnecessary repetition of experiments should be avoided (p.4). The continued repetition of the experiment on a particular animal will amount to animal cruelty because such a scientist has subjected the animal to a continuous pain and terror. Nuno (2013) cites Aquinas who says that cruelty to animals ought to be condemned, because it can cause humans to build up feelings and actions of cruelty towards other humans (p.2).

Utilitarianism

The xeno transplant researchers do not completely refute the charges made by an animal rights advocate. "We have to be honest about this: We are exploiting these pigs." Says Dr. David White, director of research at 'Imutran' in Cambridge, England, "but, I believe it's far more justifiable to exploit these pigs in order to save people's lives than for the production of food" (Synopsis organic farm, 2014: p.2). This is a consequentialist worldview, the experimentation of pigs to produce human organs. Common sense would tell us that the good done to human beings outweighs the harm done to animals, Thus; even when researchers had strong misgivings about inflicting suffering on animals, benefit

to humans remains a valid justification for them to pursue their scientific goals through organ farming (Nuno, 2013:p.4). While this might be too extreme scientist must outweigh the consequences of their actions, taking into consideration the xeno transplant researchers experiments to ensure the least possible suffering of animals during and after organ farming.

However, a critical examination of the organ farming debate of shows that these arguments leave both sides frustrated, particularly doctors, researchers and animal rights campaigners frustrated because the more time wasted on organ farming debate, and a without a scientific breakthrough in organ farming experimentations, the more candidates die on the waiting list.

Utilitarianism was first formulated by Jeremy Bentham and developed by John Stuart Mill; according to Steven (n-d), "utilitarianism" holds that the morally best action is that which brings about the greatest amount of pleasure or happiness to the greatest amount of people) (Steven, n-d:p.1). This view says that the most important feature of an action is the consequences, rather than the intention or motivation behind it.

Organ farming is for the benefit of man; for this reason, utilitarianism has been a humanistic philosophy that cannot be over rule in this research. Moral action is that which results in the highest overall "wellbeing" for all stakeholders (Nuno, 2013:p.4). Here, Organ farming should be permitted and is morally justified, provided the research has "a determinate object, beneficial to humankind, accompanied with a fair prospect of the accomplishment of it," thus admitting that humans have precedence over other animals, limited by the due consideration for animal suffering, and is acted-upon for the interest of large numbers of persons (Nuno, 2013:p.4).

Lastly, it is rational to maintain that human interests take precedence over animals. Also, it will be a basis for philosophical arguments to be used twenty-first century xeno transplant researchers, as an ethical justification for the use of pigs for the farming of human organs in order to avert organ crisis and reduce the rising number of deaths among candidates on the waiting list of organ recovery and allocations.

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safety so it is expected to reduce the incidence of sharp injury.

Keywords: sharp safety, sharp injury, curriculum, health worker

Background

Work accidents due to sharp stabbing (sharp or needlestick injury / NSI) is one of the many problems that occur in health workers. On the safety evaluation conducted by the National Audit Office at NHS Hospital UK in 2003 found 17% of events related to needlesticks or sharp injury (National Audit Office, 2003).

In a follow-up survey conducted on 4,000 nurses at the Royal College of Nursing (RCN) in 2008 found that 48% of nurses had experienced NSI or sharp injury (RCN, 2008). In a study conducted in the United States found that more than 8 million health workers in hospitals exposed to blood or other bodily fluids, including through contact types such as wounds with contaminated sharp instruments (Askarian et al, 2011). In Indonesia, in the study of 114 health workers in 10 health centers in Jakarta found approximately 84% of officers had been stuck needles used (Hudoyo, 2004).

The incidence of sharp injury in health workers may increase the risk of spreading infection of blood-borne pathogens such as hepatitis B, hepatitis C, and human immunodeficiency virus (HIV) (CDC, 2008). In 2003, the World Health Organization (WHO) recorded cases of infection due to contaminated needle puncture was estimated to result in 21 million hepatitis B virus infections (32% of all new infections), hepatitis C virus infection of 2 million (40% of all new infections), and HIV infection of 260,000 (5% of all new infections) (WHO, 2003). In a study conducted in Indonesia on health workers at puskesmas in DKI Jakarta, the prevalence of HBsAg positive was 12.5% in the dentist group and 13.3% in laboratory workers, whereas prevalence among health workers was generally around 4% (Hudoyo, 2004)

In addition to the increased risk of spreading the infection, sharp injury may increase the costs incurred by healthcare providers. These costs include serological examination for follow-up investigations, consultation and diagnosis to health personnel, as well as affecting the work time of health workers. In addition, the costs incurred for initial treatment of health workers affected by Hepatitis B, Hepatitis C and HIV were also considerable (Adams & Elliott, 2006).

Sharp safety is a safe procedure in the use and utilization of sharps in health services (Foley & Leyden, 2002). Such procedures include prevention in the form of safe use of sharps, personal protective equipment, prudence, understanding of health personnel, removal of sharps waste according to procedure, and vaccination. In addition to prevention, also obtained follow-up procedures are performed if the incidence of incident sharp injury is recording and reporting, examination of exposed health workers, and monitoring and evaluation. A good regulation of sharp safety is also needed to reduce the incidence of sharp injury (Adams, 2012). Given the magnitude of the effects and risks of sharp injury to health personnel, a sharp safety curriculum is required to be implemented for health workers.

Sharp Safety Curriculum for Health Workers

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Abstract

Sharp injury is a sharp stabbing event that is very risky to health workers. The incidence of sharp injury is still high in the world. This event can lead various implications such as the spread of infection, psychological and economic implications. This is influenced by the understanding of health workers about the importance of sharp safety.

Sharp safety curriculum consists of seven main topics, i.e. safety device, safety procedures, safety disposal, implications of sharp injury, prevention of infection by vaccination, regulation relating to sharp safety, reporting, monitoring, and evaluation of sharp injury. Sharp safety curriculum is needed to increase knowledge and understanding of health workers regarding sharp

Results

In the curriculum about sharp safety, there are two main things that are important to note that is learning objective and mapping concept.

Learning Objective

Sharp safety is a safe procedure in the use and utilization of sharps in health services (Foley & Leyden, 2002). The sharp safety curriculum is needed with the goal of health workers being able to identify tools that can cause sharp injury and safe means of use, be able to identify actions that can cause sharp injury and how to perform safe actions, be able to define the spread of infections due to sharp injury, able to mention the implications of sharp injury events, knowing the role of vaccinations in sharp injury events, knowing the ways and benefits of post sharp injury reporting, knowing the ways and benefits of monitoring and evaluation post sharp injury events, and knowing regulations related to sharp safety.

Mapping Concept

In sharp safety, there are 7 things that must be considered so that health workers can avoid sharp injury events, namely safety devices, safety disposal, safety procedures, sharp injury implications, vaccination, regulation, reporting, monitoring, and evaluation.

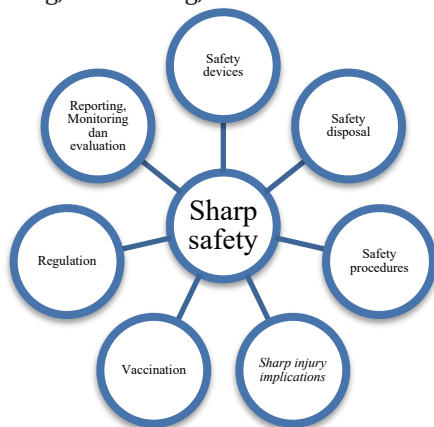


Figure 1. Components of sharp safety's curriculum

Safety Devices

Jagger et al (1988) mentioned that there were 326 occurrences of NSI in one of the educational hospitals in Virginia, USA. Some of the tools that can cause sharp injury include disposable syringe and needle, intravenous tubing and needle assemblies, pre-filled syringe cartridges, winged steel IV sets, vacuum tube phlebotomy assemblies, iv styles, and other devices. In the study mentioned that the highest cause of NSI is the use of disposable syringes (35%). In the study has not mentioned other tools that cause sharp injury such as a knife or scapel at the time of operation.

In the use of safe tools, there are two types of tools that can be used are active safety devices and passive safety devices. Passive safety devices do not require the additional safety required in use, while active safety devices require additional safety (CDC 2008). There are four major factors in evaluating the security of a device:

security, usability, suitability, and assurance that it does not cause other problems (Adams & Elliott, 2003).

Safety Procedures

Cone (2000) identifies actions that often cause NSI to be injection, venipuncture, suturing, manipulating intravenous (IV) injection parts, inser- ting peripheral IV catheters, other medical procedures. In the study mentioned that the action of injection is a procedure that often causes NSI. In another study conducted by McGeer et al (1990) reported that 13-62% of NSI was due to venaseksi. In addition, NSI events in doctors, health workers, and laboratory personnel are often caused by flebotomy procedures. Gaffney et al (1992) mentioned that 72% of physicians had experienced NSI during flebotomy within 6 months and less than 5% of reported events. Cardo et al (1997) mentioned that the risk of infection transmission due to NSI caused by depth injury.

Safety disposal

In addition to the use of safe objects, removal of sharps that have been used also has an important role. Foley and Leyden (2002) have identified processes to reduce the risk of exposure to blood-borne pathogens such as elimination of hazard, engineering control, administrative control, work practice control, and personal protective equipment.

Sharp injury infection and implication

Blood-borne pathogene infections can occur in sharp injury. Department of Health (DH) in 2006 advocated the early treatment of wounds caused by sharp objects. DH does not recommend mentioning that sucking the wound with the mouth. If the splash of blood on the eyes or the mouth should be immediately irrigated or rinsed with water, If the contact lens in the eye then should be drained water before and after it is released. Health workers should follow established procedures established in the hospital.

Some infectious diseases such as human immunodeficiency virus (HIV) and hepatitis C virus (HCV) are potentially infectious to health workers. In Italy, an organization incorporated in the Italian Study Group for Occupational Risk of HIV Infection reported a study in 1982-1992 that mentioned almost half the incidence of HIV and HCV transmission. In France, the Institut de Veille Sanitaire, mentioned that 11 out of 13 HIV incidents and 22 of 63 HCV occurrences were related to blood retention. It was generally reported that 106 out of 106 HIV positive cases and 238 suspected HIV cases were identified as a result of transmission to health personnel. Research conducted in December 2002 stated that as many as 128 (37.2%) occurred in nurses, 42 (12.2%) in physicians, and 39 (11.3%) in laboratory personnel.

In addition to affecting the safety of health personnel, the incidence of sharp injury also affect the cost or cost incurred. Handling of sharp injury events often requires a greater cost than the cost when prevention. These costs include serological examination for follow-up investigations, consultation and diagnosis to health personnel, as well as affecting the work time of health workers. In addition, the costs incurred for initial treatment of health workers affected by Hepatitis B,

Hepatitis C and HIV were also considerable (Adams & Elliott, 2006). The incidence of sharp injury can also affect psychological health workers even significant. Health workers who wait for post lab test results exposed to sharp injury often experience pressure or stress is high enough. Costigliola et al (2012) conducted a study of 634 nurses from Europe and Russia who had experienced NSI due to injection of diabetic patients. They point out that the incidence of sharp injury affects their emotional state such as depression, sudden cry, tension in the family, problems with spouses and families, panic attacks, anxiety and inability to work.

Vaccination

Vaccination is important in dealing with exposure to infection of blood born pathogens. The sharp safety guidelines published by the Centers for Disease Control and Prevention mention that full hepatitis B vaccine is necessary for health workers (CDC, 2008)

Regulation

On 11 May 2013 EU Member States implemented the Council Directive 2010/32 / EU regulations. The implementation includes Framework Agreement on factors related to NSI and sharp injury covering safe type of device and procedure. In addition, the identification of the principle of safe use of equipment and disposal and discussion of regulations to improve security and reduce the NSI. EU member states agree to prevent sharp injury and infection in the public and private sphere. Some of the things that need to be done are risk assessment (are there any risk of exposure to blood-borne pathogens from NSI? Can these risks be minimized or eliminated?), Risk elimination and prevention, elimination of unnecessary sharps, identify whether exposure risks can be decreased by use of safe tools, improved education and caution, and ensuring proper and safe sharps disposal systems. Ensure that regulation or procedure is in place.

In Indonesia, Health and Safety (K3) is an effort to protect workers and others entering the workplace against the hazards of accidents. The purpose of Health and Safety (K3) is to prevent, reduce and even eliminate the risk of occupational diseases and accidents and improve the health of workers so that work productivity increases. Law No.36 of 2009 on Health article 165 states that workplace managers are obliged to undertake all forms of health efforts through prevention, improvement, treatment and recovery for workers. Based on the above article, the workplace managers at the Hospital have an obligation to nourish the workforce. One of them is through work health efforts in addition to safety work. Law no. 36 of 2014 on Health article 11 letter (d) also states that health workers in carrying out their practice obtain protection for occupational safety and health. One of them is through work health efforts in addition to safety work. Hospitals must ensure health and safety both to patients, service providers or workers and the surrounding community from various potential hazards, therefore the hospital is required to implement Health and Safety (K3) efforts that are implemented in an integrated and comprehensive so that the risk of disease and Work Accident Accident in hospital can be avoided (Ministry of Health RI, 2010).

Monitoring and Evaluation Sharp Injury

When health workers are exposed to sharp injury, there are several important things to do namely reporting and recording. It is necessary to monitor the injury and identify the necessary next steps. This action is often underestimated by health personnel and many health workers who do not report the incidence of NSI or sharp injury so it is not directly addressed. The process of reporting and recording should not only occur local but also done regionally to nationally. It is also useful as a means of evaluating the spread of infectious diseases of blood borne pathogens. Post-reporting and recording of NSI events should be performed immediately such as laboratory tests or antiretroviral administration. It is also related to the responsibility of health care providers to their health workers. Further monitoring is also required in this event and there should be a standard procedure to be implemented. Risk assessment should also be conducted primarily for HIV transmission, HBV and HCV transmission. Blood in the body is a fluid that often causes infections in health personnel, though other body fluids such as cerebrospinal fluid and pleural fluid may also be at risk. Percutaneous exposures are more at risk than contamination of the mucosa. In addition, contamination may also occur through conjunctiva. The average risk of HIV occurrence in NS incidence was <0.5%.

Conclusion

The curriculum concerning sharp safety needs to be developed and implemented to health personnel including learning objective, and mapping concept curriculum. The curriculum is needed to improve the understanding and awareness of health personnel so as to reduce the incidence of sharp injury.

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