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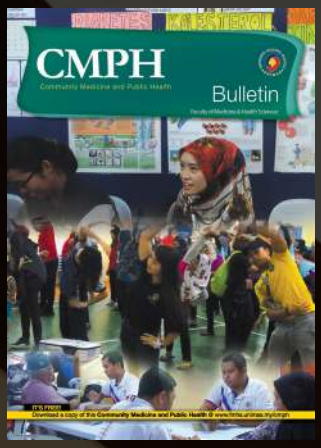

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RABIES IN SARAWAK: A WAKE-UP CALL AND A MAJOR CHALLENGE FOR ALL

ANDREW KIYU

Department of Community Medicine and Public Health
Faculty of Medicine and Health Sciences
Universiti Malaysia Sarawak

The dates 29th and 30th June 2017 were etched forever in the history of public health in Sarawak. Those were the dates when rabies made itself known to the people here. On the afternoon of Thursday 29th June 2017, Sarawak General Hospital informed Sarawak Health Department that there were three possible cases of human rabies in the wards. Samples were hand-delivered to the Institute for Medical Research on the morning of 30th June and by that afternoon, the worst fears of the clinicians were confirmed. The samples from all the three cases were positive for rabies (The Borneo Post. July 1, 2017). It was a rude wake-up call for all.

The human and animal health sectors were aware of the existence of rabies in Kalimantan, especially West Kalimantan, that shares a common border with Sarawak. We had been lulled into complacency because routine surveillance of canine rabies by the State Veterinary Services showed Sarawak to be still free of rabies until 2015. This surveillance stopped in 2016 apparently because the Veterinary Research Institute in Ipoh informed Sarawak to reduce the number of canine samples for rabies to be sent there to allow the Institute to cope with the samples related to the control of the outbreak in the northern states of Peninsular Malaysia (OIE, 2015). Thus 2016 was a "blind" year for rabies surveillance in Sarawak.

Rabies was not on the diagnostic horizon of clinicians and public health staff in Sarawak because it had been free of rabies all these years. The possibility of rabies only surfaced after the parents of one of the patients mentioned that the patient was bitten by a dog sometime in May 2017. Investigations by the health team found out that the staff at the clinics in the villages were aware of the increase in dog bite cases but did not think of reporting the matter to the higher levels (Ho Ai Chia, personal communication). Rumour surveillance failed to be activated.

In the past, animal movements, including dog movements across the border between Kalimantan and Sarawak were hampered by natural barriers such as dense jungles. However, the opening of land along the border in Serian District made cross-border access for dogs and other animals easier. Indeed, the first few human cases were among children from villages that were close to the border with Kalimantan. Thus, the agriculture, economy and environmental sectors have to be mindful of the fact that their actions can have adverse consequences to health and social sectors.

The animal health sector was also unprepared for rabies emergence in the state. The Department of Veterinary Services Sarawak was formed on 25th January 2017, after years of being part of the larger Agriculture Department. In June 2017, there were only eight Government Veterinary Officers and around 70 more in the private sector practising in private veterinary clinics, feed mills, drug and veterinary supply companies, and one lecturing in a local university in Kuching. Their resources were a major challenge in the management of the rabies outbreak (Sarawak State Disaster Management Committee, 2018).

The Local Authorities were also unprepared. They had the service of one public health doctor to head the Health Section of Local Authorities at State Level. Their staff had to be trained on how to catch and handle stray dogs and proper equipment had to be acquired for the job. The enforcement of the Local Council Ordinances regarding dog ownership and the handling of strays were almost non-existent.

The community too, must change their relationships with dogs. In the rural areas virtually, all dogs were free-roaming, even if they were owned. Gone were the days when the dogs were used to help hunt for wild animals to feed the family. In the urban areas, free-roaming dogs were everywhere, and they had been tolerated in the past. It is time to start with a clean slate and aim for no free-roaming dogs especially in our urban areas, like the situation in developed countries. This is the ultimate animal kindness as all the dogs will be with their proper owners instead of being dumped and left alone to scavenge in the streets.

As at the time of writing, 28 locations in Serian, Kuching, Samarahan, Sri Aman and Julau Districts had been declared as rabies-infected areas. For the health sector and for the purpose of dog-bite management, the whole of these districts has been treated as rabies infected. Over 200 dog bite cases a week were still being notified to Sarawak Health Department (SHD, 2018).

The Sarawak State Disaster Management Committee has been the main coordinator for the Departments, agencies and other stakeholders involved in the outbreak management since July 2017. A multi-sectoral plan of action for the elimination of canine rabies by 2020 had been developed (Sarawak State Disaster Management Committee, 2018). Control measures were being taken to prevent the further spread of rabies within the currently affected districts and to ensure that it did not spread beyond that. A buffer zone was created beyond Sibu by removal of free-roaming dogs and mass vaccination of owned dogs in the areas (The Borneo Post. February 3, 2018). This is an evolving outbreak and only time will tell whether these activities to create the buffer zone have not been a case of too little, too slow and too late.

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Corresponding author:
Professor Dr Andrew Kiyu
Department of Community Medicine and Public Health
Faculty of Medicine and Health Sciences,
Universiti Malaysia Sarawak
Email: kduandrew@unimas.my

Professionalism, Independence and Safe Care

ABDUL RAHIM ABDULLAH

Department of Community Medicine and Public Health
Faculty of Medicine and Health Sciences
Universiti Malaysia Sarawak

ABSTRACT

Healthcare professionals apply professional discretion, a central pillar of our professionalism and independence. Without it, we cannot take our place between our clients and their needs. Professionalism is not just a privilege but is also a burden of self-regulation. Our "independence" reins in the powers of law, policy makers and administrators, and protects the ordinary citizens against state apathy or even excesses. Our effectiveness depends on what we make of it, assure best practices, and that bad practices will not turn people into unwitting morbidity and mortality statistics. It is not enough to have the concept of 'professionalism' (and independence) enshrined in our tradition and corporate culture. The integrity and reputation of our profession is at stake. Given the nature of healthcare, there is nothing that can effectively replace this concept of professionalism and independence but there may be other things that we need to complement it. First, we need to convince ourselves of our own merit and competence before we can convince others that we are good enough for the task we exist for.

"While individual doctors remain highly trusted, the profession needs to demonstrate better its overriding duty to serve patients' interests and to show that it can respond to changing public and political expectations. To sustain and build trust in the profession, doctors need to ensure that their practice reflects the behavior expected of them" (Rosen & Dewar, 2004).

Healthcare professionals take responsibility for their judgements and the consequences and the public is well aware that absence of professionalism is harmful to their interests (*Kim, 2015).* Any professionals, including those in the medical and health profession, has theoretically, sound reasons for interpreting and applying their professional judgments. "Discretion" is a central pillar of our professionalism and independence. Without it, we would be merely an extension of our profession's legislature, policies and rules, and hence, we cannot take our place between our clients and their needs (Mathews & Pronovos, 2008). Professionalism is a privilege and a burden of self-regulation. Self-regulation is a basic tenet of all professions, and few professions value that principle as much as the field of medicine and health.

This "independence" gives credence to our roles as a 'check and balance' - it reins in the powers of law, policy makers and administrators, and protects the ordinary citizens against state apathy or even excesses *(Roger, 2003).* Furthermore, our effectiveness depends on what we, as professionals, make of it, and only we can ensure that the best practices have effect and that bad practices will not turn innocent people into unwitting morbidity and mortality statistics.

But in today's world — where people are more sceptical of expertise and risks, where conflicts of interest abound, where the public demands greater transparency from all professions, where news of high profile medical scandals can viral in seconds, the concept or idea of granting the professionals complete freedom of their respective profession is becoming more difficult to *sell* (Hafferty, 2006).

Nevertheless, it is not enough to have the concept of 'professionalism' (and independence) enshrined in our tradition and corporate culture or even policies, rules and legislation (Kennerley, 1993). As professionals, we cannot fulfil our functions by simply being inducted into our

positions, no matter how powerful and well empowered the institution of our profession might be. The honours (titles) that we bear are not merely rewards of years of endeavour, hard work and experience but these are also symbols of responsibilities, accountabilities and governance. Again, this independence is both a right and a privilege as well as an obligation that is designed to serve and protect patients and must be supported by all members of the profession (Emanuel & Pearson, 2012).

Specialists in respective fields, define themselves by their conduct and their competence, skills and expertise - not the uniform or white coat, nor the stethoscope and any other fancy or regalia symbols of our position. Good management does not arise with the mere existence of us - it comes about as "a process" and "an outcome" of our work, our experience, knowledge and our proficiency within the existing system - a system that we can change by continuous improvements in a constantly changing world. The individual professional and the institution he/she works within, through in-built learning and knowledge creation processes, must explore the frontiers of knowledge not just for our patients / clients but also in our eternal pursuit for truth, the absolute truth (Kasher, 2005).

But the very aloofness of our traditional independence has left some, within our profession, to be out of touch with the changing needs of the societies and communities over which we claim to be responsible/ "guardian angels". In addition, there is a problem with this collegial form of professional "regulation" in that professions tend to be protective of their respective members *(Lawton & Parker, 2002).* In reality, not surprisingly, individuals belonging to any group tend to be protective of their own kind and even though adequate to ensure most were good, it has fatal problem of bad apples who are not willing or indifferent to delivering on their professional commitments and betrayed the trust of both their patients and peers (Polder & Jochemsen, 2000).

We know for a fact that past traditions and codes of practices, by themselves, cannot establish us into a special icon, but the integrity and reputation of our profession is at stake. Given the nature of healthcare, we cannot move away from professional self-regulation and there is nothing that can effectively replace this concept of independence but there may be other things that we need to complement it (Bertkau, Halpern & Yadla, 2005). However, firstly, we need to convince ourselves of our own merit and competence before we can convince others that we are good enough for the task we exist for. Otherwise, other people (and possibly robots) will soon takeover our roles, if they have not done already, and topple us from our pedestal.

The wide discrepancies (of quality) which have resulted in the name of discretion will not reinforce the notion of our independence as healthcare professionals in anyone's mind. The freedom society has conferred us is to be effective, equitable and just - not to 'waver' (and lacking in quality control) in our judgments. But the privilege of professional freedom comes with a responsibility to keep our house in order. One way is for the healthcare profession to make a greater effort to understand the causes of disciplinary actions against physicians and find ways to reduce the behaviours that lead to them (Emanuel & Pearson, 2012).

Another way that healthcare professionals can build the public trust is to do a better job of monitoring the quality of the care they provide. We may contend there is no way to be objective (measured) about consistency and will resist any attempt to 'hamper' our freedom such as the use of QAP/ISO 9000 practices and implementing accreditation programs. Policies and "management guidelines for quality control" require us to collect data reflecting performance that we are capable of doing what we are supposed to. Otherwise, the competency and behaviour may merely be assumed to be sufficient and problematic professionals are able to practice for a long time until a horrendous scandal erupts.

We resist these (policies and guidelines), claiming increase costs, too demanding and detracts from patient care resulting in unthinking summary practice. This is what will be if we allow 'outside/external' (especially not from our own profession) to prescribe it whilst presiding in policy making at top level or making judgments in jurisprudence medico-legal and civil cases *(Rogers, 2003).* We must do it ourselves or get ourselves to be active major players.

But too many inconsistencies, discrepancies and infallibility in decisions have arisen to cast doubts over our competence and our humanity. This is more often a symptom of variable skills and expertise, in caring, in teamwork and in professionalism rather than an expression of our discretion and independence. With healthcare turning into "for profit" business even including in the public sector, these issues have become more transparent to a more affluent public.

So far, Malaysia's healthcare policy has worked to save untold misery in the prevention and cure of illnesses in its mission towards making Malaysians healthier. But in

the hands of uncaring individualistic professionals, such healthcare policies and our profession's integrity and reputation would be in jeopardy.

The primary concern for professionalism is to promote patient safety in healthcare delivered by teams of professionals who need to communicate well, respecting the principles of honesty, respect for others, confidentiality and responsibility for their actions (Warnock, 2008). Let us be seen standing up and be counted because there is no professional freedom without sacrifice, and self-regulation (Crues & Cruess, 2005). As Luke [Skywalker] would say "the price of freedom is eternal vigilance".

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Corresponding author

Prof Dr Abdul Rahim Abdullah

Department of Community Medicine and Public Health

Faculty of Medicine and Health Sciences

Universiti Malaysia Sarawak

Email: aarahim@unimas.my

Satisfaction on Clinic Services among Rural Iban Community in Durin, Sibu, Sarawak

AYE AYE AUNG, ABDUL RAHIM ABDULLAH, ARNOLD, T., NOORNAJWA NABILAH, Y.,AND GROUP

Department of Community Medicine and Public Health
Faculty of Medicine and Health Sciences
Universiti Malaysia Sarawak

ABSTRACT

Introduction: Patient's satisfaction on clinic services are vital which can give the overall view of the quality of care of the clinic. The objective of this research is to determine the level of satisfaction of clinic services among selected Iban longhouses in Durin, Sibu, Sarawak. **Methods:** A cross-sectional study was conducted in three selected Iban longhouses named Berendam, Jalan and Unting in the district of Durin, Sibu, Sarawak with a total sample population of 198. Universal sampling method was used, and the data were collected by using interview-based questionnaire. **Results:** Response rate was 38.3% and the mean (SD) age of respondents was 40.4 (19.91). About two-thirds of the respondents were female respondents. All the respondents were Iban which 85.5% of them were Christians, 72.5% were married and 40.6% were employed. More than half of the respondents (56.5%) received secondary education and above. The mean household income was RM1041 (1054.70). The respondents received the information of health-related issues mainly from television (55.1%) and health staffs (50.7%). Among 69 respondents, only 57 respondents had utilized clinic services for the past 12 months. Their overall mean (SD) satisfaction score was 87.6 (13.33) in which the highest satisfaction was on consultation received from doctors/health staff, followed by pharmacy services, registration process and lastly registration waiting area. There was no significant difference in mean satisfaction score between gender, religion, marital status, educational level and occupation. **Conclusion:** This study is essential as to provide information for healthcare service providers in order to monitor and improve the quality of medical care in the future.

Keywords: Satisfaction, clinic services, rural Iban, Sarawak

INTRODUCTION

Primary healthcare is an approach and philosophy is centred on a number of core principles for providing services that support health. Effective primary healthcare is community-based, promotes healthy lifestyles as a route to disease prevention, provides continuing care of chronic conditions and recognizes the importance of the broad determinants of health (Health Council of Canada, 2013). Public sector health services in Malaysia are centrally administered by the Ministry of Health (MOH) through its central, state and district offices. Other government departments also provide health services to specific populations. For instance, the Ministry of Higher Education runs the university teaching hospitals, the Ministry of Defence has several military hospitals and medical centres and the Department of Aboriginal Affairs provides health services to the indigenous population in collaboration with the MOH. Malaysia has an active civil society with many non-government organizations (NGO). For example, the Red Crescent Society and St. John's Ambulance provide mainly emergency ambulatory and relief services; the Lion's Club contributes to rehabilitative services; and the Family Planning Association provides reproductive health services. The private health sector provides mainly curative and diagnostic health services in urban areas. In fact, most primary care in urban areas is currently provided by private practitioners. In Sibu, there are 19 of private dental clinics and retail pharmacies, as well as a growing number of private hospitals. Since independence, the government and the MOH has

emphasized reaching rural areas with services, including primary care and dental services (Jaafar et al., 2012).

The MOH health clinics provide four components of primary health care: curative, preventive, promotive and rehabilitative services through both static and mobile clinics. The MOH family health services include maternal and child health services such as antenatal and post-natal care, clinic delivery, and family planning, pap smear and health education. Approximately, 1.1 clinics per 10,000 population provide home visit services which are mostly provided by the government clinics (91.2%) and about half of the services provided by the private clinics (45.6%) (Ministry of Health Malaysia, 2012). In addition, the clinics also provide basic emergency services managed by paramedics and 90% of the clinics are equipped with ambulance (Healy et al., 2013). Pharmacy services are also available in all health clinics which are run by pharmacists in large urban clinics or assistant pharmacist or assistant medical officer in smaller rural clinics. Rehabilitation services are provided in most government health clinics. Over 66% of all clinics provide occupational health services with the private sector providing the bulk of the services. The government also promotes a community-based approached to help the elderly to remain living at home assisted by the 225 NGO clubs for elders based in government health clinics.

In Sarawak, the foundation of healthcare delivery system is the static health facilities which covered around 70% of the population while mobile units such as the Flying Doctor Service (FDS) and Village Health Teams (VHT) have 90% access to the village. Village Health Promoter Programme is introduced to allow fundamental healthcare to be carried out in remote areas. The government also have introduced two-tier referral system whereby cases which required further treatment can be referred from health clinics to hospitals. Despite the challenge in remote population, Sarawak is regarded as delivering good healthcare (Khoo, 2007). Two programs are particularly notable in improving access to healthcare: the FDS and MOH mobile health team. The Sarawak state had a population of 2.5 million whereas Sibu comprises of 299,768 population (Department of Statistics Malaysia, 2010). The Dayak community – Iban and Bidayuh which accounted for about 40% of the state population, is predominantly living in the interior of Sarawak, typically in longhouses (Khoo, 2007). Due to this scattered population and almost inaccessible to healthcare in the urban area, the state is operating 187 rural public health clinics. These clinics run as 'one stop' family health centres that deliver integrated health services which consist of maternal and child health, outpatient care and environmental sanitation. These health clinics is facilitated with rest beds and birthing facilities in order to promote safety childbirth among rural mothers.

The type of health clinic in an area relies on the size of population. Health clinics are classified into Type 1, Type 2, Type 3, Type 4, Type 5 and Type 6. Type 1 to Type 4 health clinics are large clinics located in urban area which are managed by family medicine specialist or medical officers. These clinics provide outpatient care, maternal and child health care, dental care and rehabilitation care. Moreover, laboratory service and radiological unit are also available there. There is also presence of dedicated pharmacy unit.

Currently, Type 1 health clinic is not available in Sarawak. Type 2 clinic is only available in Kuching which is Petra Jaya Health Clinic. In Sibu, Lanang and Oya Health Clinics are the Type 3 clinic.

Type 5 and Type 6 clinics such as Nanga Lassi clinic are smaller health clinics which served between 1500-3000 patients. These clinics are managed by allied health personnel without medical officer with limited services (Sarawak State Health Department, 2017).

Patient satisfaction is truly an important guide to measure the service quality. Dissatisfaction hints the opportunities for service enhancement (Yunus et al., 2013). By understanding the patients' needs and expectations, healthcare organisations will be able to tailor services to patients needs and expectations. There was significant relationship between patients' satisfaction on clinic services and social demographic profile such as age, gender and occupation. For instances, elderly group was the most likely to be pleased compared with younger age group (Hassali et al., 2014).

Sarawak being the biggest state in Malaysia with the widest distribution of population and geographical terrain faced a great challenge in delivering primary care service nationwide (Azizah Azhar, Md Mizanur Rahman & Mohamad Taha Arif, 2016). Persisting health issues among the rural Iban community is still on the rise as seen in child malnutrition, anemia and intestinal parasite infection, which was speculated on the poor health education and low healthcare service utility due to inaccessibility (Eunice, Cheah and Lee, 2014; Rajoo et al., 2017). To date, little study was done to assess the level of utilization and satisfaction on clinic services in Sarawak. These studies are of utmost importance as healthcare utilization has

particular relevance as a public health and development issue. The satisfaction on clinic services by the longhouses community affects by its utilization by the community. Good utilization of health services improves the health status of the population. However, the presence of health facilities alone is not enough as the perception on services provided in clinics and socio-demographic profiles of a community can affect the utilization and satisfaction of the clinic services (Singh, Haqq & Mustapha, 1999). Therefore, this study is to determine the level of satisfaction on clinic services among selected rural Iban community in Durin, Sibu, Sarawak.

METHODOLOGY

The selected study area was three Iban longhouses namely Berendam, Jalan and Unting longhouses located at Durin sub district in Sibu division, Sarawak, Malaysia with a total population of 198. Respectively, Berendam has 84 residents, 26 residents in Jalan and 88 residents in Unting. The study was conducted from 12th June 2017 until 10th September 2017.

Universal sampling method was used in this study, in which our inclusion criteria were residents who were 7 years old and above, visited the private or government clinics for the past 12 months. For respondents below 18 years old, their parents were interviewed on their behalf as a proxy. Respondents who were not able to communicate and refuse to participate were excluded.

The data was obtained by using interview-based questionnaire, either in Malay or Iban language. The data of the respondents included demographic profile and the level of their satisfaction towards the services provided. Pilot testing was done at Kampung Merdang Gayam, Samarahan, Kuching, Sarawak on 11th July 2017. We have taken a minimum of 30 respondents from this Iban village for our pilot test.

Different stage of health clinic services which were considered to have a significant effect on visitors' satisfaction level, like registration process, registration waiting area, consultation received from health personnel and pharmacy services were measured on five-point scale of Very Dissatisfied (1), Dissatisfied (2), Uncertain (3), Satisfied (4), Very Satisfied (5). The score was calculated for each respondent and level of satisfaction was measured in terms of mean score. These mean scores were analyzed with respect to different socio-demographic characteristics.

Data was entered and analyzed by using SPSS version 22. Descriptive statistics was used to analyze the data and results were presented by mean ± SD for quantitative variables and frequencies with percentages for qualitative variables in tabular form. Mean score technique was used to show the satisfaction score of the participants. Independent sample t-test was used to compare two categories for mean score and One-Way ANOVA test for comparison of more than two categories on the basis of mean score. P-value < 0.05 was considered significant.

All respondents who consented to the study were informed of their rights to refuse or withdraw without giving any reasons. Respondents were guaranteed anonymity and all information provided was treated with confidentiality.

RESULTS

The response rate was 38.3% (69 respondents of total 180 population sample). Sixty nine respondents had history of going to the clinic regardless of time frame. Meanwhile, among those particular 69 respondents only 57 respondents had utilized the clinics for the past 12 months.

Socio-demographic characteristics

Table 1 shows the socio-demographic profile of the respondents. The mean (SD) age of respondents was 40.4 (19.91). Female respondents account for 62.3% of all respondents.

Table 1 Socio-demographic profile of the respondents (N=69)

Socio-demographic characteristics	N	%
Age (SD) years 40.4(19.91)		
Sex		
Female	43	62.3
Male	26	37.7
Religion		
Christian	59	85.5
Others[i]	10	14.5
Marital Status		
Married	50	72.5
Single	19	27.5
Education Level		
Secondary and above	39	56.5
Primary education	18	26.1
No formal education	12	17.4

Occupation		
Unemployed[iv]	28	40.6
Employed[v]	41	59.4
Household income (RM)[vi] (n=50)	50	1041 (1054.70)
Source of information of health-related issues[vii]		
Television	38	55.1
Health Staff	35	50.7
Radio	27	39.1
Newspaper	14	20.3
Books/Journals	8	11.6
Internet	7	10.1

[i]includes no religion and Islam
[ii]includes unmarried, divorced, widow/widower
[iii]includes secondary school, STPM/Matriculation/ Diploma and Degree
[iv]includes housewife, pensioner, and student
[v]includes government and private sector employee, farmer and self employed
[vi]Conversion rate of 1MYR = 0.24 US Dollar
[vii]Multiple response question

Level of Satisfaction of Clinic Services

Table 2 shows the level of satisfaction of clinic services mean (SD) according to four domains of satisfaction of clinic services; the highest satisfaction was on consultation received from doctors/health staff with 25.2 (4.74) and the lowest was on registration process with 21.3 (2.72).

Table 2 Level of satisfaction of clinic services according to four domains (N=57)

Items grouping (No. of statement)	Mean (SD)	Min –Max Score
The satisfaction of registration process (5)	21.3 (2.72)	5 – 25
The satisfaction of registration area (5)	19.7 (4.21)	5 – 25
The satisfaction of consultation received from doctors/health staff (6)	25.2 (4.74)	6 – 30
The satisfaction of pharmacy services (5)	21.4 (3.53)	5 – 25
Total score	87.6 (13.33)	21 – 105

Association between Socio-demographic Profile and Satisfaction of Clinic Services

Table 3 showed the association between socio-demographic profile and satisfaction of clinic services which was not statistically significant.

DISCUSSION

The purpose of this study was to determine the association between socio-demographic profile of occupants of the selected three Iban longhouses and their level of satisfaction on clinic services. As for demographic characteristics, this study showed that there was no significant correlation between patient satisfaction and age of patient (p=0.136) which was similar to another study by Sharifa Ezat et al. (2010) in Malaysia. We found that the older age group has slight higher satisfaction level compared to younger age group. This was possibly due to elders expect less of healthcare services while the youngers would express dissatisfaction and expect more from the services, which probably linked to their previous experience attending better service quality healthcare. Other possible cause was the respondents were mostly from older age group which then contributed to better satisfaction score. Between gender, there was no significant difference in mean score of satisfaction between male and female (p=0.590). This study showed that the mean satisfaction score among female was slight higher than male. This possibly due to better quality of service received by both sexes; more satisfaction among female which might be due to more female respondents and females visited clinics more often for maternal and child health.

Table 3 Association between socio-demographic profile and satisfaction of health services (N=57)

Socio-demographic profiles	Mean (SD[a])	t-stas (df[b])	p-value
Age 0.136[d] r = 0.200			
Gender			
Male	86.4 (13.5)	-0.54 (55)	0.590[c]
Female	88.4 (13.3)		
Religion			
Christian	88.5 (11.6)	1.20 (55)	0.233[c]
Others	82.7 (20.4)		
Marital status			
Living with spouse	88.5 (13.1)		0.355[c]
No spouse	84.8 (14.1)	-0.93 (55)	

Education level			
No formal education	94.6 (9.5)	2.57[e] (2)	0.086[c]
Primary	88.8 (11.4)		
Secondary and above	84.4 (14.6)		
Occupation			
Employed	87.4 (11.2)	-0.06 (55)	0.952[c]
Unemployed	87.7 (15.0)		

[a]standard deviation [b]degree of freedom
[c]p value for independent t test
[d]p value for correlation test
[e]f-stats

In a local study conducted in urban area, male have higher mean satisfaction score compared to female (Sharifa Ezat et al., 2010; Afzal et al., 2014). In contrast, our study showed that female respondents were more satisfied than the males. This may be because the rural women has less expectation on quality of services.

For marital status, there is no significant difference between marital status and satisfaction of healthcare service. Married respondents had higher satisfaction, supported by study done at Pakistan and Malaysia (Afzal et al. 2014; Yunus et al. 2004). However, marital status was not a strong predictor for satisfaction with primary healthcare service. Non-formally educated respondents have highest satisfaction which is supported by research done by Afzal et al. (2014). There is no significant difference between educational level and satisfaction of healthcare service. This result is consistent with the study conducted in Malaysia and Northern Ireland (Pitaloka and Rizal, 2006; McCrea and Wright, 1999). These studies mentioned higher satisfaction on non-formally educated respondents is most likely due to the lower expectation on the healthcare services from the respondents. In occupation, the result showed that respondents who are unemployed have higher level of satisfaction compared to those who are employed, however it is not statistically significant. This is because the mean satisfaction score difference between employed respondents and unemployed respondents is very minimal. A similar study in Malaysia found the same non-significant association between employment status and satisfaction on public healthcare service because of too small percentage of the unemployed respondents (Hassali et al., 2014). As there are multiple patients' presentations and attitude, the inert factors which including marital status, occupation and so on were not be the first noticeable things by the healthcare personnel. It did not affect the way on how they are treated by the healthcare personnel (Sharifa Ezat et al. 2010).

Regarding the mean satisfaction scores of respondents of each domain, the respondents were satisfied with the registration process. About 92.9% were satisfied with the attitude of the registration staff on their informative explanation process and courtesy towards customers. Whereas about 80.7% respondents were satisfied with registration waiting time. Joshi et al. (2013) stated that patients waiting in outpatient clinics were often the major reason for patients' complaints regarding their experiences in outpatient clinics. Therefore, patient satisfaction with waiting time plays a crucial role in the overall satisfaction with services. This study showed the similar response when registration waiting time had 10.6% of dissatisfied respondents. Another comparable study by Sharifa Ezat et al. (2010) which the highest satisfaction percentage was respondents perceived the staffs were informative at 84.8%, lower than that of registration waiting time.

The result in our study showed that the lowest satisfaction mean score was on registration waiting area. This is probably to the small waiting area, lack of facilities and dissatisfied cleanliness of the registration area. The cleanliness and facilities available in the registration area influence the patients' general satisfaction with healthcare services (Hassali et al., 2014). Furthermore, long waiting time with a poor environment facility and poor cleanliness can result in dissatisfaction among patients as shown in a study done by Kaur et al. (2016) in Malaysia. The same study also proved positive association between patients' satisfaction with facilities and waiting environment of healthcare services (Yunus et al., 2004). Therefore, setting up a good system and creating a neat environment of waiting area can reduce dissatisfaction among patients during waiting.

The highest satisfaction mean score was for consultation received from doctors or health staffs. The highest satisfaction percentage was doctors or staffs being informative (93.0%), followed by physical examination conducted by doctors or staffs (91.2%) while the lowest satisfaction score at 75.4 % for punctuality of doctors or staffs. Similarly, a study by Haliza, Rizal and Raja Jamaluddin (2003) in Negeri Sembilan showed only 55.3 % accounted for satisfaction on interpersonal skills among doctors and staffs in private clinics of the state. Contradicted with Sharifa Ezat et al. (2010) in Selangor where they found that the least satisfied dimension was professionalism and

continuous caring among doctors and staffs. This present study showed that the respondents appreciated the vivid explanation given by doctors or staff but were slightly not satisfied with punctuality of the doctors or staff. This is possibly due to extended consultation time given per patient or simply not enough consultation rooms. Hence the highest dissatisfaction percentage in this domain was punctuality of doctors and staffs and waiting time for consultation at 15.8 %.

Regarding the level of satisfaction of pharmacy services in clinics, a study by Hassali et al. (2014) found that most of their respondents were neither satisfied nor dissatisfied with the pharmacy services. This finding contradicted with our study which revealed that the respondents were satisfied with the overall pharmacy service. Different expectation and socio-demographic profile might be the factors that influence their satisfaction as the former study was conducted in the state of Kedah. Another study by Noor Hazilah and Nooi (2009), showed that their respondents were just satisfied with the atmosphere of the pharmacy. In our study, very minimal respondents were dissatisfied with the waiting time (15.8%) and prescription guidelines by the pharmacists (8.8%). Despite this, the respondents were very satisfied with the overall pharmacy service. This might be because other components including operating hours, self-appearance and politeness have stronger influence on the overall satisfaction level. Pharmacists' attitude and convenience were found to strongly influence patient satisfaction positively (Kamei et al., 2001).

This study has several limitations. Firstly, this research only included those who went to the clinic for the past 12 months; there may be recalled bias as some of the respondents might not exactly remember their experience during their last visit. The sample was also small because many of the longhouse respondents did not visit the clinic for the past 12 months. Measuring satisfaction itself can be difficult due to its subjective nature whereby each individual perceives satisfaction at different angle. Interviewer bias may happen because respondents tend to give positive responses to please the interviewer also all interviewers are medical students which may contribute to the bias. Hence, further research can be carried out by making the point of entry at clinics to attain a larger sample size. Also, the satisfaction and utilization of hospital services should also be included to acquire a better perspective pertaining to the overall quality of healthcare services.

CONCLUSION

This study is meant to determine the association between socio-demographic profile and level of satisfaction of clinic services among residents of selected three Iban longhouses. The study findings showed that all of the respondents in these longhouses were satisfied with clinic services. Based on data analysis, the level of satisfaction of clinic services was not influenced by the socio-demographic profile of the respondents.

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Group Members: Arnold, T., and Group Noornajwa Nabilah, Y., Nur Adirah, A., Nyanesh, R., Low, R., Tham, J. J. M., Yeap, Y. N., Lim, T. E., Nur Farrah Anima, M., Mohd Amirul Husni, J., Nor Aida Syuhada, M. F., Nur Syamimi Y., Lee, J. X., Zul Hisyam Fikri, I.

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Corresponding author

Dr Aye Aye Aung
Department of Community Medicine and Public Health
Faculty of Medicine and Health Sciences,
Universiti Malaysia Sarawak
Email: aaaye@unimas.my

RESEARCH PAPER

DIETARY DIVERSITY AND BODY MASS INDEX AMONG ADULTS OF RUMAH PANJANG BANYING AND RUMAH PANJANG DINGUN, SIBU, SARAWAK

ZAINAL TAMBI, MOHD TAHA ARIF, SYAHIRAH FJ AND GROUP

Department of Community Medicine and Public Health
Faculty of Medicine and Health Sciences
Universiti Malaysia Sarawak

ABSTRACT

Introduction: Rising trend of obesity among adults in Malaysia has become a major concern of public health recently but its relationship with dietary diversity and sociodemographic profile remains a question. Hence, this research is to be carried out to assess the dietary diversity and its association with body mass index (BMI) among the adults of Rumah Panjang Banying and Dingun in Sibu. **Methods:** Data was obtained from two longhouses in Sekuau, Sibu. Study outcome variables were sociodemographic factors, dietary diversity and BMI. **Results:** Mean age of the respondents was 46.6. Majority of respondents were married (73.3%) and of Iban ethnicity (98%). Most of the respondents (84.2%) had high level dietary diversity, the remaining 15.8% of the respondents had medium dietary diversity and none of the respondents had low dietary diversity. There was no association between sociodemographic profiles and dietary diversity. About 58.4% of the respondents were obese. There was significant correlation between respondents' age and BMI. There was no significant difference in mean BMI between the medium and high dietary diversity groups. **Conclusion:** Majority of the respondents had a high level of dietary diversity. There was significant correlation between age with BMI and BMI were not influenced by dietary diversity level. Future research is recommended to include other long houses in the same area to increase the sample size.

Keywords: Dietary diversity, BMI, nutritional status, Sarawak

INTRODUCTION

Dietary diversity is a qualitative measure of food consumption that gives an expression on household access to a variety of foods and is also a proxy for individual's nutrient adequacy of the diet (Kennedy, Ballard and Dop, 2010). In recent years, the dietary diversity score (DDS) is one of a deductive defined dietary index used to assess overall diet quality. DDS can be measured by a Household dietary diversity score (HDDS) or by a Food Consumption Score (FCS), or at the individual level (IDD), in which case it can be measured by an IDD score (IDDS). Household dietary diversity score (HDDS) is the number of different food groups consumed by a household over the preceding 24 hours. It is a proxy indicator of the household food access which was originally developed to measure food security. Validation of household dietary diversity has been established to be a good indicator of calorie consumption by a household and a proxy for income (Ruel, 2017) by looking at the ability of the household to cover basic energy needs of its members. HDDS or FCS does not specify any target and is relevant in any population group. An improved outcome in areas such as birth weight, child's anthropometric status, and haemoglobin concentrations can be contributed by a more diversified diet with factors of caloric and protein adequacy, percentage of protein from animal sources and household income. On the other hand, the individual dietary diversity score (IDDS) is used as a proxy measure of the nutritional quality of an individual's diet. Young children and women of childbearing age are more specifically targeted because of the importance of micronutrient adequacy for growth, development and protection of the foetus and infant. The higher the DDS, the more likely the woman or child to have a diet that meets its daily micronutrient requirements.

Nutrient requirements differ with age, sex and physiological condition. Recommended Nutrients Intakes (RNIs) are nutrient standards that may be used to plan and assess dietary nutrient intakes. Ministry of Health Malaysia (2017) recommended 13 new nutrients, making a total of 30 nutrients as compared to the 17 nutrients in the previous publication. Macronutrients such as carbohydrates, proteins and fats and micronutrients such as minerals, calcium and vitamins are equally importance in maintain of good health. Practice of diverse diet is the stronghold in order for the body to absorb most of essential nutrients in a balanced portion. Studies have proved that the diverse diet meliorate the overall nutritional quality (Torheim, Barikmo, and Parr, 2003).

Body Mass Index (BMI) is an easy and widely used measurement to evaluate the nutritional and overall

health status (Ka & Khan, 2007). A study by Azmi et al. (2009) revealed a significant rise of BMI of Malaysians aged between 18 to 59 over a period of 6 years and increment of overweight prevalence in Malaysian adults for about twofold. From a similar study, it showed that prevalence of overweight for woman was second highest for Bumiputera Sarawak (31.6%), which was preceded by Indians (32.6%). According to Azmi et al. (2009), Bumiputera Sarawak had been high up in the list as the ethnic group with second highest prevalence of overweight in Malaysian adults. A study had shown that the proportion of underweight was the same as overweight with significantly higher in women (25%) as compared to men (13.8%) (Haemamalar, Zalilah and Neng-Azhanie, 2010). The prevalence of overweight and obesity in the rural population (41.8%) were nearly the same as in the urban population at 43.5% (Haemamalar, Zalilah and Neng-Azhanie, 2010). Rural populations used to be considered at a lower risk of overweight and obesity than urban population, but the situation may have changed due to influences of urban lifestyle. According to a study done in rural village in Northern Malaysia, it revealed severe imbalances in dietary constituents among the villagers at the lower socioeconomic level with 40% having income less than RM500 and another 40% between RM500 and RM1000 (Ka & Khan 2007).

Sarawak as the largest state in Malaysia has a population of 2.5 million whereas the total population of Sibu district is 198,239 in 2017 (Sarawak Government, 2010). Sarawak is made up of more than 40 sub-ethnic groups, each with its own unique language, culture and lifestyle. The major ethnic groups are Iban, Malay, Chinese, Melanau, Bidayuh and Orang Ulu. Among these ethnic groups, the Ibans comprise the largest percentage which is 30.3 % of the total population in Sarawak (Sarawak Government, 2010). This research was conducted in two rural Iban villages, Rumah Panjang Banying and Rumah Panjang Dingun located at Sibu division. A study of nutritional status of adults in rural villages in Northern Malaysia conducted by other researchers has shown that overweight and obesity were trending compared to under-nutrition which contributed to some significant ill health such as non-communicable diseases. The recent statistic published by the Institute for Public Health (2015) reported that prevalence of overweight and obesity in adults in Malaysia has increased. However, research on the assessment of dietary diversity and its evidence in relations with the nutritional status and socio-demographic among the adults in rural villages is limited. Therefore, the objectives of the present study are to determine the sociodemographic profile and dietary diversity pattern of the adults. This study also aimed to determine the sociodemographic factors associated with dietary diversity and BMI among adults. Another purpose of this study is to analyze the relationship between the dietary diversity and BMI.

METHODOLOGY

Study area

This research was conducted at two longhouses, Rumah Panjang Banying and Rumah Panjang Dingun, located at Jalan Oya, Sekuau, Sibu. It was under Sibu Rural District Council and located 45 kilometres distance away from Sibu Town. The distance from Integrated Learning Facilities (ILF UNIMAS) to Sekuau was about 50-minute drive.

Study design and duration

A cross-sectional study was carried out for 10 weeks, which was from the second week of September, 2017 until the third week of November, 2017.

Study population and sample

The study population consisted of adults of Rumah Panjang Banying and Rumah Panjang Dingun, which has 40 and 23 doors (households) respectively. Majority of the population were Iban and the main occupation were farmers.

Inclusion and exclusion criteria

All the residents of longhouses who were able to communicate and adults at the age 18 years old and above were included in the study. Exclusion criteria includes adults who were absent during data collection, terminally ill and could not make a response due to physical disabilities for example deaf and dumb (Nega et al., 2015) and those who were not willing to participate in this study.

Sample size and sampling method

Total number of adults' residents in Rumah Panjang Dingun was 48 whereas in Rumah Panjang Banying was 91 giving a total population of 139 adults. Universal sampling method was used in this study. It was decided to take all the adults in each household in both longhouses as our respondents and they were interviewed individually based on their presence at time of visit and interview

Data collection instrument and procedure

Data was collected using questionnaire written in English, Malay and Iban. The questionnaire was comprised of three sections. A consent form was given to the village head earlier for approval to do this study. Consent form was given to all eligible adults individually. A face-to-face interview was done with each respondent. For Section A, sociodemographic questions would be elicited. For Section B, the respondents were asked to recall all the foods and beverages taken in the past 24 hours prior to interview session. The scores for dietary diversity were calculated using the information from the 24-hour dietary recall based on sixteen food groups (Kennedy, Ballard and Dop, 2010). For Section C, anthropometric instruments

were used to take height and weight measurement. Height measurement was taken using height rod in centimetres (cm) and body weight measurement was taken using weighing scale in kilograms (kg). BMI was calculated by using formula (kg/m2).

Pilot study

A pilot study was conducted based on 30 sets of proposed questionnaires to adults in Kampung Entingan, Samarahan, which was an Iban village.

Operational definition

For the purpose of this research, dietary diversity was operationally defined as dietary diversity score (DDS). Based on the 16 food groups, dietary diversity score was obtained by calculating the sum the number of food groups consumed over last 24 hours. It was taken into count when respondents ate any quantity of any food group at least once per day. Dietary diversity score was classified as low dietary diversity; when individual consumes less than or equal to 3 food groups, medium dietary diversity; when individual consumes 4 to 5 groups and high dietary diversity; when individual consumes 6 or more food groups (Kennedy, Ballard and Dop, 2010). The operational definition of Body Mass Index was based on the formula dividing weight (kg) with height (m) squared for adults aged 18 years old and above.

Statistical analysis

All data obtained was entered and analysed using Statistical Package for Social Sciences Program (SPSS) version 22.0. Simple descriptive analysis was done in presenting the socio-demographic and socio-economic characteristics of the respondents. Frequencies was generated, and interdependency of the variables was explored using Chi-square test, Independent T test and Pearson correlation test. Inferential statistical analysis was also conducted. A p value of less than 0.05 was taken as statistically significant.

Ethical consideration

A letter was sent to Food and Agriculture Organization (FAO) to obtain permission to use and adapt their questionnaire for this study. All participants who consented to the study was informed of theirs rights to refuse in participating or withdraw from the study throughout the duration of this research without giving any reason. All the information provided was treated with confidentiality and their names and address will not be disclosed.

RESULTS

The response rate was 72.7 % (101 respondents of total 139 population sample). 37 respondents were from Rumah Panjang Dingun and 64 respondents were from Rumah Panjang Banying.

Socio-demographic Profile

Table 1 shows the socio-demographic profile of the respondents. The mean (SD) age of respondents is 46.6. Female respondents account for 66.3% of all respondents. Majority of the respondents are married (73.3%) followed by single (15.8%) and widowed (10.9%). Almost all of the respondents are of Iban ethnicity (98%), with the remaining 2% ethnicities are Indian and Melanau. Most of them went through formal education (68.3%) followed by non-formal (31.7%). A clear majority of the respondents fall into the income category of <RM1500 (71.3%) while others earn >1500 (28.7%). 59.4% of the respondents were unemployed (including self-employed), and those with jobs form 40.6% of the respondents. More than half (56.4%) of them have a family size of more than 5 members, and the rest (43.6%) have 5 or less.

Table 1 Socio-demographic profie (N=101)

Variables	Frequency	%
Age (range :18-85)	46.6	
≤19	5	5.0
20-29	16	15.8
30-39	18	17.8
40-49	17	16.8
50-59	20	19.8
≥60	25	24.8
Gender		
Male	34	33.7
Female	67	66.3
Marital status		
Single	16	15.8
Married	74	73.3
Widowed	11	10.9
Ethnicity		
Iban	99	98.0
Non Iban[a]	2	2.0
Level of education		
No formal education	32	31.7
Formal education	69	68.3

Monthly family income		
<RM 1500	72	71.3
> RM 1500	29	28.7
Occupation		
Employed	41	40.6
Unemployed[b]	60	59.4
Family size		
≤5 members	44	43.6
>5 members	57	56.4

[a]*Consists of one Indian and one Melanau*
[b]*Includes self-employed*

Dietary Diversity Pattern of the Adults

Figure 1 shows the level of dietary diversity of the respondents. Majority of the respondents have high dietary diversity level (84.2%) followed by medium dietary diversity level (15.8%) and none of them have low dietary diversity level.

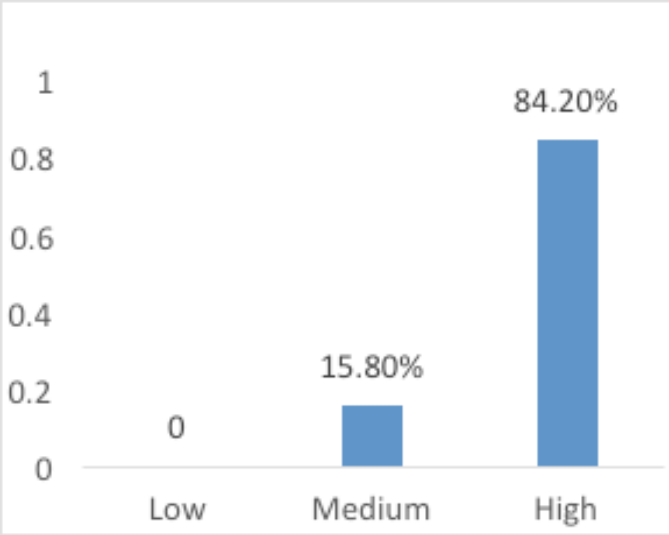

Figure 1 Proportion of Respondents by Level of dietary diversity

Figure 2 shows the percentage of food groups consumed by the respondents. The top five most consumed food groups are cereal (100%), spices, condiment and beverages (94.1%), sweets (90.1%), oils and fats (88.1%) and flesh meat (71.3%). The five least food consumed are vitamin A rich vegetables (16.8%), white roots and tubers (12.9%), legumes, nuts and seeds (10.9%), organ meat (7.9%) and vitamin A rich fruits (1%).

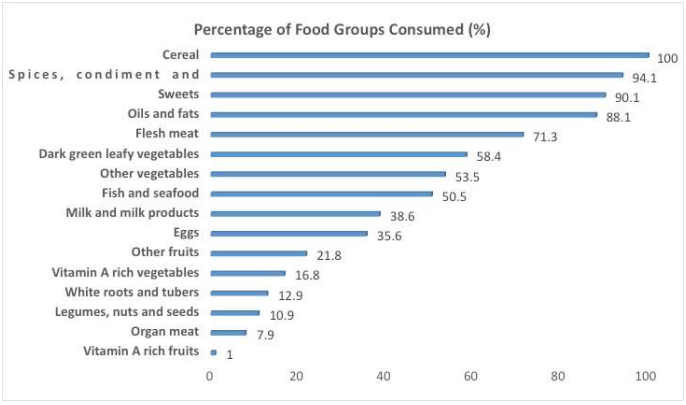

Figure 2 Food groups consumed by Respondents

Body Mass Index of the Respondents

Figure 3 shows the body mass index of the respondents. 58% of them are obese, 19% are normal, 17% are overweight and 6% are underweight.

Figure 3 Proportion of Respondents by Body mass index category

Association between Socio-demographic Profile and Dietary Diversity and Body Mass Index (BMI)

Table 2 shows the association between socio-demographic profile and dietary diversity level which was not statistically significant.

Table 2 Association between socio-demographic profile and dietary diversity level (N= 101)

Socio-demographic profile	Dietary diversity level			p-value
	Low	Medium	High	
	Mean (SD)	Mean (SD)	Mean (SD)	
Age (range :18-85)	-	52.1 (21.9)	45.5 (17.5)	0.192

Socio demographic profile	n	Dietary diversity level			p-value
		Low N (%)	Medium N (%)	High N (%)	
Gender					
Male	34		7 (6.9)	27 (26.7)	0.352
Female	67		9 (8.9)	58 (57.4)	
Marital status					
Single	16		2 (2.0)	14 (13.9)	0.142
Married	74		10 (9.9)	64 (63.4)	
Widowed	11		4 (4.0)	7 (6.9)	
Ethnicity					
Iban	99		16 (15.8)	83 (82.2)	0.825
Non-Iban	2		0 (0.0)	2 (2.0)	
Occupation					
Employed	41		6 (5.9)	35 (34.7)	0.396
Unemployed	60		10 (9.9)	50 (49.5)	
Education level					
Non-formal education	32		6 (5.9)	26 (25.7)	0.586
Formal education	69		10 (9.9)	59 (58.4)	
Family income					
< RM 1,500	72		10 (9.9)	62 (61.4)	0.397
> RM 1,500	29		6 (5.9)	23 (22.8)	
Family size					
≤ 5 members	44		7 (6.9)	37 (36.6)	0.987
> 5 members	57		9 (8.9)	48 (47.5)	

Table 3 shows the association between socio-demographic profile and body mass index of the respondents. Among the variables, only age and ethnicity have significant relationship with BMI with p-value of less than 0.05. There is a significant correlation between age and BMI with negligible coefficient (p-value=0.008, r=-0.261). There is significant difference between mean BMI of Iban (26.6) and non-Iban (37.2) respondents with the p-value of 0.009 but 98% of the respondents are Iban thus it is inappropriate to conclude the significant relationship between ethnicity and body mass index.

Table 3 Association between socio-demographic profile and body mass index (N=101)

Socio demographic profile	Mean (SD)	t-stats(df)	Mean difference (95% CI)	p-value
Age	-	-	-	0.008[a] r = -0.261
Gender				
Male	26.0 (4.58)	-0.935 (99)	-1.120 (-3.496, 1.256)	0.352
Female	27.1 (6.17)			
Marital status				
Single	25.7 (5.43)	1.239 (2)[b]	-	0.294[c]
Married	27.3 (5.84)			
Widowed	24.9 (4.68)			
Ethnicity				
Iban	26.6 (5.42)	-2.684 (99)	-10.572 (-18.389,-2.755)	0.009
Non-Iban[d]	37.2 (11.38)			
Occupation				
Employed	27.0 (4.83)	0.331 (99)	0.383 (-1.913, 2.679)	0.741
Unemployed	26.6 (6.24)			
Education level				
Non-formal	25.4 (5.50)	-1.701 (99)	-2.049 (-4.439, 0.341)	0.092
Formal	27.4 (5.69)			
Family income				
< RM 1,500	26.7 (5.62)	-0.126 (99)	-0.158 (-2.651, 2.334)	0.900
≥ RM 1,500	26.9 (5.95)			
Family size				
≤ 5 members	27.1 (6.46)	0.498 (99)	0.570 (-1.701, 2.842)	0.619
> 5 members	26.5 (5.05)			

[a] *P value of Correlation test*
[b] *F statistic (df)*
[c] *Analysis of variance test*
[d] *Consists of one Indian and one Melanau*

Table 4 shows the association between dietary diversity and body mass index, which is not statistically significant. The mean BMI for medium dietary diversity is 25.2 and mean BMI for high dietary diversity is 27.1.

Table 4 Association between Dietary Diversity and Body Mass Index (N=101)

Dietary Diversity	Mean BMI (SD)	t-stats (df)	Mean difference (95% CI)	p value[a]
Low	-	-	-	-
Medium	25.2 (4.09)	-1.23 (99)	-1.901 (-4.967, 1.165)	0.222
High	27.1 (5.91)	-1.58 (28)	-1.901 (-4.371, 0.569)	

[a]*The p-value for independent t test comparing mean BMI between medium and high dietary diversity.*

DISCUSSION

The purpose of this study was to determine the socio-demographic profile, dietary diversity pattern and the association between socio-demographic profile of occupants of the two selected longhouses with their dietary diversity level and body mass index.

This study found that most of the respondents had a high level of dietary diversity and none of them were having low dietary diversity. The likely reason behind this finding could be that most of the respondents had multiple choices of food sources. A research done by Wang, Liu, Fan and Tian (2017) reported that high dietary diversity was associated with increased number of nearby food facilities and higher food accessibility. Based on our observation, most of the respondents or their family members owned cars or other mode of transportation which may help them to have easier access to food sources. Besides that, there were also food stalls in the vicinity of the longhouses that were selling jungle produce and local food products. Furthermore, almost half of the respondents also obtained additional food products such as fruits and vegetables from their own gardens. The occasional hunting and exchange of food also added up to their varieties of food sources. Moreover, some respondents took their food outside the home due to factors such as working away from home, working mother and presence of several food varieties (Ali & Abdullah, 2012). All these factors enabled them to consume more food groups and this in turn, contribute to their high level of dietary diversity.

This study showed that cereal which consists of rice was the top food group consumed. This may be attributed to the fact that rice is mainly a staple food for Asian. International Rice Research Institute (2006) stated that rice, which falls in the cereal food group, is one of the most important staple foods for more than half of the world population. The other top food groups included in their diet were spices, condiments and beverages, sweets, oils and fats, and flesh meat because it is part of their culture to prepare their daily meals using these ingredients. On the other hand, the low percentage of vitamin A rich fruits such as mango and papaya taken by the respondents may be because it was difficult for them to obtain such food source. Rural Health Information Hub (2015) also reported that it was a challenge for the people in rural areas to access variety of food sources which are healthy and affordable due to rural areas are lacking in food retailers. Moreover, these fruits are not normally planted in the home gardens in this area.

This study found that there was no significant association between all the variables of the socio-demographic profile with the dietary diversity level. Firstly, it was found that there was no significant difference in mean age between the different levels of dietary diversity. However, the result does shows that respondents with increasing age had less dietary diversity which may reflect them having poorer appetite. This is supported by a study done by Pilgrim et al. (2015) which found that older people had poor appetite. Moreover, in another study done in Botswana by Clausen et al. (2005), it was reported that older adults consumed a diet low in variety. Secondly, there was no significant association between gender and dietary diversity level found in this study. This result is contrary to a study done in Malaysia which showed that women had a higher dietary diversity compared to men (Zainal et al. 2012). In another study done in Mali, it was found that woman was at higher risk of inadequate diets than men (Torheim et al. 2004). However, Haddad et al. (1996) reported that study on intra-household food allocation for gender bias has been thoroughly investigated, but based on a review of published literature, apart from in South-Asia, no clear gender preferences have been found. Thirdly, there was no association between dietary diversity level and educational level of the respondents. In a study done by Bezerra and Sichieri (2017), the researchers reported similar findings in which they found that there was no significant association between educational level and dietary diversity. However, a research done by Kahanya (2013) found that dietary diversity is strongly associated with the socio-economic status of the respondent households because people with higher education had a higher dietary diversity score and this could be due to people with a higher education

might have acquired essential information on appropriate feeding practices. Parents who had good knowledge on dietary diversity and child feeding practices were more likely to feed their children diversified foods and this was shown in a study done in southern Ethiopia which reported that a unit increase in maternal knowledge on international and young child feeding was associated with an increase in dietary diversity score (Dangura & Gebremedhin, 2017). Fourthly, there was no significant association between family income and dietary diversity level. This finding could be attributed to the fact that the villagers always share their food with their neighbors and that they planted a lot of different plants in their garden which led to a diverse diet. In contrast, a research done in Napalese by Senarath, Ago and Akram (2012) reported that children with diversified food sources were significantly associated with a higher household monthly income as their families were more likely be able to afford diversified foods as compared to children from a low household income. Other variables of socio-demographic profile such as marital status, ethnicity, family size, and occupation also showed no significant association with the dietary diversity level of the respondents.

Regarding socio-demographic profile and body mass index (BMI), it was found that there was a significant correlation between age and BMI, and our result is similar to the findings of a research done by Peter et al. (2014). In the study, the researchers found that BMI changes with age in which women were getting overweight from the age of 55 onwards and reaching obese at the age of 69 while men also followed the same trend except that the BMI decreased after the age of 80. There was a difference in mean BMI of Iban and non-Iban respondents. Azmi et al. (2009) reported that there are differences in BMI among the ethnics in Malaysia with Malays having the highest mean BMI followed by Indians, Chinese, Bumiputra Sabah and Bumiputra Sarawak. However, this study is not comparable with our finding because only 2% of our respondents were non-Iban. It was also found that there was no significant difference between mean BMI of male and female. This finding was consistent with the report of Center for Disease Control and Prevention (CDC) and World Health Organization (WHO) which stated that gender and BMI is not related (Halls, 2017). Contrarily, Ranasinghe et al. (2013) reported that there was a significant relationship between gender and BMI and concluded in their research that it is important to take gender when using BMI to predict obesity in a population. There was no significant difference between the marital status of the respondents and their BMI. However, according to Lipowicz, Gronkiewicz, and Malina (2002), they stated that married men and women had high risk to be overweight and obese than unmarried individuals, which is contradictory to our finding. Based on the occupation of the respondents, there was no significant difference found between occupations and body mass index in our study. This finding is similar to a study done by Singer et al. (2016) which found no association between employment status and overweight or obese status. There were also no significant association between BMI of the respondents with their education level, occupation, family income and family size.

This study also found no significant association between dietary diversity and body mass index (BMI), although those who had medium dietary diversity also had lower BMI compared to those who had high dietary diversity. The finding of adult's BMI increases as dietary diversity increases is also supported by the studies done in Brazil, Sri Lanka and China (Bezerra & Sichieri, 2011; Zhang et al., 2017)diets that offer a greater variety of energy-dense foods could increase food intake and body weight. The aim of this study was to explore association of diet diversity with obesity in Sri Lankan adults. Six hundred adults aged > 18 years were randomly selected by using multi-stage stratified sample. Dietary intake assessment was undertaken by a 24 hour dietary recall. Three dietary scores, Dietary Diversity Score (DDS. This may be due to the fact that dietary diversity does not include the choice of healthy or unhealthy food, eating pattern and frequency of eating which are essential in affecting the BMI (Anderson, Rafferty, Lyon-Callo, & Imes, 2011; Howarth, Huang, Roberts, Lin, & McCroy, 2006; Shay et al., 2012). The types of food groups consumed by the respondents were mostly high caloric food, and if not taken in balanced proportion will lead to high BMI. The reason of having insignificant result from this study is likely due to small number of respondents, while studies done previously had respondents of more than 600. Interestingly, study done among the indigenous people in Pahang, Malaysia with the respondents of only 57 people also shows no significant correlation between the dietary diversity and BMI as well (Haemamalar, Zalilah, & Neng Azhanie, 2010)comprising 29 men and 28 women,participated in the study. Dietary diversity was assessed using food frequency questionnaire with 37 food groups. Weight, height and waist circumference were measured using standard instruments. The mean age for men and women was 39.9 \u00b1 17.1 years and 33.7 \u00b1 16.1 years, respectively. Most (89.5%.

This study had several limitations. Firstly, the twenty-four-hour recall was basically a retrospective method of diet assessment which may not represent the long-term dietary habits of the occupants. There were recall bias especially among the old age adults. The sample size was also small because some of the longhouse occupants were not staying in longhouse, they stayed in the city and came back only during festive season. Interviewer bias may happen because respondents tend to give positive responses as in avoiding telling certain food or drink that are unhealthy to please the interviewer since all interviewers are medical students which may contribute to the bias.

CONCLUSION

The study showed that majority of the respondents in these longhouses had a high level of dietary diversity, while none of them were having low dietary diversity. Based on the data analysis, top three popular food groups among the respondents were cereal groups, spices, condiment and beverages groups, oils and fats and groups, while the least popular food groups among the respondents were vitamin A rich fruits. The data analysis also showed that majority of the respondent's body mass index (BMI) was obese. Furthermore, the only significant correlation was between the age and body mass index (BMI). This study also showed that the BMI were not influenced by the level of the dietary diversity of the respondents. Hence, further research can be carried out to include other longhouses of the same area to attain a larger sample size.

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Group member: Asri Rosdy, R., Fatin Nabila, M. N., Jackie Anderson, J. A., Jennifer Vennylyn, D., Karen Esther Odo, Kimberly Natallie Umang, R., Luqman, Z. F., Mark Fitchell, J., Maurice Mojini, J., Mohamad Nazri, S., Nina Pramila, Nur Farzana, H. T., Nurul Syafiqah, M. S., Rachellynne Christie, J., Syafiqah, S., Wan Nur Aqilahanis, W. R., Alexius, A., Betty Tang, J. J., Doreen Ng, C. Y., Esther Lam, Z. Y., Hasnatul Mardhiaah, M. R., Kaven Tan, K. W., Loi, W. W., Mazwanee Arena, M. R., Ong, S. T., Ooi, P. Y., Santha Letchumi, P., Yoong, C. C.

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Corresponding author

Professor Dr Mohamad Taha Arif
Department of Community Medicine and Public Health
Faculty of Medicine and Health Sciences
Universiti Malaysia Sarawak (UNIMAS)
Email: amtaha@unimas.my

Knowledge, Attitude and Practice of Household Food Wastages among Villagers in Sekuau, Sibu, Sarawak

MD MIZANUR RAHMAN, ZULKIFLI JANTAN, SATYA VIKNESRAJ, R. AND RESEARCH GROUP.

Department of Community Medicine and Public Health
Faculty of Medicine and Health Sciences
Universiti Malaysia Sarawak

ABSTRACT

Introduction: Food is a necessity for life. Food produced have often exceeded the amount normally required by the society. Most of the excess food are wasted instead of given to those who are in need. **Objectives**: This study was aimed to assess the current knowledge, attitude, and practice of household food wastage among the respondents in Rumah Panjang Henry Empong, Meramat, and Rickie Andrewson in Sekuau, Sibu. **Methods**: This was a cross-sectional study conducted among the targeted homemakers in selected three longhouses in Sibu, Sarawak. The data was collected using interviewer-administered questionnaire, which consisted of four parts. The collected data were analysed by using IBM SPSS version 23. **Results**: A total of 50 respondents have participated in this study with a mean age of 51.5 years. Three-fourth (74%) of the respondents had an average knowledge on household food wastage, while 16% and 10% of the respondents had a poor and good level of knowledge respectively. Next, 72% of the respondents had an average preventive attitude towards household food wastage, while 12% and 16% had poor and good preventive attitude respectively. A composite mean score of the preventive practice of household food wastage was calculated with the highest mean score in before meal preparation [4.31(0.600)] followed by after meal preparation [3.40(0.600)] and lastly during meal preparation [2.49(0.9)]. An analysis found that no statistically significant association was found between food wastage and age, level of education, marital status, family size, number of family members aged less than 18 years, income and knowledge and preventive attitude towards food wastage ($p>0.05$). However, a significant correlation between food wastage and the number of family members aged below 18 years ($p<0.05$) was found. **Conclusion**: About three-fourths of the respondents have an average knowledge and preventive attitude towards household food wastage. Children below 18 years old tend to have more food wastage compared to other age groups. **Recommendation**: To change household food wastage behaviour, efforts should be directed towards the villagers with skills and tools to deal with their food-related activities and to consider environmental and economic impacts of food waste.

Key words: *Knowledge, Attitude, Practice, Food wastage, Sarawak*

INTRODUCTION

Food is a very important aspect of our life as it is a part of our necessity to survive. Society has been successfully able to produce food more than the daily requirement. However, most of the excess food was wasted (Hic, Pradhan, Rybski & Kropp, 2016). The definition for food waste is a wholesome edible material which is intended for human consumption but instead discarded, lost, degraded, or intentionally fed to animals (Stuart, 2009). The highest number of food wastage occurs at consumer level which shows significant percentages and rates (Kantor, Lipton, Manchester & Oliveira, 1997; Griffin, Sobal & Lyson, 2009). Food waste occurs daily in every household but to some people, it can be a delicate topic for discussion because some individual view it as part of their normal daily routine (FAO, 2011). In Malaysia, household food wastage is the dominant component of recyclable municipal solid waste which accounted for 40% to 64% from the year 1975 up to 2005 (Abdul-Talib, 2004). In 2014, Malaysia with a population of more than 30 million produced up to 8,000 tons of household food waste in a day (The Sun Daily, 2014) which is a significant increase from 930 tons of food waste in a day in 2013 (The Star, 2015). The reasons for a sudden increase in food waste is due to change in eating habits as living standards have improved through the year where people can afford food and choose a variety of choice according to their needs (Abdul, 2010). Apart from that, rapid urbanization and increase in

populations also contribute to this matter (Zamali, Mohd & Abu, 2009). Increase in household food wastage causes insecurities about food among poor people. This issue can also affect the economic development, environmental care, food standard and safety of the country. Therefore, awareness towards household food wastage must be increased among the people. Ministry of Housing and Local Government of Malaysia in cooperation with Japan government's Ministry of the Environment, suggested The National Strategic Plan for Food Waste Management 3 in Malaysia (NSPFWMM), with the purpose to increase the awareness on food wastage (Lim et al., 2016).

Data on the relationship between socio-demographic characteristics and household food wastage is currently lacking in Malaysia. Therefore, this study is important to find the link between knowledge, attitude and practices to the household food wastage. The findings of this research would also be used to conduct awareness and education intervention program to improve the household food wastage management to reduce household food wastage. Hence, the objective of this study was to assess the current knowledge, attitude and practice of household food wastage and their relationship to the socio-demographic characteristics among the respondents in Rumah Panjang Henry Empong, Rumah Panjang Meramat and Rumah Panjang Rickie Andrewson, Sekuau, Sibu.

METHODOLOGY

Study settings and population

A cross-sectional study was designed to determine the knowledge, attitude and practice of household food wastage among occupants of Henry Empong, Meramat and Rickie Longhouses in Sekuau, Sibu, Sarawak. The longhouses have 300 residents and 23 households, 180 residents and 16 households and 200 residents and 30 households respectively. Nearly 100% of the respondents from these longhouses were of Iban race while very few were Melanau. In each household, one woman aged 18 years and above preferably a housewife that cooks in the household was selected randomly. A total of 50 respondents, out of 69 households were managed to interview. The respondents were interviewed individually without other family members around.

Data collection instruments

The data were collected by face-to-face interview using interviewer-administered questionnaire. The questionnaire was in Bahasa Melayu and it consisted of four parts. Part 1 consisted of 7 questions inquiring socio-demographic background of the respondents. Part 2 consisted of 14 questions assessing the level of knowledge on food wastage activities, the effects and the prevention methods. Part 3 consisted of 14 questions regarding attitude on food wastage. Respondents were assessed on their attitude and understanding on food wasting, and their encouragement to prevent it and Part 4 consisted of 18 questions assessing the practice of food wastage by the respondents and their household members. This part was further sub-divided into two parts.

Data collection procedure

Data were collected during the weekends when the respondents were available. A structured and pretested questionnaire were used to interview the residents except for those who refused to participate in this study. Data collection was conducted by interviewing the respondents after obtaining consent from them. Verbal translations from Bahasa Melayu to Bahasa Iban were made whenever necessary for better communication with the respondents. The questionnaire interview was completed in 20 to 30 minutes.

Pre-testing

A pre-test of the questionnaire was done in Sebastian longhouse, a non-sample area. The objective of this pre-test was to assess the quality of the questions in terms of how well it could be understood by the respondents, logically sequenced and duration of time to conduct a single interview. Completion of the data was checked instantly after the interview to find any missing information and was corrected immediately.

Data entry and analysis

IBM SPSS version 23 was used for data entry and analysis. Tables and graphs were used to better visualise the analysis. The descriptive statistics was calculated. For inferential statistics, the summative scores obtained from the measurement of knowledge, attitude and practice of household food wastage components were correlated using Pearson Moment Correlation. The score of knowledge, attitude and practice was classified into dichotomous or polychotomous qualitative variables. Pearson's chi-squared test was used to determine the relationship between knowledge, attitude and practice with socio-demographic characteristics. A p value of less than 0.05 was considered as statistically significant.

Ethical Consideration

The Medical Research Ethical Committee of UNIMAS approves this research. All participants who consented to the study have been informed of their rights to refuse in participating or withdraw from the study. The participation is open to all the suitable respondents who are willing to take part in the research. Any violence or coercion has not been used as an approaching method. Participants were guaranteed anonymity and all information provided was treated with confidentiality. Before the interview, written informed consent was taken.

RESULTS

Socio-demographic characteristics

Table 1 illustrates the socio-demographic characteristics of the respondents. A total of 50 respondents have participated in this study. The mean (SD) age of the respondents was 51.5 (14.0) years with minimum age 25 and maximum 80 years. Most of the respondents were Iban (98%) and only a few were Melanau (2%). About two-fifths (38%) had no formal education followed by 30% had the secondary level of schooling and 26% had the primary level of schooling. About three-fourths (74%) of the respondents were married and rest were either single, divorced, separated or widows. The median family size was six with minimum two and maximum 13 members in a family. The median number of a family member under 18 years was two and maximum 13. The median monthly household income was MYR 1250.50. One-third (34%) of the respondents had income more than MYR 2000 and 22% had income in the range of MYR 500-1000. However, one-fifth of them had income less than MYR 500.

Knowledge on food wastage

The respondent's knowledge on household food wastage was assessed by asking 13 items questions. These 13 item questions were summed up and then it was further categorized into poor, average and good based on one standard deviation around mean, that is a score below mean minus one SD was considered as poor and score above Mean plus one SD as good knowledge. Out of 50 respondents, 74% have an average knowledge on household food wastage, while 16% and 10% of the respondents have poor and good level of knowledge respectively (Figure 1).

Table 1 Socio-demographic characteristics of the respondents

Characteristics	n	%	Statistics
Age in years			
<40	11	22.0	Mean(SD)= 51.5(14.0) yrs.
40-49	10	20.0	Median=52 yrs.
50-59	10	20.0	Min=25
60-69	15	30.0	Max=80
≥70	4	8.0	
Ethnicity			
Iban	49	98.0	
Others	1	2.0	
Level of education			
No formal education	19	38.0	
Primary school	13	26.0	
Secondary / High school	15	30.0	
University	3	6.0	
Marital status			
Married	37	74.0	
Others	13	26.0	
Family size			
<6	21	42.0	Mean(SD)= 5.9(2.5)
≥6	29	58.0	Median=6, min= 2, Max=13
Number of members <18 years			
≤2	27	54.0	Mean(SD)= 1.8(1.6)
≥3	23	46.0	Median=2, min= 0, Max=7
Monthly household income (MYR)			
<500	10	20.0	Mean(SD)= 1300.5 (784.09)
501-1000	11	22.0	Median=1250.5,
1001-1500	10	20.0	
1501-2000	2	4.0	
>2000	17	34.0	

Attitude towards household food wastage

To assess the attitude towards household food wastage, a total of 12 items of questions were asked to the respondents. Each item question uses Likert's scale from 'strongly disagreed to strongly agree'. A composite mean score of attitude was calculated using all item-questions. Then it was classified into poor, average and good based on one standard deviation around mean. Three-fourths (72%) of the respondents had an average preventive attitude towards household food wastage, while 12% and 16% had poor and good preventive attitude respectively (Figure 2).

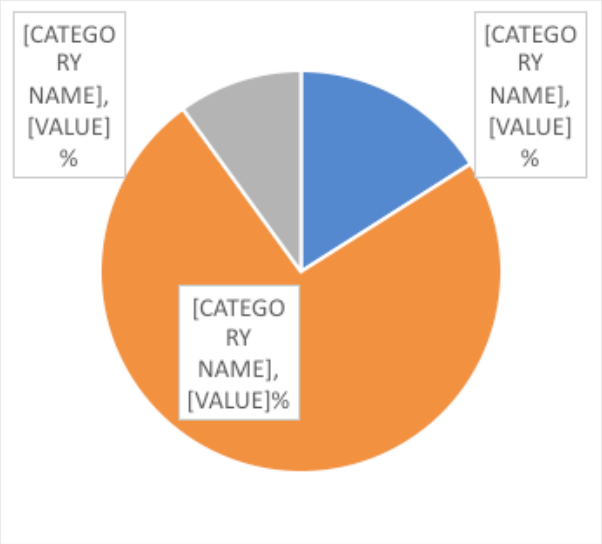

Figure 1: Knowledge on food wastage

Preventive practice of household food wastage

A total of 11 item questions were asked to assess the preventive practice of household food wastage. The items questions were classified into preventive practice before food preparation (three items), during food preparation (two items) and after food preparation (six items). A composite mean score of preventive practice was calculated and presented in bar diagram (Figure 2). The highest mean score was before meal preparation [4.31(0.600)] followed by after meal preparation [3.40 (0.600)]. However, the lowest mean score was during meal preparation [2.49 (0.900)].

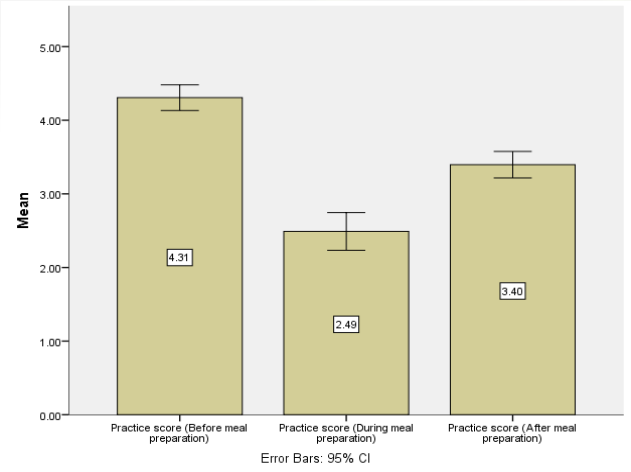

Figure 2: Preventive attitude towards food wastage

Household food wastage

One-third of the household had the history of food wastage in lunch and dinner in last week. However, one-fourth of the respondents reported that they had discarded uncooked food. One-fifth (20%) of the respondents had the history of food wastage in breakfast. It was found that 16% to 32% of respondents had the history of 1/4 of total food wastage in the last week (Table 2).

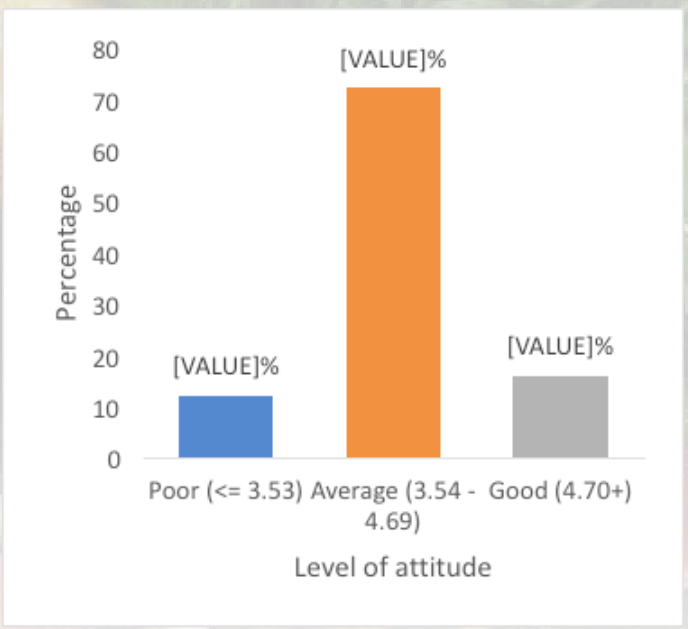

Figure 3: Mean preventive practice score of food wastage

Table 2: Percentage distribution of food wastage in the last week

Timing	Wastage of food (%)				
	None	1/4 of total	1/2 of total	3/4 of total	Whole
Uncooked food	76.0	20.0	4.0	0.0	0.0
Breakfast (served)	80.0	16.0	2.0	1.0	0.0
Lunch (served)	64.0	30.0	4.0	2.0	0.0
Dinner (served)	64.0	32.0	4.0	0.0	0.0

Relationship between food wastage and socio-demographic profile

To find the factors associated with food wastage, Pearson chi-square test of independence was done in which the dependent variable was cooked food wastage and independent variables were age, level of education, marital status, family size, number of family members aged less than 18 years, monthly household income and knowledge on food wastage and preventive attitude towards food wastage. Analysis revealed that no statistically significant association was found between food wastage and selected variables ($p>0.05$). However, data showed that the percentage of food wastage was higher among the respondents aged 50 years and above (58.6%), no formal education (63.2%), other than currently marital status (61.5%), family size more than 6 (62.1%), number of family members aged below 18 years three and above (65.2%), low income (61.9%). It was also noted that the food wastage was higher among the respondents having poor knowledge on food wastage.

Table 3 Relationship between food wastage and selected variables

Variables	n	Wastage of cooked food (%)		p value
		No	Yes	
Age in years				
<50	21	42.9	57.1	0.917[a]
≥50	29	41.4	58.6	
Level of education				
No formal education	19	36.8	63.2	0.563[a]
Formal education	31	45.2	54.8	
Marital status				
Married	37	43.2	56.8	0.764[a]
Others	13	38.5	61.5	
Family size				
<6	21	47.6	52.4	0.493[a]
≥6	29	37.9	62.1	
Number of members <18 years				
≤2	27	48.1	51.9	0.340[a]
≥3	23	34.8	65.2	
Monthly household income				
Up to 1000	21	38.1	61.9	0.634[a]
>1000	29	44.8	55.2	
Knowledge				
Poor	8	0.0	100.0	NA
Average	37	48.6	51.4	
Good	5	60.0	40.0	
Attitude				
Poor (≤3.41)	6	16.7	83.3	NA
Average (3.42 - 4.72)	36	55.6	44.4	
Good (≥4.73)	8	0.0	100.0	

[a]p value reached from chi-square test
NA not applicable

Correlation matrix of food wastage and socio-demographic profile

A total of eight variables were analysed to correlate with food wastage. Each variable correlate using non-parametric Spearman's rho correlation. No variables were significantly correlated with food wastages ($p>0.05$) except for the number of family members aged below 18 years ($p<0.05$).

Table 4: Correlation matrix of food wastage and selected variables

	1	2	3	4	5	6	7	8
1. Wastage of cooked food	-							
2. Age in years	0.006	-						
3. Level of education	0.010	-.639**	-					
4. Family size	0.195	-0.251	0.167	-				
5. No of members less than 18 yrs	.289*	-0.181	0.235	.669**	-			
6. Monthly Income	-0.067	-0.115	0.152	0.258	0.082	-		
7. Knowledge on food wastage	-0.258	-.355*	.344*	0.190	0.053	0.029	-	
8. Attitude towards food wastage	-0.004	-0.276	0.150	0.048	-0.131	0.062	.435**	-

***Correlation is significant at the 0.05 level (2-tailed).* **Correlation is significant at the 0.01 level (2-tailed).*

DISCUSSION

Knowledge about food wastage is vital as it reflects how much the consumers are aware of the effects of food wastage and the findings can be used to design intervention programmes against food wastage. From the results, around 85% of the respondents had an average or good level of knowledge about household food wastage. This showed that majority of the respondents had basic awareness about the issue of household food wastage. A high proportion, 82% of respondents are aware that food wastage is a problem. The result is concurrent with a study done by Marangon, Tempesta, Troiano and Vecchiato (2014) which reported that 89% of the respondents from North Eastern Italy took food wastage issue as a serious matter. Moreover, results showed that two out of three of the respondents are aware that food waste can harm the environment. This could be due to the attention is given to pollution by the press media nowadays (Jarjusey & Chamhuri, 2017).

Regarding knowledge on food storage, the results showed that more than 90% of respondents knew the proper way to store their food to prevent it being spoilt and prevent food wastage. The result is like a research done in the United Kingdom that more than 80% of respondents were aware of the proper way to store food to avoid food poisoning and food wastage (WRAP, 2017). By comparing to the other items in our research, relatively fewer respondents knew the way to read the label on food packaging (70%), as well as follow the recommended storage information on packaged goods (48%). This result could be related to low education level in Sekuau as 19 out of 50 respondents did not receive the formal education therefore they had difficulty in reading the label and the storage information on food. In the present study, over half of the respondents (58%) did not know that food waste can be used as fertilisers. There is an opportunity to educate people on the advantages of composting where it minimizes damage to the environment and produces economically valuable products from the bio-waste.

Majority of the respondents (88%) had an average or poor attitude regarding household food wastage. This result is similar to the trend showing the poor attitude among Australian consumers towards an issue of household food wastage (Hamilton, Dennis & Baker, 2005). From the results, 80% of the respondents felt guilty upon throwing food away. Similar findings from Qi and Roe (2016) who found that 77% of the United States citizens agreed that they felt guilty about throwing away food. Besides, almost all (98%) of the respondents agreed that throwing food away is a waste of money, where 72% of the respondents also agreed that wasting more expensive food caused more guiltiness to them than wasting cheap food. It could be inferred that food wastage problem in the studied location could be related to the financial issue as the median household income among the respondents was only RM1250.50, which is far lower than the average household income (RM5228) in Malaysia (Department of Statistics Malaysia, 2016). Furthermore, around 85% of respondents from present study agreed that buying less food and controlled shopping able to help them to reduce food wastage. This finding is like Gjerris and Gaiani (2013) where they identified greediness in buying food as factors contributing to food wastage. Based on the findings, the mean preventive practice score of household food wastage was the highest before meal preparation [4.31(0.6)]. This finding indicated that the respondents waste less food before meal preparation, which is contrary to findings of Siti Wahidah (2017) where more food was wasted during pre-meal preparation. This could be due to the findings that 88% of the respondents in the present study often or always used up all the prepared ingredients for cooking.

Even though no statistically significant association was found, 65.2% of the family having three or more family members aged below 18 years old are involved in household food wastage. Also, using non-parametric Spearman's rho correlation test, number of members less than 18 years old ($p<0.05$) is positively and significantly correlated with food wastage (0.669). This showed that most of the food wastages was done by the younger kids. This is like Lyndhurst's findings (2007) as younger generation waste more than the older generation. WRAP (2007) also supported that food wastage is commonly seen in the younger respondents, where almost 64.6% of wasted food contributed by families with children in the household. Other than that, the present study showed that 62.1% of household with more members (six or more) wasted food. This finding is similar to other studies as the household with more members waste more compared to the smaller household (Osner, 1982; Lyndhurst, 2007; WRAP, 2009). Food wastage also related to household income. In this study, it was found that about 62% of the household having less income (up to RM 1000) are involved in food wastage, which is like similar to WRAP's findings (2010) where lower income group will waste more food due to an ineffective practice of shopping planning. It was also noted that the food wastage was higher among the respondents who were less educated (63.2%) and having poor knowledge on food wastage (100.0%). This is due to poor knowledge regarding shopping methods, cooking methods and storage methods which can contribute to food wastage (Gjerris & Gaiani, 2013).

LIMITATIONS

Most of the participants are older so some questions can affect the accuracy of their recall. Other than that, there is also a communication problem where the team member has limited ability to speak in Iban languages and this may result in discrepancy between communication which results in some incorrect data collection. The results are limited to study target populations and do not represent the whole populations from different regions.

CONCLUSION AND RECOMMENDATION

Based on the study, the analysis revealed that no statistically significant association was found between food wastage and selected variables. In addition, there are no variables significantly correlate with food wastages except for the number of family members aged below 18 years. This showed that most of the food wastages happened through younger children. In the future, this study should be extended by to cover more areas to get higher sample size.

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Corresponding author

Professor Dr Md Mizanur Rahman
Department of Community Medicine and Public Health,
Faculty of Medicine and Health Sciences,
Universiti Malaysia Sarawak, Malaysia
Email: rmmizanur@unimas.my

Alcohol Use Disorder and Depressive Symptoms: A hypothesis-generating study among Iban communities in Sibu, Sarawak

ANDREW KIYU, ROSALIA SAIMON, HILLMAN, H., AND GROUP
Department of Community Medicine and Public Health
Faculty of Medicine and Health Sciences
Universiti Malaysia Sarawak

ABSTRACT

Introduction: Evidence shows that alcohol users are at risk for mental illness such as depression, anxiety and stress. Alcohol consumption is common among the Ibans in Sarawak. **Objective:** To generate hypothesis on the relationship between alcohol use disorders (AUD) and depressive symptoms among the rural Iban community in Sibu. **Methods:** Forty respondents from two Iban longhouses participated in this pilot study conducted in December 2017. AUDIT was used for alcohol screening, while DASS-21 was used to screen depression, anxiety and stress symptoms. The correlation between variables was tested using a Spearman correlation test. **Results:** The prevalence of current alcohol use was 87.5%, and among them 80% were categorized as AUD. Among the AUDs, 67.9% were low risk, 28.6% were hazardous and 3.6% were high risk drinkers. The mean age of first time taking alcohol was 22.43 years (SD=8.12). In terms of the alcohol intoxication, 32.1% of the respondents were drunken once in a month, followed by 21.4% were drunken more than once a month. Beer was the most common alcoholic drink consumed, followed by *tuak, cap apek* and *cap langkau*. Family gathering appeared to be the most important factor for alcohol consumption. The prevalence for depression, anxiety, and stress was 20%, 37.5% and 22.5%, respectively. Among respondents with depressive symptoms, 7.5% has mild and moderate levels of depression and 2.5% reported severe and extremely depressive symptoms. Our results suggest there was some evidence of positive correlation between AUD and depression (r_s=0.11), anxiety (r_s=0.09), and stress (r_s=0.17), but missed the statistical significance. Depression, anxiety and stress were significantly correlated with each other. Age was a significant factor and positively correlated with depression (r_s = 0.39, $p < 0.05$), anxiety (r_s = 0.41, $p < 0.01$), and stress (r_s = 0.32, $p < 0.05$). As the age increases, the likelihood of having depression, anxiety and stress increase. **Conclusion:** This study found some evidence of positive relationship between AUD, depressive, anxiety, stress symptoms, and age. Further confirmatory study in large populations was needed to confirm the correlations

Keywords: Alcohol use disorder, Depression, Iban, Sibu

INTRODUCTION

The World Health Organization (WHO) estimated that there were around 2 billion people worldwide consuming alcoholic beverages and 76.3 million had alcohol use disorder (WHO, 2011). About 3.3 million deaths worldwide were due to harmful alcohol consumption (WHO, 2014). In Malaysia, the prevalence of alcohol use disorder in 13 years old and above is around 11.6%, with 1.7% of alcohol-related death (WHO, 2015). Among these, 23.6% practised risky drinking. The prevalence of risky drinking was around 2.7-fold higher among Bumiputera Sabah and Sarawak (Mutalip et al., 2013). Problematic alcohol consumption that becomes severe is given the medical diagnosis of "alcohol use disorder" or AUD. AUD is characterized by compulsive alcohol use, a negative emotional state when not using and loss of control over alcohol intake (WHO, 2011). Alcohol dependence is often associated with a wide range of problems relating to mental and physical health, either directly such as alcohol-related injuries, pancreatitis and fetal alcohol syndrome; or through contributions to other health conditions such as cancers of the gastrointestinal tract, liver, colorectal region and breast (Felix et al., 2016); and increased risk of cardiovascular conditions such as cardiomyopathy, atrial fibrillation and systemic hypertension (Arthur and Nicole, 2016). Alcohol use causes psychiatric morbidity including

depression, anxiety and suicide (WHO, 2011). Alcohol in large quantities is associated with high rates of depression as alcohol has mood depressant effects and can worsen depressed mood, thus may be associated with increased risk of suicide (Weinstein, 2011). The course of alcohol dependence in people with alcohol-induced depression is more severe when compared to those with depression independent of alcohol dependence. A depression-like set of symptoms may emerge during or after alcohol withdrawal (Weinstein, 2011). Various possible relationships between alcoholism and depression have been postulated. Among others, Stewart et al. (2016) have proposed three primary models that could explain the alcohol use-depression comorbidity. According to them, the first two models have direct causation between each other in which AUD causes depression and vice versa; while the third model proposes that there is presence of common variables that could be linked to both development of alcohol and depression without direct causation between the latter two.

In support of Stewart's model, Kenneth (2016) stated there are two primary reasons alcohol misuse can lead to depression. The first is psychosocial. Individuals with alcoholic problems tend to have deterioration in their interpersonal relationships and job performances. As such, these stressful and undesirable situations cause negative emotions to build up, leading to a major depressive disorder. The second is biological. Alcohol is a natural depressant which lowers the function of neurotransmitters in the central nervous system. Long term alcohol consumption causes permanent damage to the brain. On the other hand, depression may precede AUD. Many depressed individuals turn to alcohol or drugs in an attempt to self-medicate, but end up exacerbating the depression (Kenneth, 2016). High rates of comorbidity among alcohol use, anxiety and depression as well as significant associations between anxiety and depression and drinking have been well-documented in clinical samples (Kenneth, 2016), but still lacking in community samples.

The Iban community is the largest ethnic group in Sarawak and usually involved in farming to meet the needs of the household and also to earn extra income (Lyndon et al., 2011). Majority of them, especially in the lowlands, are living mostly in longhouses along the main rivers and their tributaries. Yea (2002) stated that there are about 4,500 longhouses in Sarawak. A single longhouse block may house up to 100 families, which comprise of owned apartments joined by a common verandah. Although longhouses nowadays are deemed as a threatened typology, the Iban's longhouses are still commonly constructed especially in the rural areas (Yea, 2002). Iban communities are known to have a traditional drinking culture which involves rice wine known as *tuak* and rice spirits also known as *cap langkau* (Lyndon et al., 2011). Alcohol is sometimes used as an important ritual element of festivities and social gatherings, such as Gawai (paddy harvesting) and other occasion e.g. wedding ceremonies, Christmas and New Year's Eve. Alcohol consumption is inherited from their ancestors and drinking has since become a norm (Lyndon et al., 2011). A glass of *tuak* is usually offered at longhouses to welcome visitors. Alcohol is readily available and an essential part of the Iban cultural identity. Drinking alcohol is viewed positively in the Iban community especially for men.

Guided by Stewart et al. model, this pilot study aimed to examine the patterns of alcohol consumption and its relationship with depressive symptoms among the rural Iban community samples in Sibu. It was hypothesized that AUD would have a positive correlation with depression, anxiety and stress.

METHODOLOGY

Study Area and Study design

The research was conducted in two Iban longhouses located about 60 km away from Sibu town. The two longhouses consist of 48 households with estimated total populations of 120. This study was a cross-sectional study designed for description and analysis of alcohol use disorder and depressive symptoms among the Iban community.

Sample size and sampling method

Purposive sampling method was used in the study. In each household, respondents of age 13 years old and above, who consented and were able to communicate were interviewed at their longhouses. Patients with Alzheimer, terminally ill or alcohol intoxicated were excluded. A total of 40 respondents participated.

Instruments

AUDIT, a 10-item screening tool developed by the WHO was used to assess: (1) hazardous alcohol use that evaluate the frequency of drinking, typical quantity and frequency of heavy drinking, (2) dependence symptoms by determining impaired control over drinking, increased salience of drinking and morning drinking, and (3) harmful alcohol use that assess for guilt after drinking, blackouts, alcohol-related injuries and other concerned about drinking (Babor et al., 2001). A score of 8 or more is considered to indicate hazardous or harmful alcohol use. The AUDIT has been validated across genders and in a wide range of racial / ethnic groups and is well suited for use in community settings.

DASS-21 was used to measure the severity of behavioural and emotional state of depression, anxiety and stress (Lovibond & Lovibond, 1995). Based on 21 items, depression, anxiety, and stress was calculated with 7 items in each of the domain. The sum of the scores was calculated, which is equal to the total score of each domain multiplied by two. The Depression subscale evaluate dysphoria, hopelessness, devaluation of life, self-

deprecation, and lack of interest/involvement, anhedonia and inertia. The Anxiety subscale measure autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The Stress subscale assess the levels of chronic non-specific arousal; difficulty relaxing, nervous arousal, and being easily upset, agitated, irritable, over-reactive and impatient. In this scale, a 4-point severity/frequency scales is used to rate the degree to which they experience depression, anxiety and stress over the past week. Eight knowledge items on drinking safe limit and alcohol consequences on health were added to test the respondents' knowledge. All items were translated into Bahasa Malaysia and Iban, and pilot tested prior to data collection.

Data collection procedure

A face-to-face interview was conducted at longhouses over one weekend. For AUDIT, respondents were provided with a codebook that illustrated one standard drink of alcoholic beverage that contain 10 g of pure alcohol. Five classifications were used, namely low risk (1-7), dangerous (8-15), harmful (16-19) and alcohol dependence (20-40). Similarly, five classifications were used in DASS, which were normal, mild, moderate, severe and extremely severe. Respondents found to have severe depression were advised to seek treatment at a nearby clinic.

Data Analysis

All data obtained were entered and analysed using Statistical Package for Social Sciences Program (SPSS) version 22.0. Simple descriptive analysis was used for presenting the sociodemographic and socioeconomic characteristics of the respondents. Spearman correlation was used to test the monotonic relationship between two continuous variables, AUD and depressive symptoms.

Ethical consideration

This research was approved by the Medical Research Ethics Committee of UNIMAS. All participants who consented to the study were informed of their rights to refuse in participating or withdraw from the study. All information provided is confidential; names and addresses will not be disclosed.

RESULTS

Sociodemographic characteristics

Table 1 shows the socio-demographic profile of the respondents. The mean age of respondents was 50.5 (SD=18.9). About 95% of respondents were adults and the remaining were adolescents. The median monthly household income was MYR 1000 (Q1 = MYR 850, Q3 = MYR 1500). Majority of the respondents were married (87.5%). More than half (52.5%) had education level up to secondary school level and higher whereas the rest of them had education level up to primary school.

Pattern of Alcohol Consumption

Table 2 shows the pattern of alcohol consumption of the respondents. Out of 40 respondents, 87.5% of them consumed alcohol while 12.5% never consume alcohol. Out of 35 who consumed alcohol, 80.0% of them had AUD. The mean age of first time taking alcohol was 22.4 years. Out of 35 respondents, 28 (80.0%) respondents that has a history of alcohol consumption in the last 12 months. In terms of alcohol intoxication, 32.1% of the respondents were drunken once in a month followed by 21.4% who were drunken more than once a month. Family gathering appeared to be the most important factor for alcohol consumption, followed by family and peer influence (46.4%), and coping with problems (25%). Beer was the most common alcoholic drink consumed by the respondents which constituted about 89.3%, followed by locally brewed alcohol (*tuak, cap apek* and *cap langkau* - 75%, 42.9% and 25.0% respectively), while whiskey and brandy were the least commonly consumed. Among the 40 respondents, 55.0% of them had good knowledge on alcohol consequences on health while the remaining 45.0% were not.

Table 1: Sociodemographic characteristics of the respondents (N=40)

Characteristics	Frequency	%
Age in years	Mean (SD) = 50.5 (18.9) years	
<18	2	5.0
19-55	19	47.5
>56	19	47.5
Gender		
Male	25	62.5
Female	15	37.5
Marital status		
Unmarried	5	12.5
Married	35	87.5
Level of education		
Up to primary	19	47.5
Secondary higher	21	52.5
Monthly household income (MYR) (n=20)		
<1000	8	40.0
>1000	12	60.0
Median = MYR 1000; Q1 = MYR 850, Q3 =zMYR 1500		

Q1= Quartile 1; Q3 = Quartile 3

Prevalence of Alcohol Use Disorder (AUD)

Based on the AUDIT-10 items score, the AUD was classified into low risk (0-7), hazardous (8-15) and high risk (16-19) and score of 20 or more indicates alcohol dependent. The prevalence of current alcohol use was 87.5%, and among them 80% were categorized as AUD. Among the AUDs, 67.9% were low risk, 28.6% were hazardous and 3.6% were high risk drinkers (Refer Table 2).

Table 2: Pattern of alcohol consumption, knowledge and alcohol use disorder

	Freq	%
History of alcohol consumption (n=40)		
Yes	35	87.5
No	5	12.5
Age at starting alcohol consumption (n=35)		
<20	14	40.0
20+	21	60.0
Mean(SD) = 22.4(8.1); Min =12, Max = 43 yrs		
Alcohol consumption past 12 months (n=35)		
Yes	28	80.0
No	7	20.0
Frequency of intoxication (n=28)		
Once a week	1	3.6
Once in 2 weeks	1	3.6
Once in a month	9	32.1
More than once a month	6	21.4
Never drunk	11	39.3
***Factor influencing alcohol consumption (n=28)**		
Family gathering	27	96.4
Family and peer influence	13	46.4
Coping with problems	7	25.0
***Types of alcohol used (n=28)**		
Beer	25	89.3
Tuak	21	75.0
Cap Apek	12	42.9
Cap Langkau	7	25.0
Whiskey / Brandy	4	14.2
Knowledge on consequences of alcohol consumption		
Good	22	55.0
Poor	18	45.0
Mean score=1.45 (SD=0.50)		
Alcohol Use Disorder (n=28)		
Low risk (0-7)	19	67.9
Hazardous (8-15	8	28.6
High risk (16-19)	1	3.6
Mean score=1.36 (SD=0.56)		

**Multiple response*

Prevalence of Depression, Anxiety and Stress

Figure 2 shows about 20% of the respondents had depressive symptoms. Among them, 2.5% had severe depressive symptoms and the other 2.5% were extremely depressive. Over one-third (37.5%) were having anxiety and among them 2.5% had severe anxiety and 5% had extremely severe anxiety. Over one-fifth (22.5%) of respondents had stress, among whom 7.5% had moderate stress and 10% had severe stress.

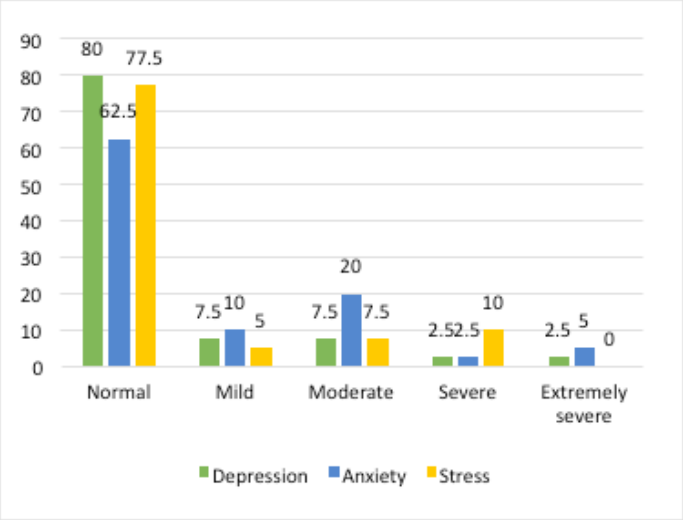

Figure 2: Distribution of mental health problems

Relationships of Alcohol Use Disorder, Depressive Symptoms and Sociodemographic Variables

Table 3 shows the correlation matrix of AUD with independent variables, which include depression, anxiety, stress, age, monthly household income and knowledge score, using Spearman correlation (rho) test. The result shows there was a positive weak correlation between AUD and i) depressive symptoms ($r_s = 0.11$, $p > 0.05$); ii) anxiety ($r_s = 0.09$, $p > 0.05$); and iii) stress ($r_s = 0.17$, $p > 0.05$), which were statistically not significant. The positive correlation indicates that a rise in AUD level will be correlated with a rise in depression, anxiety or stress. A significant and positive correlation was found between depression and i) anxiety ($r_s = 0.61$, $p < 0.01$), and ii) stress ($r_s = 0.58$, $p < 0.01$). There was a significant and positive correlation between age and i) depression ($r_s = 0.39$, $p < 0.05$), ii) anxiety ($r_s = 0.41$, $p < 0.01$), and iii) stress ($r_s = 0.32$, $p < 0.05$). As the age increases, the likelihood of having depression, anxiety and stress increase.

Table 3: Correlation matrix of alcohol use disorder with selected variables

	1	2	3	4	5	6	7
1. Alcohol Use Disorder	-						
2. Depression score	0.11	-					
3. Anxiety score	0.09	0.61**	-				
4. Stress score	0.17	0.58**	0.73**	-			
5. Age in years	-0.02	0.39*	0.41**	0.32*	-		
6. Monthly income (MYR)	-0.07	-0.18	-0.09	-0.05	-0.05	-	
7. Knowledge score	0.25	-0.06	0.06	-0.11	0.06	0.23	-

*** Significant at the 0.01 level (2-tailed); * Significant at the 0.05 level (2-tailed)*

DISCUSSION

The purpose of this study was to determine the patterns of alcohol consumption and generate hypothesis on AUD relationship with depressive symptoms among the rural Iban community in Sekuau, Sibu.

Among total 40 respondents, majority of them (87.5%) consumed alcohol and 80% had AUD (a history of alcohol consumption in the last 12 months). This study found that majority of respondents were grouped into low risk drinkers (67.9%), followed by hazardous drinkers (28.6%) and high-risk drinkers (3.6%). The likely reason that most of them were low risk drinkers was that most of them consumed alcohol during family gatherings and festive seasons such as Gawai, Christmas and New Year's festivals and weddings (96.4%). Alcohol use among the *Iban* is often associated with festival and they especially consume the traditional self-made alcohol which are *tuak* (rice wine) and *cap langkau* (rice spirits) (Amit, Hasking & Manderson, 2012). During gatherings, almost all are required to drink and refusal by guests to partake of these drinks is a breach of etiquette; as such drinking is an integral part of the culture of these tribes (WHO, 2004).

Our results indicated an overall prevalence rate of 20% for mild to extremely severe depressive symptoms, which means that 1 out of 5 of the longhouse community in our sample were at-risk for depression. The prevalence rate is lower than the national prevalence of 29.9% of psychological distress among Malaysians (Institute for Public Health (IPH), 1999). Specifically looking at DASS scale, 7.5 % reported mild and moderate levels of depression respectively, meanwhile 2.5 % reported severe and extremely severe depressive symptoms respectively. Compared to other studies in Malaysia, rates of severe depressive symptoms in this study was lower than previous studies, 11.3% (Wong and Lua, 2011), 12.3 % (Tan and Yadav, 2015), and 10.3% (Kader et al., 2014). As hypothesized, our study suggests a positive correlation between AUD and depressive symptoms. This result was supported by a study done by Schuckit, Smith and Kalmijn (2013) who found that 31% of depressive episodes experienced by people with AUD were induced by alcohol consumption. Another study done by Treeby and Bruno (2012) found that shame-proneness was positively associated with problematic alcohol use and drinking as a means of coping with depression-related symptomatology. Nevertheless, Bharati et al. (2017) formulated that depressive symptoms has a complex interaction between alcohol consumption and coping mechanism. Thus, conclusion cannot be made whether psychopathologies were present before starting of alcohol consumption or otherwise. A significant and positive correlation was found between depression and i) anxiety ($r=0.61, p<0.01$) and ii) stress ($r=0.58, p<0.01$). The result was supported by Angold et. al (1999) who found that 25-50% of adolescents with depression also met criteria for an anxiety disorder. This could be due to the fact that these two disorders share symptomatology and cognitive features such as social avoidance, sleep disturbance and fatigue (Garber & Weersing, 2010). This demonstrates high correlation between dimensional measures of anxiety and depressive symptoms, thus leading to strong level of comorbidity between these mental health problems (Stark & Laurent, 2001). Likewise, Olson and Surrette (2004) who conducted a study to assess the interrelationships among stress, anxiety, and depression in a population of law enforcement personnel, found that there was a strong relationship between depression and stress among law enforcement personnel. This was supported by some studies which postulated that stressors could predict or

trigger recurrence in patients with depression (Burcusa & Iacono, 2007). In addition, according to Birmaher et. al (2004), an exposure to stressful life events is one of the risk factors of developing depression.

Our study also found a significant and positive correlation between age and depressive, anxiety and stress symptoms. As the age increases, the likelihood of having depression, anxiety and stress increase. American Psychological Association (APA) (2013) stated that there is evidence of some natural body changes associated with aging may increase a person's risk of experiencing depression. An older adult may also sense a loss of control over his or her life due to failing eyesight, hearing loss and other physical changes, as well as external pressures such as limited financial resources. These and other issues often give rise to negative emotions such as sadness, anxiety, loneliness and lowered self-esteem, which in turn lead to social withdrawal and apathy. This finding was also supported by Borrill (2000) who showed that one of the causes of depression is the ageing brain.

STRENGTHS AND LIMITATIONS

This study is a hypothesis-generating study which can be quickly conducted over a few sites. One strength is that the research question can be addressed in a relatively short space of time. Furthermore, it is often better to test a new research hypothesis in a small number of subjects first to avoid spending too many resources, e.g. subjects, time and financial costs, on finding an association between a factor and a disorder when there really is no effect.

This study had a number of limitations. The data must be interpreted carefully, in particular confidence intervals and p-values. Although our results suggest that there is some evidence of positive relationship between AUD and depressive, anxiety and stress, they just missed statistical significance. The lack of statistical significance may be due to the study having insufficient power. Hence this hypothesis-generating study needed a larger confirmatory study.

CONCLUSION

This study found some evidence of positive relationship between AUD, depressive, anxiety, stress symptoms, and age, but it was based on a small sample size. These findings can be used to design larger confirmatory studies in large populations to confirm the correlations, if any.

ACKNOWLEDGEMENTS

We would like to express our gratitude to those who helped us to complete this research within the time allocated. First and foremost, we would like to extend our heartfelt appreciations to all the lecturers from the Department of Community Medicine and Public Health of UNIMAS for their comments and advice throughout this research. Secondly, special thanks to the head and residents of two Iban Longhouses at Sekuau, Sibu for welcoming us with open heart and generously giving their time to take part in our research by completing our questionnaires and joining our intervention activities. Our highest gratitude goes to Prof Dr Md Mizanur Rahman from the Department of Community Medicine and Public Health Faculty, UNIMAS for his lessons on how to use the Statistical Package for the Social Sciences (SPSS) software. The product of this research would not be possible without all of them.

AUD Study Group Members: Hilman, H., and Group Nair, S., Mohamad, H., Hanafie, M., Hakim, M., Rasyidah, A., Sibin, A., Allyen, E., Luke, F., Marcos, M., Affan, M., Abu Bakar, N., Ain, N., Syakirah, N., Akmal, N., Aziah, S., Nurhanisah, S., Nasrin, Z., Nien, A. S., Jie, K. C., Ying, C. P., Shan, F. P., Shirying, G., Marie, L., Matiin, M., Yin, W. M., Veerakumar, H., Apparau, D., Xin, L. Y., Shoon, T. N.

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Corresponding author
Professor Dr Andrew Kiyu
Department of Community Medicine and Public health
Faculty of Medicine and Health Sciences,
Universiti Malaysia Sarawak
Email: kduandrew@unimas.my

Experience in Universiti Malaysia Sarawak

MIURA KOUJIN, NORIYUKI MIYAMOTO, TAKUMI ISHIKAWA[1]

[1]Osaka University
9/Jan/2017-3/Feb/2017

I felt that the role of a doctor is different between Malaysia and Japan. In Japan, doctors only see patients. I think this is true in clinics as well as in hospitals. Each clinic and hospital has its manager, so doctors can concentrate on their job. Compared with Japan, I felt that Malaysian doctors have much more to do especially in government clinics and hospitals.

With a doctor and Dr Clifton at rural clinic

We visited one clinic following with on-the-spot research of DHO officers. In that hospital, a young woman was the only doctor and she presented the officers about the clinic and she also walked with the officers around the clinic and discussed the problems. The discussion included even about the air conditioning system. In another clinic, only one doctor managed the government clinic. He talked us about medical assistants. They can perform a physical examination and can take blood sample from patients. They play a significant role in Malaysian clinics because small clinics are short of doctors. We don't have 'medical assistants' in Japan so this system was very interesting to me. I was also impressed by the fact that young doctors managed the clinic alone in many government clinics and that they all perform the difficult jobs successfully.

One more thing I was surprised in Malaysia was that doctors and co-medicals were working together in a peaceful atmosphere. In Japan when we are busy, we become nervous and we speak less, so it was refreshing for me that many people in Malaysia work in a cheerful mood even when they look busy.

I was so happy to join the elective here. Students in Sarawak university were all so friendly. Every day someone invited us to dinner, sightseeing, volleyball, badminton, jogging, table tennis, even to her wedding ceremony! In my life I had had no chance to meet Muslim people before, joining Muslim wedding ceremony was precious experience, I really appreciate all the times I spent with my friends. All the teachers we met were very kind to us. All the teachers spoke to us in plain English, so we could understand what they say. Dr. Razita treated breakfast with many interesting stories. Dr. Clifton took us to Sunday market, a banana fry shop. Dr. Tang Mee kindly cared about our life in Kuching. All the teachers were warm-hearted.

We all hope to see everyone I met in Sarawak University someday.

Breakfast with Dr. Razita and her family

At Gunung Mulu National Park

Sunday market with Dr. Clifton

After Volleyball Competition

Research and Development

COMPILED BY MD MIZANUR RAHMAN
Department of Community Medicine and Public Health
Faculty of Medicine and Health Sciences
Universiti Malaysia Sarawak

A. *Research (New) 2017*			
No.	***Title (MyRA, FRGS, SGS, Non-funded***	***Type***	***Investigator***
1.	Perceived knowledge on Tobacco Control Law, Second Hand Smoking and Support to Tobacco Free Restaurants: An analytic cross-sectional study from owners, workers and customers perspectives	Non-funded	Principal investigator: Md Mizanur Rahman Co-researcher: Mohd Taha Arif, Rahim A.
2.	Prevalence of BCR-ABL1 Gene in Normal Population of Sarawak	Non-funded	Principal investigator: Kuan Jew Win Co-researcher: Anselm Su Ting, Tay Siow Phing, Isabel Fong

B. *Research (Ongoing) 2017*			
No.	***Title (MyRA, FRGS, SGS, Non-funded***	***Type***	***Investigator***
1.	Factors Associated with Care Seeking Behaviour of Bangladeshi Workers in Sarawak: A Respondent Driven Sampling Approach (Geran no; UNIMAS/TNC (PI)-04/09-01/17; JId 4(14)	SGS	Principal investigator: **Md Mizanur Rahman** Co-researcher: Mohamad Taha Arif, Razitasham bt safii, Zainab bt Tambi, Cliffton Akoi ak Pangarah, Zulkifli Jantan
2.	Rheumatic Heart Disease in High-Risk Population in Rural Sarawak	SGS	Principal investigator: Asri bin Said Co-researcher: ***Md Mizanur Rahman,*** Mohamed Ameenudeen B.A. Sultan Abd Kader, Helmy Hazmi
3.	Community based Screening for Chronic Kidney Disease in Kota Samarahan Division, Sarawak	MyRa	Principal investigator: Than Than Aye Co-researcher: Zulkernean, M, Razitasham, ***Md Mizanur Rahman,*** Mazdlifah
4.	Atherogenic index of plasma and its relationship with body fat among healthy adults in a public university	SGS	Principal investigator: Myat Su Bo Co-researcher: ***Cheah WhyeLian,***Soe Lwin, Tin Moe Nwin

5.	Association of physical fitness, cardiovascular risk and on-duty injury among police officers at Royal Malaysia Police (PDRM), of Samarahan.	SGS	Principal investigator: Myint Aung Co-researcher: ***Cheah Whye Lian,*** Soe Lwin, Tin Moe Nwin, Aye Aye Aung
6.	Anthropometric indicators as predictors of high blood pressure in adolescents in Sarawak	FRGS	Principal investigator: ***Cheah Whye Lian*** Co-researcher: Chang Ching Thon, Helmy Hazmi, Razitasham Safii
7.	Improving healthy energy balance- and obesity-related behaviours among preschoolers in Malaysia: feasibility of adapting the ToyBox-Study	MRC/ASM Newton Ungku Omar Fund	Principal investigator (Sarawak): ***Cheah Whye Lian*** Co-researcher: Julia Lee Ai Cheng
8.	Workplace Bullying and Metabolic Syndrome among Private Sector Workforce in Malaysia	FRGS	Principal investigator: Anselm Su Ting Co-researcher: Azlan Darus, Sharon Kwan, Victor Hoe, Marzuki Isahak
9.	Clinical Phenotypes of COPD Patients – Prevalence, Associations, Impacts	RAGS	Principal investigator: Chai See See Co-researcher: Anselm Su Ting
10.	Impact of Long Term Anticoagulants of Quality of Life: Warfarin versus New Oral Anticoagulants (NOAC)	RAGS	Principal investigator: Diana Ng Leh Ching Co-researcher: Anselm Su Ting
11.	Japanese Encephalitis In Sarawak: Human-Animal Interface Study	MyOHUN Seed Fund Award	Principal investigator: Chai See See Co-researcher : Dr Chua Hock Hin, Lela Su'ut, Nor Aliza Abdul Rahim, Dr Chia Pek Chin
12.	The distribution of Aedes spp. mosquitoes and Dengue viruses in Kuching, Sibu and Miri Divisions, Sarawak	Fundamental Research Grant Scheme: FRGS/ SKK01(01)/1289/2015(06)	Principal investigator: Dr Razitasham Safii Co-researcher : Lela Su'ut, Nor Aliza Abdul Rahim, Siti Fairouz Ibrahim
13.	Knowledge, attitude and practices towards leptospirosis among university students in Seremban and local community in Jempol area, Negeri Seremban	MyOHUN community based extension project fund	Principal investigator : Ass Prof Dr Shafinaz Amin Nordin Co-researcher: AP Dr Razitasham Safii, Ass Prof Dr Siti Khairani Bejo, Dr Gayathri Thevi Selvarajah, Abdul Rahman Mohamad Gobil

C. *Publications 2017*		
No.	***Title (APA style)***	***Type of Publication (Journal/conference proceeding)***
1.	**Rahman MM,** Rahim N, Arif MT. Barrier, Weakness and Utilization of Pre-Pregnancy Clinic Services. Archives of Public Health (2017) 75:67 DOI 10.1186/s13690-017-0236-2	Journal
2.	Hann LJ, **Rahman MM.** Pattern and Factors associated with home Accidents among Under-five Children and Its Care Seeking Behavior in selected rural Communities of Kota Samarahan district, Sarawak, Malaysia. *Bangladesh J Medicine* 2017;28:58-63	Journal
3.	Ying WK and **Rahman MM**. Factors Determining Attempt-To-Quit Smoking Among Adult Current Smokers in Sarikei, Sarawak, Malaysia. *Malaysian Journal of Public Health Medicine* 2017;17 (2): 96-102.	Journal
4.	**Rahman MM**, Luke F, Letchumi S, Nabila F, Wong C, Ling Z. Pattern of internet use and medico-social and behavioural problems associated with its use among university students. *Community Medicine and Public Health Bulletin* 2017, 4(1):12-19	Journal
5.	**Rahman MM**, Arif MT, Suhaili MR, Razak MFA, Tambi Z, Akoi C, Azihan NZ, Nanthakumar. Knowledge, Attitude, Pictorial Health Warnings and Quitting Attempt to Smoking In Sarawak, Malaysia. *Bangladesh Journal of Medical Science* 2017;16 (02): 266-273	Journal
6.	Puthiaparampil T, **Rahman MM**, Lim IF. From Item Analysis to Assessment Analysis: Introducing New Formulae. *MedPublish* 2017, 6(1): 0-8, Paper No. 7. (11/1/2017). DOI: http://dx.doi.org/10.15694/mep.2017.000007	Journal
7.	Melvin Chung HL, Helmy H, **Cheah WL**. Role Performance of Community Health Volunteers and its associated factors in Kuching District, Sarawak. *Journal of Environmental and Public Health* 2017; ID 9610928, 9 pages, https://doi.org/10.1155/2017/9610928	Journal
8.	Johny K, **Cheah WL**, Razitasham S. Disclosure of Traditional and Complementary Medicine Use and Its Associated Factors to Medical Doctor in Primary Care Clinics in Kuching Division, Sarawak, Malaysia. *Evidence-Based Complementary and Alternative Medicine* 2017; ID 5146478, 10 pages, https://doi.org/10.1155/2017/5146478.	Journal
9.	**Cheah WL**, Chang KH, Muhammad Affan A, NajihahAyuni MH, Yek EC, Yeap YN. Commitment and motivation in practicing yoga among adults in Kuching, Sarawak. *Indian Journal of Traditional Knowledge* 2017;16(Suppl):S81-S87.	Journal
10.	**Cheah WL**, Chang CT, Helmy H, Razitasham S, Grace Kho WF. Hypertension: its prevalence and association with obesity among indigenous adolescents of Sarawak, Malaysia. Journal of Human Hypertension 2017;31(10):673-674.	Journal
11.	**Cheah WL**, Majorie Ensayan J, Helmy H, Chang CT. Hypertension and its association with Anthropometric Indexes among students in a public university. Malaysian Family Physician 2017 (in press).	Journal

12.	Kuan JW, **Su AT**, Leong CF. Pegylated granulocyte-colony stimulating factor versus non-pegylated granulocyte-colony stimulating factor for peripheral blood stem cell mobilization: A systematic review and meta-analysis. Journal of Clinical Apheresis 2017; 1-26. DOI: 10.1002/jca.21550.	Journal
13.	**Zainab T**, Aung AA, Esther SM, Farzana SJ, Fikri B and Loshinny M, Knowledge on Breakfast, breakfast habits and nutritional status of adults in two rural villages in Kuching, Sarawak. Mal J Nutr, Vol 23 (supplement) May 2017: S108-S109	Journal
14.	Utap MS and **Kiyu A**. Active case detection of leprosy among indigenous people in Sarawak, East Malaysia. Lepr Rev. (2017) 88,563 567. https://www.lepra.org.uk/platforms/lepra/files/lr/Dec17/Lep563-567.pdf	Journal
15.	Toh TH, Tan VWY, Lau PST, **Kiyu A**. Accuracy of *Modified Checklist for Autism in Toddlers* (*M-CHAT*) in Detecting Autism and Other Developmental Disorders in Community Clinics. J Autism Dev Disord DOI 10.1007/s10803-017-3287-x. Published on line 02 September 2017.	Journal
16.	Razitasham S, Hayati K (2017). One Health Manual: On Handling Zoonotic Disease Outbreak In Malaysia. *Developing, Evaluating, Refining Hypothesis*. Pp 67-84. Malaysia One Health University Network (MYOHUN). Perpustakaan Negara Malaysia. ISBN 978-967-960-416-0	Chapter in book
17.	Rashid AK, **Kiyu A**, Khebir bin Verasahib, Rozanah Asmah Abu Samad, Azizah Darus, Sarah Dadang Abdullah, Badrul Hisham b Abd Samad (2017). One Health Manual: On Handling Zoonotic Disease Outbreaks in Malaysia. National Coordinating Office, Malaysia One Health University Network (MYOHUN). ISBN 978-967-960-416-0	Book

D. ***Conference Proceeding 2017***

No.	***Title***	***Venue & Organizer***	***Year/Date***	***Level (National/ International)***
1.	Aye TT, Prevalence of Microalbuminuria among Community People in Samarahan District, Sarawak.	Silver Jubilee Conference 2017 (USJC17)	October 18-20, 2017	National
2.	Meng PCC, Su AT, Rahman MM. Workplace Bullying and its Association with Depression and Self-Esteem amongst Health Care Workers.	Silver Jubilee Conference 2017 (USJC17)	October 18-20, 2017	National
3.	Jores D, Arif MT, Rahman MM. Factors associated with food hygiene practices among street food vendors in Padawan, Sarawak.	4th UNIMAS Public Health Seminar 2017	25-26 October 2017	National
4.	Suut N, Rahman MM, Putit Z. Coping strategies taken by Stroke Caregivers in Sarawak.	4th UNIMAS Public Health Seminar 2017	25-26 October 2017	National

5.	Mizan, S, Rahman MM, Razitasham, Ahmad SK. Factors influencing use of ante-natal care: Evidence from Urban Primary Health Care Project in Bangladesh.	4th UNIMAS Public Health Seminar 2017	25-26 October 2017	National
6.	Lemin A, Rahman MM, Akoi Pangarah. Stigma and Discrimination toward people living with HIV/ AIDS and the factors that influence in Sarawak, Malaysia: A Cross-Sectional Community Based Study.	4th UNIMAS Public Health Seminar 2017	25-26 October 2017	National
7.	Azhar A, Rahman MM. Willingness to Pay for PHC Service: More Than RM1?	4th UNIMAS Public Health Seminar 2017	25-26 October 2017	National
8.	Jawa D, Rahman MM. Health Related Quality of Life among Menopausal Women.	4th UNIMAS Public Health Seminar 2017	25-26 October 2017	National
9.	Myat Su Bo, **Cheah Whye Lian**, Ng Ming Hui, Dayang Nur Fazrina Awang Buang, Mimi Syazwani Junaidi, Isthera Uding Shilling, Soe Lwin, Tin Moe Nwe, Than Than Win, Myint Aung. Prevalence of Cardiovascular Risk Factors and Its Differences Between Genders in A Public University.	Silver Jubilee Conference 2017 (USJC17)	October 18-20, 2017	National
10.	Soe Lwin, Myat San Yi, Mardiana binti Kipli, Tin Moe Nwe, **Cheah Whye Lian.**Risk Factors of Preterm Delivery Among Mother with Preterm Contraction in Sarawak.	Silver Jubilee Conference 2017 (USJC17)	October 18-20, 2017	National
11.	**Cheah Whye Lian**, Chang Ching Thon, Helmy Hazmi, Razitasham Safii, Grace Kho Woei Peng. Hypertension: its prevalence and association with obesity among indigenous adolescents of Sarawak, Malaysia.	10th Asia Pacific Conference on Clinical Nutrition	November 26-29, 2017	International
12.	Grace Kho Woei Peng, **Cheah Whye Lian**, Chang Ching Thon, Helmy Hazmi, Razitasham Safii. Prevalence Of Elevated Blood Pressure And Its Predictors Among Secondary School Students In Sarawak.	Asia Pacific Conference of Public Health	September 11-13, 2017	International
13.	Myat Su Bo, **Cheah Whye Lian**, Soe Lwin, Tin Moe Nwe, Myint Aung, Than Than Win. Atherogenic Index Of Plasma (Aip): Understanding Its Relationship With Cardiovascular Disease Risk Factors.	Asia Pacific Conference of Public Health	September 11-13, 2017	International
14.	L Suut, MM Nurazim, AM Taha, JT Katip, AR Nor Liza, Haironi Yusuff, S Razitasham. Risk factors associated with Leptospirosis among rural residents in Sarawak.	10th International Leptospirosis Society Conference 2017 Palmerson North, New Zealand (poster)	27 Nov-1 Dec 2017	International

15.	L Suut, MM Nurazim, AM Taha, JT Katipo. Diversity and Prevalence of leptrospirasp in wild rodents in Sarawak.	10th International leptospirosis Society Conference 2017, Palmerston North, New Zealand (oral)	27 Nov-1 Dec 2017	International.
16.	Zainab T, Aung AA, Esther SM, Farzana SJ, Fikri B and Loshinny M, Knowledge on Breakfast and Breakfast habits and nutritional status of adults in two rural villages in Kuching, Sarawak.	1st Southeast Asia Public Health Nutrition Conference Kuala Lumpur (poster)	14 May-17 May, 2017	International
17.	Kiyu A. "Challenges in Providing Access to Emergency and Essential Surgical Services in Rural Health Clinics in Sarawak"	Annual Scientific Congress of the College of Surgeons, Academy of Medicine of Malaysia, at Pullman Hotel, Kuching, Malaysia.	from 19th May 2017,	National
18.	Kiyu A. "Changing Lives – Health Sciences Leading the Way"	Presented at i-Sihat 2017, Primiera Hotel Kuala Lumpur. Organiser: UniversitiKebangsaan Malaysia	1-2 August 2017	National

E. Training and Workshop

1.	***Title of the workshop/training***	***MRC-ASM Newton Ungku Omar : Improving healthy energy balance-and obesity-related behaviours among preschoolers in Malaysia: feasibility of adapting the ToyBox-Study (Toybox Malaysia) : Theory Of Change (TOC) mapping discussion with KEMAS stakeholders***
	Facilitators	Associate Professor Dr Cheah Whye Lian
	Objective of the workshop	1. To explore the perception of the participants on the issue of obesity 2. To identify the factors contributing to the success of implementation of Toybox Malaysia in Sarawak 3. To discuss the potential barriers and solution to the implementation of Toybox Malaysia in Sarawak
	Date	26 May 2017
	Venue	Imperial Hotel, Kuching, Sarawak
	No. of participants,	29
	Achievement etc.	Input from the workshop to the implementation of Toybox Malaysia in Sarawak

2.	***Title of the workshop/training***	***MRC-ASM Newton Ungku Omar: Improving healthy energy balance- and obesity-related behaviours among preschoolers in Malaysia: feasibility of adapting the ToyBox-Study (Toybox Malaysia) : Train the Teachers (TOT) Workshop***
	Facilitators	Associate Professor Dr Cheah Whye Lian
	Objective of the workshop	1. To train KEMAS kindergarten teachers on Toybox modules 2. To discuss the issues and constraints arise during the intervention programme
	Date	6-8 December 2017
	Venue	Imperial Hotel, Kuching, Sarawak
	No. of participants,	20
	Achievement etc.	Teachers were trained in conducting the intervention modules
3.	***Title of the workshop/training***	***Scientific Writing organized by Clinical Research Centre (CRC), Sibu Hospital.***
	Facilitators	Professor Dr Andrew Kiyu
	Objective of the workshop	The objective was to guide the participants, who had completed their data collection, in analysing their data and writing up the research for publication.
	Date	3-5 October 2017
	Venue	Kingwood Hotel, Sibu
	No. of participants,	20
	Achievement etc.	Most of the participants completed their first draft of the manuscript.
4.	***Title of the workshop/training***	***Post Seminar workshop on Basic to intermediate Biostatistics***
	Facilitators	Professor Dr Md Mizanur Rahman
	Objective of the workshop	The course is designed to fulfil the following objectives: 1. To provide the participants with the skills to use SPSS for processing and analysing quantitative data 2. To guide the participants to generate data for univariate and multivariate analysis 3. To guide the participants to generate report using SPSS output
	Date	17 October 2017
	Venue	Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak
	No. of participants,	30
	Achievement etc.	Participants were trained and got the hands-on-training on Basic to intermediate statistics, its application and use in public health and clinical research.

5.	***Title of the workshop/training***	**Basic Biostatistics and SPSS**
	Facilitators	Professor Dr Md Mizanur Rahman
	Objective of the workshop	The course is designed to fulfil the following objectives: 1. To provide the participants with the skills to use SPSS for processing and analysing quantitative data 2. To introduce the basic functions of SPSS 3. To guide the participants to process data preparation and generate statistics for normality testing 4. To guide the participants to generate data for univariate and multivariate analysis 5. To guide the participants to making graphs and diagrams 6. To guide the participants to generate report using SPSS output
	Date	18-19 May 2017
	Venue	Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak
	No. of participants,	**30**
	Achievement	Participants were trained and got the hands-on-training on Basic to intermediate statistics, its application and use in public health and clinical research.

6.	**Title of the workshop/training**	**4th Public Health Seminar** **Theme: Life Course Approach To Family Health**
	Organizer	Department of Community Medicine and Public Health and DrPH students
	Objective of the Seminar	1. To create awareness among health care professionals and public health workers on life course approach to family health 2. To gain new insight in attaining ideal in Public Health Services on life course approach 3. To strengthen collaboration and networking among various agencies or organizations.
	Date	25-26 October 2017
	Venue	Seminar Hall, PITAS, Universiti Malaysia Sarawak
	No. of participants	113
	Achievement	1. The seminar was organized smoothly as planned and received participations from various background of participants from multiple agencies. 2. The topics and issues were elaborated and discussed in a very informative and interactive manner by the distinguish speakers 3. All of the topics discussed are very relevant and important family health issues and received a very good respond from the participants.

7.	**Title of the workshop/training**	**Field Epidemiology for One Health Practitioners**
	Organizer	Malaysia One Health University Network (MyOHUN)
	Facilitators	Assoc Prof Dr Razitasham bt Safii
	Objective of the workshop	To increase One Health Workforce capacity to prevent, detect and respond to Infectious Disease and zoonotic diseases.
	Date	21-25 August 2017
	Venue	Kuching, Sarawak
	No. of participants	50

Achievement

1. One table top outbreak exercise completed
2. One practical assessment on risk assessment completed
3. One forum focusses on rabies conducted
4. One practical session on core competencies – communication
5. Lectures and demonstration on the uses of surveillance

F.	**Students Research**		
	Tittle	*Course*	*Researcher(S)*
1.	Factors Influencing Exclusive Breastfeeding Rates in Sarikei Division Sarawak, A Cross-sectional Study	MPH	Principal Investigator: Mohd Fahmi Bin Ismail (17030138) Supervisor: Prof Datu Dr Zulkifli Jantan
2.	A Cross-sectional Study Assessing Pregnancy Outcomes Among Female Healthcare Workers in Sarawak General Hospital	MPH	Principal Investigator: Gregory Joseph Xavier (17030141) Supervisor: Assoc Prof Anslem Su Ting
3.	Barrier, Physical Activity and Sedentary Behaviour Among Pre-schooler in Rural District of Kuching and Samarahan Division	MPH	Principal Investigator: Mohd Fakhree Bin Saad (17030142) Supervisor: Assoc Prof Dr Cheah Whye Lian
4.	Nutritional Status of Children with Learning Disability Attending CNR in Kuching Division	MPH	Principal Investigator: Nur Ezzah Abd Rahim (17030143) Supervisor: Dr Helmy Hazmi
5.	Knowledge, Self-Reported Safety Practice of Caregivers and Day-care Setting on Unintentional Injury Prevention among Toddler Registered Day-care Centres in Kuching Division, Sarawak	MPH	Principal Investigator: Lim Siong Hee (17030146) Supervisor: Dr Helmy Hazmi
6.	Factors Relating to Acceptance of Dengue Vaccine in Sibu, a High Endemic Area in Sarawak	MPH	Principal Investigator: Shaiful Sharizal bin Othman (17030147) Supervisor: Prof Datu Dr Andrew Kiyu
7.	Alcohol Use Disorder Among Rural Iban Adolescents in Sibu Sarawak.	MPH	Principal Investigator: Christopher Eugene Festus (17030148) Supervisor: Dr Rosalia Binti Saimon
8.	Morbidity Patterns Among Smoker and Non-smoker family and their total out of pocket expenditure in Sub-district of Padawan	MPH	Principal Investigator: Neilson Richard Seling (17030149) Supervisor: Prof Dr Md Mizanur Rahman
9.	Knowledge Attitude and Skills on Maternal and Neonatal Care Among Primary Healthcare Workers in Kuching	MPH	Principal Investigator: Mariana bt Tumin (17030151) Supervisor: Prof Dr Md Mizanur Rahman
10.	Factors Associated with Delay in Tuberculosis Management in Sarawak	DrPH	Principal Investigator: Ahmad Hafiz Mohamad (17040001) Supervisor: Prof Datuk Dr Andrew Kiyu and Prof Dr Md Mizanur Rahman
11.	Association between Health Literacy and Knowledge, Beliefs and Behaviour Regarding Colorectal Cancer among Adult Population in Sarawak	DrPH	Principal Investigator: Drend Jores (17040006) Supervisor: Prof Dato Dr Hj Abdul Rahim Abdullah

12.	Disordered Eating Behaviour among University Students in Kota Samarahan, Sarawak	DrPH	Principal Investigator: Edmund Shin Chin Vui (17040005) Supervisor: Assoc Prof Dr Chye Whye Lian and Dr Helmy Hazmi
13.	Vaccine Wastage Factors in Primary Health Care Settings in Sarawak	DrPH	Principal Investigator: Kaliaperumal A/L Rathakrishnan (17040002) Supervisor: Prof Datu Dr Zulkifli Jantan and Prof Dr Md Mizanur Rahman
14.	Household Coping and Resilience and Its Relationship with Household Food Security among Flood Victims in Sarawak; An Analysis of Structural Equation Model	DrPH	Principal Investigator: Nazibah Baharin (17040007) Supervisor: Prof Dr Md Mizanur Rahman and Prof Tan Sri Datu Dr Mohd Taha Arif
15.	Independent Living Skills Among Young Adults with Down Syndrome: Cases from Kuching, Sarawak	DrPH	Saiful Ridzuan Abdul Hadi (17040004) Supervisor: Assoc Prof Dr Razitasham Safii and Dr Rosalia Saimon
16.	Effect of Educational Intervention on Dog Bite among School Aged Children in Southern Region of Sarawak	DrPH	Principal Investigator: Syahrizal Abdul Halim (17040003) Supervisor: Dr Rosalia Saimon and Assoc Prof Dr Razitasham Safii
17.	Development of Capitation Rate for Healthcare Services in Health Clinics in Sarawak	DrPH	Principal Investigator: Winnie Johnny (17040008) Supervisor: Assoc Prof Dr Zafar Ahmed

Please send contributions to :

Hajah Zainab bt Tambi
tzainab@fmhs.unimas.my

or

Md Mizanur Rahman
rmmizanur@unimas.my

First issue can be found in
http://www.fmhs.unimas.my/cmph/