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Determinants of tobacco smoking among presumptive TB patients in Taungoo Township, Myanmar

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Abstract

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A hospital-based cross-sectional study was conducted in Taungoo Township, Myanmar to examine prevalence and determinants of current tobacco smokers among presumptive TB patients aged 18 years and above. A total of 400 presumptive TB patients which was drawn by purposive sampling were face-to-face interviewed using a structured questionnaire in April, 2017. The questionnaire had three parts: socio-demographic factors, socio-environmental factors and psycho-social factors based on social cognitive theory. Harmful alcohol drinking and mental distress were measured by using Alcohol Use Disorders Identification Test (AUDIT-C) and Kessler Psychological Distress Scale (K-10), respectively. Current tobacco smokers, the outcome measure were identified based on questionnaires of Global Adult Tobacco Survey (GATS). Chi-square test and multiple logistic regression were used to examine determinants of tobacco smoking.

Prevalence of current tobacco smokers was 54%. In multiple logistic regression, factors significantly associated with tobacco smoking were **sex** (Adj OR=4.65, 95%CI=2.14-10.12 for men compared to women), **education levels** (Adj OR=3.89, 95%CI=1.19-12.65 for middle or high school and Adj OR=4.39, 95%CI=1.22-15.77 for primary school or less compared to college or university), **income** (Adj OR=3.05, 95%CI=1.42-6.54 for middle income compared to low income), **marital status** (Adj OR=1.97, 95%CI=1.01-3.81 for living without a spouse compared to living with a spouse), **harmful alcohol drinking** (Adj OR=3.42, 95%CI=1.77-6.60), **mental distress** (Adj OR=2.97, 95%CI=1.12-7.89), and **knowledge about smoking hazards** (Adj OR=4.94, 95%CI=2.49-9.76 for middle level, and Adj OR=6.50, 95%CI=2.45-17.24 for low level compared to high level).

This study showed one in two presumptive TB patients were current smokers. Current smokers were particularly male, from low socioeconomic status and had poor knowledge, lived alone, drank alcohol, and had mental distress. This could help policy makers to identify people at risk of negative health outcomes of diseases, and promote the tobacco cessation services with integrated alcohol intervention in health facilities as a component of TB program in Myanmar.

Keywords: tobacco smoking, knowledge, harmful alcohol drinking, presumptive TB patients, Myanmar

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ปัจจัยที่มีความสัมพันธ์กับการสูบบุหรี่ในกลุ่มผู้สงสัยวัณโรคในเมืองเต่างู ประเทศพม่า

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บทคัดย่อ

จอ ซาน ตุน โซ อะ หงษ์ และจิราพร ชมพิกุล
ปัจจัยที่มีความสัมพันธ์กับการสูบบุหรี่ในกลุ่มผู้สงสัยวัณโรคในเมืองเต่างู ประเทศพม่า
ว. สาธารณสุขและการพัฒนา 2560:15(3):33-50

การศึกษานี้เป็นการศึกษาแบบภาคตัดขวางโดยใช้โรงพยาบาลเป็นฐานในการเก็บรวบรวมข้อมูลในเมืองเต่างู ประเทศพม่า เพื่อศึกษาความชุกและปัจจัยที่มีความสัมพันธ์กับการสูบบุหรี่ในกลุ่มผู้สงสัยวัณโรคที่มีอายุตั้งแต่ 18 ปีขึ้นไป ผู้สงสัยว่าจะป่วยเป็นวัณโรคจำนวน 400 คนที่สุ่มได้โดยวิธีการสุ่มตัวอย่างแบบเจาะจงในเดือนเมษายนปี พ.ศ. 2560 เก็บรวบรวมข้อมูลโดยใช้แบบสอบถามที่มีโครงสร้างด้วยการสัมภาษณ์แบบตัวต่อตัว แบบสอบถามมีสามส่วน ได้แก่ ปัจจัยทางสังคมประชากร ปัจจัยทางสังคมสิ่งแวดล้อม และปัจจัยทางจิตสังคมที่เกิดจากทฤษฎีปัญญาสังคม สำหรับการดื่มแอลกอฮอล์ที่เป็นอันตรายและความทุกข์ทางจิตใจวัดโดยใช้การทดสอบ Alcohol Use Disorders Identification Test (AUDIT-C) และ Kessler Psychological Distress Scale (K-10) ผู้สูบบุหรี่ในปัจจุบันได้รับการวัดผลตามแบบสอบถามของ Global Tobacco Survey (GATS) วิเคราะห์ข้อมูลโดยใช้การทดสอบไคสแควร์ และการถดถอยลอจิสติกพหุคูณเพื่อศึกษาปัจจัยที่มีความสัมพันธ์กับการสูบบุหรี่ในกลุ่มผู้สงสัยวัณโรค

ความชุกของผู้สูบบุหรี่ในปัจจุบันเป็น 54% ผลการวิเคราะห์ด้วยการถดถอยลอจิสติคพหุคูณพบว่า ปัจจัยที่มีความสัมพันธ์กับการสูบบุหรี่ในปัจจุบันอย่างมีนัยสำคัญ ได้แก่ **เพศ** (Adj OR = 4.65, 95% CI = 2.14-10.12 ผู้ชายเปรียบเทียบกับผู้หญิง) **การศึกษา** (Adj OR = 3.89, 95% CI = 1.19-12.65 สำหรับการศึกษาระดับมัธยม Adj OR = 4.39, 95% CI = 1.22-15.77 สำหรับการศึกษาระดับประถมศึกษาหรือต่ำกว่าเปรียบเทียบกับวิทยาลัยหรือมหาวิทยาลัย) **รายได้** (Adj OR = 3.05, 95% CI = 1.42-6.54 รายได้ปานกลางเปรียบเทียบกับรายได้ต่ำ) **สถานภาพสมรส** (Adj OR = 1.97, 95% CI = 1.01-3.81 ผู้ที่ไม่ได้อยู่กับคู่สมรสเปรียบเทียบกับผู้ที่อยู่กับคู่สมรส) **การดื่มแอลกอฮอล์ที่เป็นอันตราย** (Adj OR = 3.42, 95% CI = 1.77-6.60) **ความทุกข์ทางจิตใจ** (Adj OR = 2.97, 95% CI = 1.12-7.89) และ**ความรู้เกี่ยวกับอันตรายจากการสูบบุหรี่** (Adj OR = 4.94, 95% CI = 2.49-9.76 สำหรับความรู้ปานกลางและ Adj OR = 6.50, 95% CI = 2.45-17.24 สำหรับความรู้น้อยเปรียบเทียบกับความรู้สูง)

การศึกษานี้แสดงให้เห็นว่าประมาณ 1 ใน 2 รายของผู้สงสัยวัณโรคเป็นผู้สูบบุหรี่ในปัจจุบัน กลุ่มเสี่ยงเป็นเพศชายมีสถานะทางเศรษฐกิจและสังคมต่ำและมีความรู้น้อย มีสถานภาพสมรสโสด/แยก/หย้า/หม้าย ดื่มแอลกอฮอล์ และมีความทุกข์ทางจิตใจ ผลการศึกษานี้จะช่วยให้ผู้กำหนดนโยบายสามารถระบุบุคคลที่มีความเสี่ยงต่อการมีภาวะสุขภาพเสี่ยงต่อการเกิดโรค และควรส่งเสริมการให้บริการเลิกสูบบุหรี่พร้อมด้วยการเลิกดื่มแอลกอฮอล์แบบบูรณาการในกลุ่มเสี่ยงนี้ในสถานบริการสาธารณสุขซึ่งเป็นส่วนหนึ่งของโครงการวัณโรคในประเทศพม่า

คำสำคัญ: การสูบบุหรี่ ความรู้ การดื่มแอลกอฮอล์ที่เป็นอันตราย ผู้สงสัยวัณโรค พม่า

Introduction

As tuberculosis (TB) remains the world's leading cause of death from a single infectious agent, accounting for a quarter of the avoidable adult deaths in the developing world, TB is a major global and health problem. Globally in 2015, there were an estimated 10.4 million incident cases of TB, equivalent to 142 cases per 100,000 populations[1]. More than 95% of deaths caused by TB occur in low- and middle-income (LMIC) countries[2]. In 2015, Myanmar was one of the top 30 TB burden countries and also one of the 5 highest TB incidence countries in South East Asia Regions and TB incidence was 365 calculated on 100,000 populations and mortality rate due to Pulmonary TB (PTB) was 49% based on 100,000 populations in Myanmar[3].

Though many biological, socioeconomic and behavioral risk factors are known to be associated with the development of PTB[3-4], tobacco smoking is one of the leading preventable causes of premature death. Tobacco smoking and TB are two major alarming global health issues posing immense threats to human populations[5]. There are many studies on the relationship between tobacco smoking and TB. Nevertheless, the impact of smoking on TB has only been demonstrated in the last decade. Smoking exposure in both active and passive forms are independently considered as risk factors for TB infection by delayed bacteriologic clearance and increased susceptibility to infection[4,6]. In addition, tobacco smoking is found to be associated with the progression of TB infection to disease, greater disease severity, and increased risk of post-treatment relapse and TB related mortality[4].

WHO and the International Union against TB and Lung Disease recognized the association between TB and the tobacco epidemic. Thus, they recommended joint initiatives by national TB and tobacco control programs[7]. In Myanmar, tobacco control program and TB control programs were established in 2006. Identifying tobacco users and providing tobacco cessation services are expected to reduce the burden of TB[8]. But, there remain many challenges including human resources, budget limitation and allocation so on forth.

The WHO recommends the assessment of tobacco use and tobacco cessation services routinely for all diagnosed TB patients[9]. Yet, this strategy seems to provide limited benefits at reduction of TB burden as the tobacco cessation service is directed only for TB patients. Efforts in tobacco control in general can contribute to a greater reduction of the number of incident TB cases. Community-based tobacco control strategies are resource intensive. Furthermore, Myanmar National Tobacco Control Program is at infant stage. In the Myanmar context, identifying tobacco smoking users in a health facility will be a short-term effective option.

A presumptive TB refers to a patient who was previously known as a TB suspect and who presents with symptoms or signs suggestive of TB more than 2 weeks, such as cough, chest pain and fever[10]. Among these presumptive TB patients, nearly 40% of the patients developed active TB[11]. Presumptive TB patients are more vulnerable, easily to get TB infection because of tobacco smoking compared to normal persons.

There are many studies on determinants of tobacco smoking. Smoking has been socially accepted in Myanmar. Men are more likely to smoke compared to women[12]. People who smoked tobacco also drink

alcohol more frequently and more heavily than non-smokers[13]. In addition, it was also reported that smokers tended to start to smoke because family members or friends smoke and smokers believed that smoking make much easier to socialize with others[14]. People in low socioeconomic status were more likely to smoke, because smokers tend to have poor knowledge on harmful effect of smoking on health[15]. Those having mental distress or depression was more likely to smoke tobacco[16].

Although there are many studies on smoking, to our knowledge, there is little study on the tobacco smoking among presumptive TB patients. Thus, this study aimed to assess the burden and determinants of tobacco smoking among presumptive TB patients at a tertiary care hospital in Taungoo district, Myanmar, where is one of the 30 countries with a high burden of TB. This study can provide some insights into the determinants of tobacco smoking among presumptive TB patients, which could help policy-makers to identify people at risk of the negative health outcomes of the double burden of TB in Myanmar.

Methods

A hospital-based cross-sectional study was conducted at a tertiary care Hospital in Taungoo Township, Myanmar in April, 2017. The study targets were presumptive TB patients aged 18 years and above who attended TB department and had at least one of the major symptoms of TB more than 2 week, such as cough, low grade fever and chest pain according to WHO presumptive TB operational definition[17]. The required sample (n=372) was estimated using a confidence interval of 95%, an acceptance error of 5%, prevalence of current tobacco smoking among PTB patients in Kyimyindine Township, Yangon was 41% according to Township TB centre data from November 2006 to June 2007[12].

Taungoo District covered 7 townships and there was a huge TB campaign performing TB screening and treatment given in the area. Regular screening numbers in the hospital are 15-25 presumptive TB patients per day. A total of 400 presumptive patients was drawn by purposive sampling. Informed consent was obtained from each participants before starting interview process. Face to face interview was conducted by researchers and trained research assistants to complete the structured questionnaire. Interviews were done in a separate, well ventilated rooms with good lighting of TB department at the Taungoo General Hospital. Researchers wore effective protective matters like N-95 masks to protect disease transmission while interviewing. The study was approved by the Institutional Review Board of Social Sciences, Mahidol University (Certificate of MU-SSIRB Approval No: 2017/056.1403).

Questions were either developed by research team based on literature review or adopted from previous studies. The validity of the questionnaire was checked for content validity by the advisor team and experts. The reliability and validity were examined by a pre-test of 30 respondents living in Htan Ta Pin Town which was not this study area. As some items were difficult for answering and understanding, the questionnaire was revised and modified again after the pretest based on the feedback from the respondents.

The questionnaire was divided into three parts based on social cognitive theory[18]. Socio-demographic factors included age, sex, occupation, monthly income, education, ethnicity, religion, marital status and

alcohol consumption. For socio-environmental factors, number of peers and family members smoking and their smoking frequencies, source of tobacco products and perceived affordability were included. For psycho-social factors, experience of mental distress, self-reported health status, and tobacco-related knowledge were involved in the study. Knowledge was modified and measured with 6 items from original 7 statements for tobacco related knowledge and attitudes questionnaires that used in a cross-sectional study among medical students and recent graduates in Argentina[19]. In each item of knowledge, participants were given one point for correct answer and zero point for incorrect and not sure answer. Total scores of 6 questions were calculated by summing the scores of 6 questions (range from 0 to 6 scores). The reliability of the knowledge questionnaires which was assessed by using Kuder Richardson (KR-20) was 0.677. Knowledge scores were classified into 3 groups by tertiles: low (< 2 scores), middle (2-4 scores) and high (>4 scores).

Mental distress was measured and modified by using Kessler's Psychological Distress Scale (K-10) which is a 10 item questionnaire with questions regarding emotional states (e.g anxiety, depression)[16]. Four questions were adjusted to conduct mental distress in presumptive TB patients with 5 Likert Scales (from none of time, a little time, sometime, most of time and all of time) as an example of question with "During past 4 weeks, about how often did you feel depressed?" The scores ranged from 4-20 and were grouped into 3 levels for descriptive purposes: low (4-9), moderate (10-15) and high (16-20). Low scores were assumed as "without mental distress" and moderate and high scores were assumed as "having mental distress".

Perceived affordability was asked with the question of "Do you think that you always have enough money to buy tobacco smoking products, such as cigarettes?" with 3 responses options (yes, no, do not know). A response of "Do not know" was combined with "no" response in analyses.

Alcohol consumption over the last year was measured using AUDIT-C 20. Each AUDIT-C question has 5 response options[20]. Points allotted are: 0 points, 1 point, 2 points, 3 points, 4 points. In men, a score of 5 or more is considered as indicative of hazardous drinking and at higher values also of alcohol use disorder, and the corresponding score in women is 4 or more[20]. Generally, the higher the score, the more likely it is likely that the person's drinking is affecting his or her health and safety.

Tobacco smoking status was categorized into two groups based on Global Adult Tobacco Survey (GATS) guidelines (2009)[21-22]: current smokers and non-smokers of tobacco. Current tobacco smokers included: i) daily tobacco smokers, ii) occasional (less than daily) tobacco smoker and former daily, and iii) occasional (less than daily) tobacco smoker and never daily smokers, while non-smoker of tobacco group included: i) former daily tobacco smokers, ii) former occasional (less than daily) tobacco smoker, and iii) never smokers of tobacco.

Descriptive statistics (frequency and percentage) were used to describe the distribution of the sample. Chi-square test was used to examine the associations between each independent variable and tobacco smoking. Through Chi-square test, associations with p-value < 0.05 were considered for further analysis as an independent variable in multiple logistic regression. Finally, multiple logistic regression was used to examine the predictors of tobacco smoking

among presumptive TB patients. A p-value of less than 0.05 was considered statistically significant for the statistical tests.

Results

Of a total of 400 presumptive TB patients, 54% of presumptive TB patients are current smokers (46% of daily smokers and 8% of occasional smokers) and 46% were non-smokers (Table 1).

Table 1 Prevalence of tobacco smoking among presumptive TB patients

Tobacco smokers	Number	Percentage
Current smokers	217	54.0
Non smokers	183	46.0

Table 2 shows a half of presumptive TB patients were adults aged 18-40 years old, farmers or daily labors, and harmful alcohol drinkers and had low education (no formal education or primary school). A majority of them were male (67.2%) and married (61.7%), and only 24.0% was rich persons who earned more than 280,000 Kyat (400 USD) per month. Nearly all participants were Myanmar ethnicity and Buddhist. About 46% had a history of harmful alcohol drinking in the last 12 months.

Table 2 Distribution of respondents by socio-demographic characteristics

Socio-demographic Factors	Number	Percentage
Age (years)		
18-40	203	50.8
41-60	151	37.8
>60	46	11.4
Sex		
Male	269	67.2
Female	131	32.8
Occupation		
Farmer/ Daily Labour/ Others	210	52.5
Government/Company staffs	77	19.3
Self-Employee	113	28.2
Household Income (1,000 Kyats per month) [1)]		
Low (<140)	131	32.8
Middle (140 -280)	173	43.2
High (>280)	96	24.0
Education		
No Formal Education or Primary School	184	46.0
Middle or High School	173	43.2
College or Higher education	43	10.8
Ethnicity		
Myanmar	378	94.5
Kayin	16	4.0
Others	6	1.5
Religion		
Buddhist	382	95.5
Others	18	4.5
Marital Status		
Single	73	18.3
Married	247	61.7
Divorced/Widowed/Separated	80	20.0
Harmful alcohol drinking in last 12 months		
Yes	180	45.5
No	220	55.5

[1)] An average currency rate between Kyat and US$ is 1US$=1,400kyats

Table 3 shows 54.4% of participants had 4-10 peer smokers among presumptive TB patients and the majority of peer smokers (79.0%) were daily smokers. Patients having 1-3 smoker in their family were 62.8% and 75.2% of the smokers in their family were daily smokers. A half of participants got cigarettes from buying from a shop (47.2%) and from peers and friends (33.3%). Majority of participants perceived that they can afford to buy cigarettes and easily accessible to buy cigarette and its products.

Table 3 Distribution of respondents by socio-environmental factors

Socio-demographic Factors	Number	Percentage
Number of peer smokers		
None	58	15.8
1-3	109	29.8
4-10	199	54.4
Frequency of smoking of peers		
Never/used to smoke, but not now	63	15.8
1-3 times per week	21	5.2
Every day	316	79.0
Number of family members smoking		
None	56	14.0
1-3	252	62.8
4-10	93	23.2
Frequency of smoking of family members		
Never/used to smoke, but not now	63	15.8
Sometimes	36	9.0
Every day	301	75.2
Source of tobacco		
Usually buy myself from a shop	188	47.2
Usually from my friends	133	33.3
From family members (including parents)	78	19.5
Perceived affordability		
Yes	350	87.5
No	50	12.5

As shown in Table 4, 91.2% of participants smoked in mental distress, such as anxiety, depression, jobless, frustration with family and about two third of participants reported that their health status was poor and or very poor (69.0%). About 16.0% had poor knowledge about tobacco smoking hazards, while 43.5% had good knowledge.

Table 4 Distribution of respondents by phychosocial factors

Socio-demographic Factors	Number	Percentage
Mental Distress [1)]		
Yes	365	91.2
No	35	8.8
Self-reported Health Status		
Very Poor/Poor	276	69.0
Fair/Good/Excellent	124	31.0
Knowledge related to smoking		
Low (<2 scores)	64	16.0
Middle (2-4 scores)	162	40.5
High (>4 scores)	174	43.5

[1)] For example, Anxiety, Depression, Jobless, frustration with Family

Table 5 shows significant association of tobacco smoking with independent variables among presumptive TB patients. Those aged 40 years and higher, male sex, with low or middle education level, and middle tertile of average monthly income, being single/separated/divorced/widowed and with experience of harmful alcohol drinking were associated with tobacco smoking among PTB patients. There was no significant association between occupation, ethnicity, and religion and tobacco smoking.

The results of socio-environmental factors were significantly associated with tobacco smoking (Table 6). Higher number and smoking frequency of peer and family members, and easily getting tobacco products from parents or peers were associated with tobacco smoking. However, perception that tobacco products was affordable was not significant associated with smoking status. In addition, presumptive TB patients smoked in any mental distresses. With better knowledge about smoking hazards were significantly associated with tobacco smoking among presumptive TB patients (Table 7). However, self-reported health status were not found to be significant associated with smoking status.

Table 5 The association between socio-demographic factors and tobacco smoking

Socio-demographic factors	Current Smoker		Non-Smoker		Crude OR	(95% CI)	P-value
	n	%	n	%			
Age (years)							
18-40	34	38.6	54	61.4	1		
41-60	92	60.1	61	39.8	2.4	(1.40-4.10)	**0.001**
>60	90	56.6	69	43.3	2.07	(1.22-3.53)	**0.007**
Sex							
Male	193	71.7	76	28.3	11.92	(7.07-20.11)	**<0.001**
Female	23	17.6	108	82.4	1		
Household income (1,000 Kyats per month) [1)]							
Low (<140)	59	45.1	72	54.9	1		
Middle (140-280)	106	61.3	67	38.7	1.91	(1.18-3.11)	**0.009**
High (>280)	51	53.2	45	46.8	1.48	(0.84-2.59)	0.176
Education							
Primary School -	105	57.1	79	42.9	4.39	(2.04-9.43)	**<0.001**
Middle/High School	101	58.4	72	41.6	4.63	(2.15-9.99)	**<0.001**
College or Higher	10	23.2	33	76.8	1		
Marital status							
Married	120	48.6	127	51.4	1		
Others [2)]	97	63.4	56	36.6	1.83	(1.21-2.77)	**0.004**
Harmful drinking last 12 months							
Yes	138	76.7	42	23.3	5.98	(3.84-9.31)	**<0.001**
No	78	35.5	142	64.5	1		

[1)] Average currency between 1US$ and Myanmar Kyat is 1US$=1400Myanmar Kyats.

[2)] Including single, separated, divorced and widowed

Table 6 The association between socio-environmental factors and tobacco smoking

Variables	Current Smoker		Non-Smoker		Crude OR	(95% CI)	P-value
	n	%	n	%			
Number of peer smokers							
0	13	22.4	45	77.6	1		
1-3	60	55.0	49	45.0	4.24	(2.06-8.74)	**<0.001**
4-10	118	59.2	81	40.8	5.04	(2.56-9.94)	**<0.001**
Frequency of smoking of peers							
Never/used to smoke but not now	14	22.2	49	77.8	1		
Sometimes	10	47.6	11	52.4	3.18	(1.12-9.02)	**0.030**
Everyday	192	60.8	124	39.2	5.42	(2.87-10.2)	**<0.001**
Number of family member smoking							
0	16	28.6	40	71.4	1		
1-3	151	60.2	100	39.8	3.77	(2.01-7.11)	**<0.001**
4-10	49	52.7	44	47.3	2.78	(1.37-5.65)	**0.005**
Frequency of smoking of family members							
Never/used to smoke but not now	17	27.0	46	73.0	1		
Sometimes	27	75.0	9	25.0	8.12	(3.18-20.73)	**<0.001**
Everyday	172	57.1	129	42.9	3.61	(1.98-6.58)	**<0.001**
Source of tobacco							
Buy myself from a shop	85	45.2	103	54.8	1		
Usually from my friends	83	62.4	50	37.6	2.01	(1.28-3.17)	**0.003**
From family members	48	61.5	30	38.5	1.94	(1.13-3.32)	**0.016**
Perceived affordability							
Yes	191	54.6	159	45.4	1.20	(0.67-2.17)	**0.519**
No	25	50.0	25	50.0	1		

Table 7 The association between psychosocial factors and tobacco smoking

Psychosocial factors	Current Smoker		Non-Smoker		Crude OR	(95% CI)	P-value
	n	%	n	%			
Mental distress [1)]							
Yes	205	56.2	160	43.8	2.80	(1.33-5.88)	**0.007**
No	11	31.4	24	68.6	1		
Self-reported health status							
Fair/good/excellent	65	52.4	59	47.6	1		
Poor/very poor	151	54.7	125	45.3	1.09	(0.72-1.68)	0.671
Knowledge about smoking hazards							
Low (<2 scores)	53	82.8	11	17.2	12.65	(6.09-26.23)	**<0.001**
Moderate (2-4 scores)	116	71.6	46	28.4	6.62	(4.11-10.66)	**<0.001**
High (>4 scores)	48	27.6	126	72.4	1		

[1)] Anxiety/Depression/Jobless/Frustration with family

Multiple logistic regression was used in order to determine significant predictors for tobacco smoking among presumptive TB patients (Table 8), male sex (Adj OR=4.65, 95%CI= 2.14-10.12), education levels (Adj OR=3.89, 95%CI= 1.19-12.65 for middle or high school level and Adj OR=4.39, 95%CI=1.22-15.77 for primary school level or less), middle monthly household income (Adj OR=3.05, 95%CI=1.42-6.59), being single/separated/divorced/widowed (Adj OR=1.97, 95%CI=1.01-3.81), harmful alcohol drinking (Adj OR=3.42, 95%CI=1.77-6.60), mental distress (Adj OR=2.97, 95%CI=1.12-7.89), and knowledge level related to tobacco smoking hazards (Adj OR=4.94, 95%CI=2.49-9.76 for middle level, and Adj OR=6.50, 95%CI=2.45-17.24 for low level) were associated with current tobacco smoking among presumptive TB patients.

Table 8 Multiple logistic regression for tobacco smoking among presumptive TB patients

Variables	Adj OR	95%CI	P vlaue
Sex			
Male	4.65	(2.14-10.12)	**<0.001**
Female	1		
Household income			
Low	1		
Middle	3.05	(1.42-6.54)	**0.004**
High	2.04	(0.82-5.06)	0.124
Education level			
Primary School	4.39	(1.22-15.77)	**0.024**
Middle or High	3.89	(1.19-12.65)	**0.024**
College or University	1		
Marital Status			
Married	1		
Being single/separated/divorces/ widowed	1.97	(1.01-3.81)	**0.046**
Harmful drinking in last 12 months			
Yes	3.42	(1.77-6.60)	**<0.001**
No	1		
Mental Distress			
Yes	2.97	(1.12-7.89)	**0.029**
No	1		
Knowledge			
Low(<2 scores)	6.50	(2.45-17.24)	**<0.001**
Middle (2-4 scores)	4.94	(2.49-9.76)	**<0.001**
High (>4 scores)	1		

Discussion

This study showed high prevalence of current tobacco smokers (54%) among presumptive TB patients who attended to TB department, Taungoo General Hospital, Myanmar. Factors related to current tobacco smoking were male sex, low education level, harmful alcohol drinker, mental distress, poor knowledge about tobacco smoking risk. This could help policy makers to identify people at risk of the negative health outcomes of double burden of the diseases, and establish the need for tobacco cessation services with integrated alcohol intervention in health facilities as a component part of TB program in Myanmar.

Community based tobacco survey in 2014 in Myanmar, conducted based on Global Adult Tobacco Survey (GATS)(2009) showed that current smokers was 45 % among men and only 8% among female[23]. Smoking prevalence among either presumptive TB or TB patients could be higher in many countries. Some studies supported it by showing higher prevalence of tobacco smokers: 54.6% of current smokers among TB patients in a case-control study in China[24] and 56 % of smokers among people with active TB in South Africa[25]. Another similar study in India also reported that prevalence of tobacco use among presumptive TB patients was 42%[7]. Moreover, the positive association of tobacco smoking in either presumptive TB or TB patients is also found in many studies. A study in rural India found that 81.5 % of TB cases had previously smoked at some time in their life[26] and in Georgia, the prevalence of current smokers among the diagnoses of TB represents 46 %[27]. In addition, 18% of presumptive TB patients currently smoking were represented with smear positive Pulmonary TB. It may support that tobacco smokers had greater chance to get TB infection because of tobacco smoking[7]. A study in newly diagnosed pulmonary TB patients with high rate of Human Immunodeficiency Virus (HIV) in South Africa showed also high prevalence, as 38% of patients were current tobacco smokers[28].

These studies mentioned above also indicated that men were associated with current smoking not only in general population but also in presumptive TB patients and new diagnosed TB patients. The problems still need to be considered as a major global health problem in all over the world. In the context of Myanmar culture, smoking has been socially accepted since early times. Men are more likely to smoke, in accordance with a Mexican study[29], explaining that men are less responsive to health promotion, less information about health consequences of smoking and less access to cessation services[29]. People with lower socio-economic status were more likely to live in an environment living with many family members or neighbors and to believe that smoking may make much easier to socialize with others[14]. As those having mental distress and living alone may be more likely to smoke, it is assumed that married persons were less likely to smoke than those living alone, such as single, widow, separated or divorced due to loneliness.

Meanwhile, females were less likely to smoke than males because community did not allow and respect to female smokers. Nevertheless, in some rural areas of Myanmar, it is not difficult to find women smoke cigarettes and other tobacco smoking products, because they wanted to relax their stress due to hard workload and reduce their body weight[30]. In addition, Myanmar ladies believe that smoking can

freshen the mouth and minor smoking do not harass to their health. Another one is cultural influence on smoking: in Myanmar, there was a long practice of habit for providing cheroots or cigarettes to their guests at special events, such as wedding and donation ceremonies. In addition, the social environment and attitudes of family, friends, and co-workers toward smoking within the Myanmar culture may influence on smoking as shown in a Myanmar migrant worker study that peer and employer smoking was strongly associated with cigarette smoking behavior[31].

In consistent with other studies, people in low socioeconomic status, such as low education and monthly household income were more likely to smoke. Current tobacco smoking was more prevalent in low education level, such as high school level or less education groups rather than those with college or higher education in present study. The study was consistent with a study in Israel showing that persons with lower education level were more likely to be smokers because of lack of awareness on health hazards of tobacco smoking, lack of social supportive environment for smoking cessation[32]. A Mongolian study showed that participants had little knowledge on harmful effect of tobacco use and lack of tobacco related health education for them, particularly in low education group[15]. It may support our study that only 33% of presumptive TB patients had good level of knowledge about risk of tobacco smoking hazards and poor knowledge level is significantly associated with current smoking. With regard to monthly household income, respondents with middle level of household income group was more likely to smoke than those with low and high income groups in our study. A study in India showed that highest prevalence of tobacco use among Indians were medium wealth quartile as our study did. Also the study showed decreasing smoking prevalence was found in high income and educated persons[33].

In addition, participants having many peers or family members currently smoking were more likely to smoke in our study. This study was similar in US National Tobacco quitline survey 2012-2013 showing that young adults can get more chance to smoke and wanted to try smoking at once because of peer smokers around them[34]. In light of influence of family members smoking, the finding was consistent with a study in Korea showed that family members as well as peers encourage to smoke and provide an environment to feel familiar with smoking and it was apparent particularly in those participants living with smoking parents and family members[35]. In addition, source of tobacco products was significantly associated with tobacco smoking. In the study, more than two third of smokers (62.4%) got cigarettes and tobacco products from their friends and family members.

This present study also showed that current tobacco smokers were more likely to be harmful alcohol drinkers. The study was consistent with a study in Spain showing that hazardous alcohol drinking causes greater chance to relapse smoking and alcohol consumption reduces capacity to remain tobacco abstinence[13]. Thus, integrated alcohol intervention with smoking cessation can be considered in interventions in health facilities.

There were some limitations in this present study to be acknowledged. The data were collected purposively at a tertiary hospital in Taungoo Township, Myanmar and the result did not represent as a whole population in the area. In addition, as the information

was gained from self-report, it may be subject to recall bias. Due to the nature of cross-sectional study, our findings could not measure causal effect relationship between independent variables and tobacco smoking. Despite the limitation of the study, this study may show the smoking profile among presumptive TB patients in a tertiary hospital, which may help to develop interventions in health facilities in Myanmar.

Recommendations

The study showed tobacco use among presumptive TB patients was high particularly in those being male, low education and household income, being single/separated/divorced/widowed, harmful alcohol drinking, with mental distress and poor knowledge level. Knowledge on harmful effect of smoking was inversely associated with current tobacco smoking. It led to a need of health education and counselling program on tobacco prevention and cessation can be a key factor. Despite no significant association of influence of family and peers in the study, a significant bivariate association may lead to a need of socio-environmental support for tobacco cessation. Thus, the programs should target on not only presumptive TB patients but also patients' attendances (family members and friends). This could help policy makers to identify people at risk of the negative impact on tobacco and TB outcomes and need to establish integrated alcohol intervention program for presumptive TB patients in health facilities as a component part of TB program in Myanmar. This will help not only reduction for TB but also prevention of morbidities caused by tobacco use.

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