

## **A descriptive study of gambling practices and problem gambling among internal migrants in Muse, Northern Shan, Myanmar**

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### **ABSTRACT**

Due to rapid economic growth in China, many gambling sites have emerged along the neighboring countries, including Myanmar, which place migrants at risk of developing gambling problems. This study aimed at identifying: i) types of gambling, ii) gambling involvement and intensity, and iii) the associations with problem gambling. A community-based cross-sectional study was conducted in Muse, Myanmar. A convenience sample of 273 internal migrants (18–49 years) filled a self-administered questionnaire. Chi-square tests and multiple logistic regression explored associations between gambling practices and problem gambling. Among the categories of gambling, the popular gambling types were lottery games (Aung Bar Lay, Thone-Lone and Nhith-Lone) and card games, as well as the use of Electronic Gambling Machines (EGMs). An average number of past-year gambling types involved and of gambling types engaged in regularly were 1.61 (SD=0.95) and 1.22 (SD=0.70), respectively. In association with PG, Nhith-Lone, EGMs, cards, and dice games were strongly associated among the gambling types. Those with PG had a higher number of involvement by past-year gambling types (1.92 vs. 1.18 for no PG) and spent 5 times higher amount of money on gambling. In conclusion, this study showed that types of gambling, such as Nhith-Lone, cards and dice games and higher involvement and intensity were associated with problem gambling. The findings provide new and important insights into gambling behavior among internal migrant workers in the border area with China and highlight the need for culturally specific preventive measures for the Myanmar population, with preference to gambling types.

Keywords: types of gambling, gambling involvement, gambling intensity, internal migrant workers, Myanmar

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### **INTRODUCTION**

Due to harmful negative consequences of heavy gambling in our society,<sup>1,2</sup> problem gambling has been recognized in many countries. The focus on gambling behaviour and gambling related harm has intensified as an area of public health interest.<sup>3</sup> Although many forms of gambling are legally restricted in Myanmar, gambling is available and accessible in Muse, a Myanmar-China

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border town, which hosts about 70% of the China-Myanmar border trade since 1988. Due to rapid economic growth in China, many casinos have emerged along the neighboring countries, including Myanmar and gambling has flourished in the trade zone cities on both sides of the border. As Myanmar workers in Muse with authorized passes travel back and forth between the countries, they gain access to gambling sites like casinos around China. In addition, there are many local gambling sites around Myanmar. Increased access to gambling may lead to increase in gambling<sup>4</sup> which puts them at a greater risk of problem gambling.<sup>5</sup>

Gambling is in various forms and they differ in the range of odds of winning, physical gambling locations and games involving personal skills.<sup>6</sup> The preferences for each gambling type, therefore, differ between population groups and between countries.<sup>7,8</sup> In addition, the various types of gambling are different in features and gambling experiences.<sup>9</sup> For examples, while lotteries give a chance of obtaining big amount of money by putting a small amount of money to win and do not require any special skills, football match betting involves a perceived or actual elements of skill.<sup>10</sup> Electronic Gambling Machines (EGMs), utilizing sophisticated techniques, are designed to maximize spending by pursuing rapid succession repeatedly with small amount of money and occupying prolonged play sessions by losses disguised as win and near miss.<sup>10</sup> Based on addiction theories, some forms of gambling, in particular EGMs, are continuous games with a high reward frequency and they are more likely to cause harm than other forms.<sup>10-12</sup> An exploration of whether some forms of gambling are more harmful and risky than others is useful for planning preventive and treatment interventions.

On the other hand, several researches suggest that involvement in multiple forms of gambling is a much more important factor than the individual type of games.<sup>13-18</sup> The more the various types of gambling, the more people are attracted to some types of gambling, take part frequently and promote the risk of evolving gambling problems.<sup>19</sup> A 15-year longitudinal study among young adults aged 15 to 30 years found that 8% of the people who were highly involved in gambling, had connection with problem gambling.<sup>20</sup> Many studies on gambling practices, as regards gambling types and gambling involvement and intensity have been conducted mostly in western countries. There is a paucity of evidence in Southeast Asia including Myanmar. Therefore, this study aimed to identify gambling types, degree of involvement and intensity and to examine the associations with problem gambling among the internal migrant workers in Muse, Myanmar.

## MATERIALS AND METHODS

### *Study design and participants*

A population-based cross-sectional study was conducted from April to May 2018 in Muse, a Myanmar-China border city, Myanmar. The inclusion criteria were Myanmar internal migrant workers who had lived in Muse for at least three months and those aged between 18–49 years. A total of 273 internal migrants were recruited using non-probability convenient sampling. First, the research team randomly selected four out of 10 wards in Muse, namely South, Homon, Kyel Gau, and Hona. The leaders of the village/workplace conveniently selected in each ward were invited and the study objectives were explained to them. They introduced internal migrants meeting the inclusion criteria. Since informed consent was obtained from all participants after explanation of the study objectives and assurance of the confidentiality of their identity and assurance that choosing not to participate had no disadvantage in anyway. They were asked to complete a self-administered questionnaire. Prior to the study, ethical approval was obtained from a Mahidol University Ethical Committee in Thailand (Approval No: 2018/02-043) and from the Defence Services Medical Research Center, Nay Pyi Taw in Myanmar (Document No: IRB/2018/7). All

data were treated anonymously with study identification number.

### *Measures of variables*

A self-administered questionnaire was developed from literature review and translated into Myanmar language. The various types of gambling, which are popular in Myanmar were drawn from local and online sources, such as newspapers. Types of gambling in the past year were presented as follow: i) Aung Bar Lay (a monthly official state lottery); ii) Nhit-Lone (an illegal lottery, in which winner numbers were taken from the last two digits of Thai stock exchange numbers for each day); iii) Thone-Lone (an illegal lottery, in which winner numbers were taken from the last three digits of Thai state lottery biweekly); iv) cockfight; v) EGMs (for example, slots, fruit machines, catching fish machines imported from China, mostly placed in casino and gambling sites); vi) dice games (a dice with four or six animal pictures rolled by hand and covered with cup and the animal picture on upper surface of the dice is the winning bet picture); vii) card games; viii) football match betting. Due to limited internet connection in the border area, online games may not be popular and thus were not included in the study.

Gambling involvement and intensity were adopted from a previous study.<sup>10</sup> Involvement in gambling was measured with the number of gambling types at least monthly in the previous year. An individual taking part in many forms of gambling is defined as high involvement.<sup>10</sup> Gambling intensity was measured based on the amount of money spent and hours of time spent on gambling in the last 30 days. The problem gambling was measured by the 9-item Problem Gambling Severity Index (PGSI) with range of scores 0–27.<sup>21</sup> Scores of 0–2 as no or low risk for problem gambling, 3–7 as moderate risk, and 8 and above as high risk for problem gambling or problem gamblers.

Socio-demographic variables included sex (male or female), age (18–24 years, 25–30, or 31–49), employment status (unemployed, daily manual labors or monthly paid employees, self-employed), and education (no education, primary education, middle school, high school, or higher).

### *Data analysis*

Descriptive statistics were used to describe the proportion or mean of the general characteristics and types of gambling and gambling involvement as well as the intensity of study by participants. Comparison of gambling involvement and intensity by problem gambling levels were assessed using Student t-test for continuous variables and Chi-square tests for categorical variables. Furthermore, logistic regression was performed to estimate crude odds ratio (COR) and adjusted odds ratio (AOR) and 95% confidence interval (CI) was done after adjustment for socio-demographic variables. Spearman's correlation coefficients were used to measure the strength and direction of association between gambling involvement and intensity. Data were entered and analyzed using SPSS version 22.0.

## RESULTS

About two third of the study participants were male and aged 30 or less (Table 1). About half had high school or higher education and were daily manual or unemployed workers.

In Table 2, the most popular types of gambling were lotteries, such as Aung Bar Lay (31.5%), Thone-Lone (26.0%), and Nhit-Lone (24.5%) and other types, such as card games (27.1%) and EGMs (25.6%). Almost in all types of gambling, except for Aung Bar Lay were men higher than women. For gambling involvement and intensity, an average number of gambling types

**Table 1 General characteristics of study population**

	Total		Men		Women	
	n	(%)	n	(%)	n	(%)
	273	(100.0)	205	(75.1)	68	(24.9)
<b>Age</b>						
18–24	96	(35.2)	70	(34.2)	26	(38.2)
25–30	96	(35.2)	74	(36.1)	22	(32.4)
31–49	81	(29.7)	61	(29.8)	20	(29.4)
<b>Education level</b>						
No education/primary school	50	(18.4)	38	(18.6)	12	(17.7)
Middle School	89	(32.7)	68	(33.3)	21	(30.9)
High School or higher	133	(48.9)	98	(48.0)	35	(51.5)
<b>Employment Status</b>						
Unemployed/daily manual workers	150	(55.0)	123	(60.0)	27	(39.7)
Monthly paid employed/self-employed	123	(45.1)	82	(40.0)	41	(60.3)

**Table 2 Number and percentage of types of gambling, gambling involvement and intensity**

	Total		Men		Women	
	n	(%)	n	(%)	n	(%)
<b>Type of gambling last 12 months</b>						
Aung Bar Lay	86	(31.5)	55	(26.8)	31	(45.6)
Nhit-Lone	67	(24.5)	53	(25.9)	14	(20.6)
Thone-Lone	71	(26.0)	63	(30.7)	8	(11.8)
Cockfight	31	(11.4)	31	(15.1)	0	(0.0)
EGMs	70	(25.6)	55	(26.8)	15	(22.1)
Dice games	25	(9.2)	23	(11.2)	2	(2.9)
Card Games	74	(27.1)	64	(31.2)	10	(14.7)
Football Match betting	39	(14.3)	37	(18.1)	2	(2.9)
<b>Gambling involvement</b>						
Number of gambling types in last year (Mean±SD)		1.61±0.95		1.78±0.99		1.10±0.60
0	7	(2.6)	3	(1.5)	4	(5.9)
1	157	(57.5)	100	(48.8)	57	(83.8)
2	54	(19.8)	50	(24.4)	4	(5.9)
3+	55	(20.2)	52	(25.4)	3	(4.4)
Number of gambling types at least monthly past year (Mean±SD)		1.22±0.70		1.29±0.77		0.99±0.32
0	7	(2.6)	3	(1.5)	4	(5.9)
1	219	(80.2)	158	(77.1)	61	(89.7)
2	36	(13.2)	33	(16.1)	3	(4.4)
3+	11	(4.0)	11	(5.4)	0	(0.0)
<b>Gambling intensity</b>						
Amount of money spent on gambling last 30 days (MMK) <sup>1)</sup> (Mean ± SD)		195,709±746,544		153,881±306,557		321,809±1,398,198
1st tertile (0–30,000)	100	(36.6)	60	(29.3)	40	(58.8)
2nd tertile (31,000–98,000)	77	(28.2)	67	(32.7)	10	(14.7)
3rd tertile (99,000–10,000,000)	96	(35.2)	78	(38.1)	18	(26.5)
Hours of time spent on gambling last 30 days (Mean ± SD)		43.45±62.0		48.7±65.3		27.6±47.9
1st tertile (0–6)	91	(33.3)	51	(24.9)	40	(58.8)
2nd tertile (7–48)	94	(34.4)	80	(39.0)	14	(20.6)
3rd tertile (49–480)	88	(32.2)	74	(36.1)	14	(20.6)

<sup>1)</sup> USD approximately equal to 1,500 MMK

involved last year and at least monthly were 1.61 (SD=0.95) and 1.22 (SD=0.70), respectively (1.78 (SD=0.99) and 1.29 (SD=0.77) for men and 1.10 (SD=0.60) and 0.99 (SD=0.32) for women). An average amount of money and hours on gambling during the last 30 days were 195,709 MMK (being approximately 130 USD, SD=746,544) and 43.5 hours (SD=61.98), respectively. Men spent more time (48.7 (SD=65.3) for men and 27.6 (SD=47.9) for women), while women spent more money than men (153,881 MMK (SD=306,557) for men and 321,809 MMK (SD=1,398,198) for women).

Table 3 shows that the correlations between previous-year gambling involvement and gambling intensity in money or hours spent were not strongly associated (0.381 and 0.358, respectively,  $p < 0.0001$ ). Similar correlation was found even when gambling involvement was measured as the number of forms engaged in regularly (0.355 and 0.392, respectively,  $p < 0.0001$ ).

Table 4 shows the associations between types of gambling, gambling involvement and intensity and problem gambling. For the types of gambling, while those who played Aung Bar Lay was inversely associated with problem gambling, compared to those who did not, Nhit-Lone, EGMs, dice games, and card games were 2–4.5 times more likely to be associated with problem gambling and the associations remained even after adjustment for the socio-economic factors (AOR=3.05, 95% CI=1.56-5.97, AOR=5.01, 95% CI=2.42-10.4, AOR=4.32, 95% CI=1.35-13.8, AOR=2.27, 95% CI=1.21–4.26, respectively).

The past-year gambling involvement and the number of gambling types engaged in regularly were higher in problem gamblers, compared with their counterpart (1.92 and 1.33 vs 1.18 and 1.06, respectively,  $p < 0.001$ ). However, after adjustment for the socio-economic factors, only the past-year gambling involvement remained significant (AOR=4.65, 95% CI=2.50–8.65). Regarding gambling intensity, money and hours spent on gambling among problem gamblers were 5 times and 2 times, respectively higher than those of their counterpart ( $p < 0.01$ ). Even when analyzing by tertiles of intensity, the association with problem gambling remained significant (for amount of money spent on gambling, AOR=3.90 (1.98–7.69) for 2nd tertile and 8.43 (4.18–17.0) for 3rd tertile and for hours spent on gambling, 4.12 (2.09–8.13) and 11.2 (5.22–23.9), respectively).

## DISCUSSION

To the best of our knowledge, this is the first study to examine gambling behavior among

**Table 3 Correlation between gambling involvement and intensity**

	Number of gambling types in Last year	Number of gambling types at least monthly past year	Amount of money spent on gambling last 30 days	Hours of time spent on gambling last 30 days
Number of gambling types in Last year	1.000			
Number of gambling types at least monthly past year	<b>0.542***</b>	1.000		
Amount of money spent on gambling last 30 days	<b>0.381***</b>	<b>0.355***</b>	1.000	
Hours of time spent on gambling last 30 days	<b>0.358***</b>	<b>0.392***</b>	<b>0.636***</b>	1.000

\*\*\*. Correlation is significant at the 0.001 level (2-tailed).

**Table 4 Association of types of gambling and gambling involvement and intensity with problem gambling**

	No (<8)		Yes (8+)		p-value	COR (95% CI)	AOR (95% CI) <sup>1)</sup>
	n	(%)	n	(%)			
	114	(41.8)	159	(58.2)			
<b>Type of gambling</b>							
Aung Bar Lay	46	(40.4)	40	(25.2)	<b>0.0077</b>	<b>0.50 (0.30–0.83)</b>	0.58 (0.32–1.03)
Nhit-Lone	15	(13.2)	52	(32.7)	<b>0.0002</b>	<b>3.21 (1.70–6.06)</b>	<b>3.05 (1.56–5.97)</b>
Thone-Lone	25	(21.9)	46	(28.9)	0.1935	1.45 (0.83–2.54)	0.84 (0.45–1.59)
Cockfight	11	(9.7)	20	(12.6)	0.4518	1.35 (0.62–2.94)	1.02 (0.44–2.37)
EGM	13	(11.4)	57	(35.9)	<b>&lt;0.0001</b>	<b>4.34 (2.24–8.42)</b>	<b>5.01 (2.42–10.4)</b>
Dice games	4	(3.5)	21	(13.2)	<b>0.0061</b>	<b>4.18 (1.40–12.5)</b>	<b>4.32 (1.35–13.8)</b>
Card Games	19	(16.7)	55	(34.6)	<b>0.0010</b>	<b>2.64 (1.46–4.78)</b>	<b>2.27 (1.21–4.26)</b>
Football Match betting	11	(9.7)	28	(17.6)	0.0638	2.00 (0.95–4.21)	1.77 (0.79–3.93)
<b>Gambling involvement</b>							
Number of gambling types in last year	1.18 ± 0.61 <sup>3)</sup>		1.92 ± 1.03		<b>&lt;0.0001</b>		
0–1	93	(81.6)	71	(44.7)	<b>&lt;0.0001</b>	1	1
2+	21	(18.4)	88	(55.4)		<b>5.49 (3.11–9.68)</b>	<b>4.65 (2.50–8.65)</b>
Number of gambling types at least monthly past year	1.06 ± 0.47		1.33 ± 0.81		<b>0.0007</b>		
0–1	102	(89.5)	124	(78.0)	<b>0.0132</b>	1	1
2+	12	(10.5)	35	(22.0)		<b>2.40 (1.18–4.86)</b>	2.04 (0.96–4.30)
<b>Gambling intensity last 30 days</b>							
Money spent on gambling	57,649 ± 91,665		294,696 ± 964,277		<b>0.0024</b>		
1st tertile (0–30,000 MMK <sup>2)</sup> )	70	(61.4)	30	(18.9)	<b>&lt;0.0001</b>	1	1
2nd tertile (30,001–98,000MMK)	26	(22.8)	51	(32.1)		<b>4.58 (2.42–8.66)</b>	<b>3.90 (1.98–7.69)</b>
3rd tertile (98,001–10,000,000MMK)	18	(15.8)	78	(49.1)		<b>10.1 (5.19–19.7)</b>	<b>8.43 (4.18–17.0)</b>
Hours of time spent on gambling	20.6 ± 34.3		59.8 ± 71.6		<b>&lt;0.0001</b>		
1st tertile (0–6)	67	(58.8)	24	(15.1)	<b>&lt;0.0001</b>	1	1
2nd tertile (7–48)	31	(27.2)	63	(39.6)		<b>5.67 (3.01–10.7)</b>	<b>4.12 (2.09–8.13)</b>
3rd tertile (49–480)	16	(14.0)	72	(45.3)		<b>12.6 (6.15–25.7)</b>	<b>11.2 (5.22–23.9)</b>

<sup>1)</sup>Adjusted odds ratios after controlling for age group, sex, education, and employment status

<sup>2)</sup>1 USD approximately equal to 1,500 MMK

<sup>3)</sup>Mean±SD

internal migrant workers in a Myanmar-China border area in a Southeast Asian county where gambling is popular despite its illegality. The popular forms of gambling related to greater risk of problem gambling were Nhit-Lone, EGMs, dice, and card games. The past-year gambling involvement (number of gambling types involved) and intensity (amount of money and hours spent on gambling last month) were strongly associated with problem gambling even after adjustment based on socio-economic factors.

Although, types of gambling have a similar basic, for example, the chance of getting winning amount than the bet value. The most popular types of gambling were lottery-type games in this current study, in line with a neighboring country, Thailand (69.5%).<sup>22</sup> This current study showed that the top three popular lottery games are Aung Bar Lay (31.5%), Thone-Lone (26.0%), and Nhit-Lone (24.5%). The Aung Bar Lay, an official government state lottery, is widely available and easily accessible due to affordable range of prices in Myanmar nationwide. Thus, women

played the most (45.6%). It was supported by Swedish<sup>23</sup> and Canadian studies<sup>24</sup> which revealed that males are likely to be involved in strategic type of gambling (skill-based gambling), while female are likely to engage in the non-strategic type (chance-based forms of gambling). Except for Aung Bar Lay, all the other gambling types are illegal in Myanmar. The other types of illegal lottery, such as Nhit-Lone and Thone-Lone are also popular and widespread in Myanmar. People who regularly take part in specific types of gambling can be at risk of developing problem gambling.<sup>8,25</sup> Among the local lotteries, Nhit-Lone was strongly associated with problem gambling. It may be explained that while all the winning numbers for Aung Bar Lay and Thone-Lone are chosen in a single day every month and every two weeks, respectively, the winning number for Nhit-Lone is announced 5 days a week, which place Nhit-Lone players at risk of problem gambling. The top three games which are more likely associated with problem gambling were card games, dice (animal betting), and EGMs. Although, the features of card games and dice games (e.g. animal betting) are varied between countries, they are commonly played in Asia, as a recreational activity in exchange for money. They mostly exchange mental skill for money. In particular, card games were the second popularly used game and had a strong association with problem gambling in the current study, which is consistent with a previous study.<sup>13</sup> Since most of the migrant workers are daily manual laborers, they gather together during their free time and play cards. This frequent involvement could place people at risk of developing problem gambling, due to familiarity with gambling as entertainment, and their likelihood of socializing with other gamblers.<sup>26</sup> In terms of EGMs, it stood in the third place among popular types of gambling in this study as Myanmar people can play in casinos and gambling sites in China side, though EGMs are mostly used in casinos, where residents are prohibited from entering casinos in Myanmar. The strong association with problem gambling can be explained by that EGMs who make people involve in lengthy sessions of play by pursuing rapid succession repeatedly with small amount of money.<sup>10</sup> It was reported that continuous types of gambling with big reward often (e.g EGM) are more associated with problem gambling compared to the discontinuous types of gambling and slow games (e.g monthly and weekly lotteries).<sup>27</sup> This study pointed out that legal lotteries are relatively less harmful, but other types of gambling, such as Nhit-Lone, EGMs, dice games, and card games can have negative consequences through regular and lengthy sessions of participation due to the nature of continuity and element of skill or perceived skill involvement.<sup>25,28,29</sup>

This study showed that the average number of forms of gambling in which problem gamblers participated was 1.92 during the last year and 1.3 on a regular base (median=1). In addition, those who involved more than one type of gambling were about 40% during the last year and about 20% during the previous month. Only 2.6% reported no participation. Furthermore, the average amount of money spent on gambling was 195,709 MMK [approximately 130 USD], which is higher than the general earning of daily manual laborers (9 USD per day) and around 45 hours were spent on gambling. This may indicate that internal migrant workers in the border area may have negative consequences due to excessive gambling.

In line with previous studies, high involvement in gambling<sup>10,17-19,30</sup> were closely associated with problem gambling. The average money spent on gambling last year was 5 times higher among problem gamblers, compared to their counterpart (294,696 MMK [approximately 196 USD] vs 57,649 MMK [approximately 38 USD]) and the average hours on gambling was 3 times higher among problem gamblers (60 hours vs. 20.6 hours for no problem gamblers, respectively), which is in consistency with previous studies.<sup>31,32</sup> This current study also showed a significant but weaker correlation between past-year involvement and intensity (0.38 for money spent on gambling and 0.36 for hours spent on gambling) than those in a Swedish study (0.54 and 0.61, respectively).<sup>10</sup> A Thai study suggested that there is a mediating effect of gambling intensity on the relationship

between gambler's belief and problem gambling.<sup>32</sup> Thus, it is postulated that an association of involvement with problem gambling might be caused or strengthened by the intensity, which is an essential aspect of problem gambling,<sup>10</sup> as high intensity leads to increasing harms from gambling.<sup>31</sup> Further study is needed to identify the negative consequences of gambling on the functioning of family and intimate relationships between individuals, family and community.

There are a number of limitations worthy of consideration. As the study sample (n=273) is relatively small from non-probability sampling, it did not represent the whole internal migrant workers in the Myanmar-China border area. In addition, due to the nature of cross-sectional study, it is difficult to find out causal relationships. Furthermore, it is also possible that participants underreported their gambling behavior because of social desirability effects. Despite these limitations, the findings provide new and important insights into gambling behaviors among internal migrants in the border area of China. In our opinion, there is a dearth of studies on gambling behaviors in Southeast Asian countries particularly among internal migrants in national border areas. The study has increased our understanding of the gambling involvement and addiction among internal migrants. Without evidence-based information on gambling practices and its related problems among internal migrant workers in national border areas, it is not a surprise that local authorities would not believe many internal migrant workers have gambling problems, not to mention developing appropriate measures to address this health hazard. The findings of this study highlight the need for culturally specific preventive measures for the Myanmar population.

In conclusion, this study showed that Nhit-Lone, EGMs, dice and card games and higher gambling involvement and intensity are strongly associated with problem gambling. The findings provide important new insights into gambling behaviors among internal migrants in the border area of China and the need for culturally specific preventive measures for the Myanmar population, taking preferences of gambling types across population groups.

## CONFLICT OF INTEREST

All the authors declare that they have no conflict of interest.

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