Alcohol Drinking Behaviour and Economic Cost Incurred by Users in Khon Kaen

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***Background**: Alcohol consumption increases health risks and social consequences. It also lowers productivity resulting in economic losses for drinkers and the rest of society.*
***Objective**: To investigate alcohol drinking behavior and to estimate economic cost incurred by alcohol users in Khon Kaen province in 2007.*
***Material and Method**: A cross-sectional survey targeting the population aged 12-65 years old was conducted in 20 communities. Data were collected using full-structured questionnaires through interviews.*
***Results**: Among 1,053 respondents, 53.0% drank alcohol sometime in their lives (95% CI: 46.1, 59.9). The percentage of individuals drinking in the past 12 months was 43.3% (95% CI: 37.1, 49.5). The average number of drinking days in past 12 months was 36.8 days. Most respondents drank for social activities, mainly with friends and relatives. Individual costs of alcohol consumption varied greatly. The weighted average cost in 2007 was 975.5 Baht per drinker. The estimated overall cost of alcohol consumption in Khon Kaen, in 2007, was 691.2 million Baht (95% CI: 280.0, 1,102.3 million), or 502.9 Baht per capita.*
***Conclusion**: More than half of the Khon Kaen population drank alcohol sometime in their lives and 43.3% were current drinkers. The average number of drinking days in past 12 months was 36.8 days. The estimated cost of alcohol consumption in Khon Kaen province was enormous.*

***Keywords**: Alcohol drinking behavior, Cost, Khon Kaen*

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Alcohol consumption contributes to an increased risk for mortality and morbidity in both chronic diseases and injuries[1,2]. The WHO Global Burden of Disease project estimated that alcohol use caused 1.8 million deaths, or 3.2% of total deaths and a loss of 58.3 million Disability-Adjusted Life Years (DALYs) or 4% of total DALYs[3,4]. Several studies on the economic costs of alcohol abuse have been conducted in several countries and the estimated social costs were substantial[5].

In Thailand, the percentage of alcohol drinkers was 30.0%-37.4%[6-10]. The estimated social cost of alcohol consumption in Thailand in 2006, was 156.10 billion baht, with an average of 2,391 baht per capita[11]. The prevalence of current drinkers in Khon Kaen was reported to be 45.9%-46.2%[9,12]. Furthermore, the prevalence of driving or motorcycling after drinking in last 30 days was 8.9% and 20.0%[9]. In addition, 36.1% have had a brawl and 30.7% have had an accident[12]. In the present study, the authors aimed to investigate alcohol-drinking behavior of a Khon Kaen population aged 12-65 years old and to estimate costs incurred by alcohol users in Khon Kaen province in 2007.

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Material and Method

This cross-sectional household survey was approved by Human Research Ethics Committee of Khon Kaen University, No. HE500110. The study population was aged between 12 and 65 years old, of Thai nationality and who had lived in the communities at least 90 days prior to the survey. Individuals who lived in military camps, temples, government offices, dormitories, or temporary construction sites were excluded. The sampling unit was households and all eligible persons in the sampled household were

interviewed. The sample size was determined based on the percentage of lifetime drinkers in Northeast in 2005[13], 60% and acceptable different of 5%. Sample size was adjusted for an expected response rate of 85% and a design effect of 3.8 (applied from design effects of individual variables from a household survey in South Africa in 1999)[14]. The average number of participants aged 12-65 years old per households was 3.3 in the Northeast, and the expected household accessible rate of 85% were applied to predict the optimal number of sampling units. Multistage sampling was performed to obtain 592 sampled households, from 5 urban communities and 15 rural villages.

A fully-structured questionnaire was developed and pretested. The tri-level method was applied to measure the volume of alcohol drinking and illustrations of alcoholic beverages and sizes of containers in "Thai Drinking Survey Guide" were used as the reference for types of alcohol beverages and containers. Self-reported volumes of alcohol intake were tested for its validity in 33 volunteers using the duplication technique, and yielded the Spearman's rho Correlation coefficient of 0.72 (p-value < 0.001), with Cronbach's Alpha = 0.873. Reliability for costs was tested with collateral information without the presence of the respondent. Cronbach's alpha for overall costs was 0.6 and intraclass correlation coefficients of the total cost was 0.6 (p-value = 0.010).

The questionnaire was divided into 4 parts. Part 1 gathered demographic information. Part 2 obtained the number of perceived health problems and injuries and number of episodes related to alcohol consumption. Part 3 collected information of alcohol drinking behavior in terms of drinking experience, frequency, as well as frequency of binge drinking. Part 4 inquired of alcohol related consequences and costs incurred as well as time lost.

Data collection was performed during February-March 2007 by 6 trained research assistants. Data were collected using face-to-face interviews. Before data collection, objectives and data collection procedures were explained and interviewees were informed that participation was on a voluntary basis. In addition, the interview was conducted without monitoring or intervention from other family members. Data were recorded anonymously. Questionnaires were then scanned for electronic data entry. Data were rechecked and then transferred to SPSS 15.0. The volume of ethanol intake was calculated from the amount of each type of alcohol beverage consumed in each level, multiplied by the percentage of ethanol content in each type, the frequency of drinking in past 12 months, and the alcohol specific density of ethanol alcohol (0.793)[15]. The economic costs were calculated from (a) out of pocket expenses for consumption, (b) out of pocket expenses through indirect spending for other expenses such as travelling and lodgings, (c) individual productivity losses from work absence applying the human capital approach, (d) relative's productivity losses for care during treatment and recovery and (e) other costs such as damaged property, fines and fees for law suits, including victim reconciliation. The expenses for alcoholic beverages were not included as it was considered detraction from the pleasure from drinking.

Descriptive data analysis was performed using SPSS 15.0, and STATA 10.0. Categorized variables were analyzed for frequency and percentage. Continuous variables were analyzed for mean, median, standard deviation (SD), and inter-quartile range (IQR). In extrapolating the percentages of alcohol drinking and costs, direct standardization was performed to obtain the weighted percentage and weighted average of costs of alcohol consumption using WinPepi 8.4.

Results

Out of total of 592 sampled households and 1,419 eligible subjects, 523 households were accessed and 1,053 subjects were interviewed, accounting for an access rate 88.3% and response rate 74.2%. Among 1,053 respondents, most of them were female (57.0%). The average age was 39.5 (SD = 15.0). Most of them finished primary school (69.9%). About 42.4% were agriculturalists and 18.2% were students. About two thirds were married and 24.6% were single. The median annual income was 24,000.0 Baht (IQR = 57,300).

More than half of persons (52.9%) drank alcohol sometime in their lives. The percentages of drinkers in the past 12 months and past 30 days were 43.3% and 34.9%. The percentage of drinkers in the urban areas was higher than those in the rural areas. The average age of their first drink was 22.2 (SD = 8.4). About half started drinking at the age of 15-20, and 8.3% had their first drink at the age of 14 or younger as shown in Table 1. The weighted percentage of lifetime drinkers was 52.9% (95% CI: 46.1, 59.9) and drinking in past 12 months was 43.3% (95% CI: 37.1, 49.5).

Among the current drinkers, about one fifth drank 1-3 times per month, and 8.6% drank everyday. The average number of drinking days was 36.8 in the last 12 months (SD = 83.1). With regard to the drinking occasion, 30.6% of them drank alcohol without any

specific occasion, while 26.9 and 25.6% drank only in connection with a celebration or festival (Table 2). The major reason for drinking was social (61.5%) and celebration (19.2%). Nearly half (49.0%) reported that the amount of drinking was consistent. Almost all (89.9%) drank alcohol with friends or relatives, and 37.3% did binge drinking at least once a month.

It was revealed that the younger age groups had higher alcohol intakes than the older age groups, and males had a higher alcohol intake than females as shown in Fig. 1.

About 43% of drinkers reported having health

Table 1. Alcohol drinking experience

	Urban		Rural		Total	
	No.	%	No.	%	No.	%
Drinking experience	(n = 178)		(n = 875)		(n=1,053)	
Ever drank	100	56.2	457	52.2	557	52.9
Drinking in past 12 months	84	47.2	372	42.5	456	43.3
Drinking in past 30 days	69	38.8	299	34.2	368	34.9
Age of first drink (years)	(n = 100)		(n = 451)		(n = 551)	
14 or less	13	13.0	33	7.3	46	8.3
15 - 17	31	31.0	109	24.2	140	25.4
18-20	23	23.0	116	25.7	139	25.2
21-25	21	21.0	87	19.3	108	19.6
26-30	7	7.0	41	9.1	48	8.7
31-35	1	1.0	22	4.9	23	4.2
36-40	4	4.0	22	4.9	26	4.7
41 or over			21	4.7	21	3.8
Mean (SD)	19.9 (5.9)		22.7 (8.8)		22.2 (8.4)	
Median (IQR)	18.0 (8.0)		20.0 (8.0)		20.0 (8.0)	

Table 2. Drinking behaviour in past 12 months

	Urban		Rural		Total	
	No.	%	No.	%	No.	%
Frequency of drinking	(n = 85)		(n = 355)		(n = 440)	
< 1 time per month	26	30.6	126	35.5	152	34.5
1-3 times per month	15	17.6	75	21.1	90	20.5
1-2 times per week	11	12.9	45	12.7	56	12.7
3-4 times per week	13	15.3	50	14.1	63	14.3
5-6 times per week	11	12.9	30	8.5	41	9.3
Everyday	9	10.6	29	8.2	38	8.6
Mean (SD) days	50.5 (97.2)		34.0 (79.8)		36.8 (83.1)	
Median (IQR) days	1.0 (34.5)		1.0 (15.0)		1.0 (18.0)	
Drinking occasion	(n = 85)		(n = 372)		(n = 456)	
Social activity	5	5.9	59	15.9	64	14.0
Celebration	33	38.8	90	24.2	123	26.9
No specific occasion	35	41.2	105	28.2	140	30.6
Stress/strain	1	1.2	3	0.8	4	0.9
Festivals	11	12.9	106	28.5	117	25.6
Others			9	2.4	9	2.0

problems and 20.0% experienced an accident or injury in the past 12 months. The average number of absence days related to alcohol consumption among drinkers was 1.6 days in past 12 months. The very high-risk drinkers had an average number of absentee days of 5.6 days, followed by high-risk drinkers with average of 2.6, in past 12 months.

Total economic cost of alcohol consumption was 531,634 Baht. Individual productivity loss was 296,706 Baht or 50.7% of total cost, followed by family member productivity loss, accounting for 153,648 Baht or 28.9%. Direct medical cost and direct non-medical cost accounted for 16.6% and 1.9% of total cost. The average economic cost per drinker was 975.5 Baht (SD = 6,892.2) and cost per sample was 517.2 Baht (SD = 5,042.6). Applying the weighted cost per drinker to estimated number of drinkers in Khon Kaen province, the estimated private economic cost of alcohol consumption in Khon Kaen was 691.1 million Baht (95% CI: 280.0, 1,102.3) or average cost per capita was 502.9 Baht (95% CI: 181.98, 823.83), and accounting for 0.6% of Gross Provincial Product in 2007.

Discussion

Data collection in present study obtained fewer samples than the calculated sample size required. The actual average family size was 2.5 and the response rate was lower than expected. The selected sites in urban areas were in a commercial area in which life styles were considered to be busy. For the rural areas, most of non-responders were those who had just migrated to big cities after having finished school and those working in factories many of whom had to work overtime until very late in the evening.

With regard to the low response rate, the authors performed best and worst case analyses to

Table 3. Value of economic cost of alcohol consumption in sample

	Value (Baht)	% of total cost
Direct medical treatment cost	88,010	16.6
Direct non-medical treatment cost	10,120	1.9
Individual productivity loss	269,706	50.7
Family member's productivity loss	153,648	28.9
Others	10,150	1.9
Total economic cost	531,634	100.0

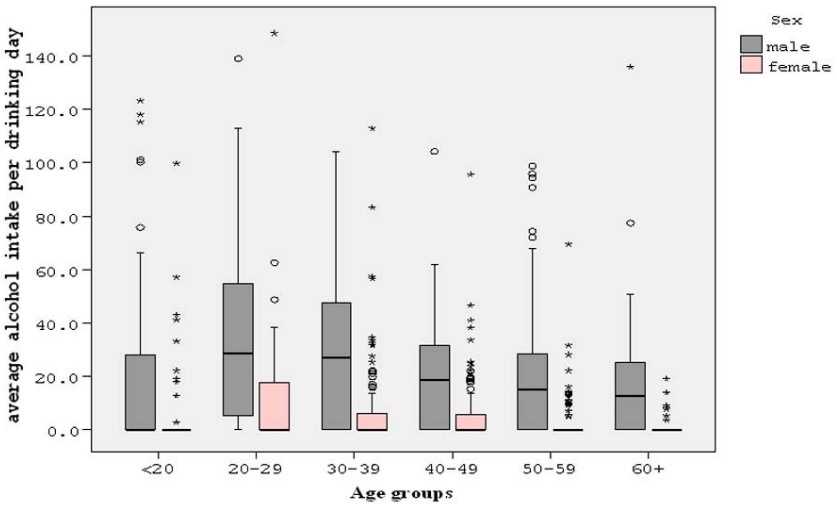

Fig. 1 Pure alcohol intake per drinking day in past 12 months by gender and age group (n = 1,053)

investigate the effects of non-response. In the best-case analysis, the weighted percentage of lifetime drinkers would be lowered to 39.5% (95% CI: 34.7, 44.4) and in worst case analysis the percentage was 64.2% (95% CI: 55.2, 73.3). Applying the number of lifetime drinkers for cost estimation, in the best-case analysis, the cost would be 515.6 million baht (95% CI: 208.9, 822.2) and 837.8 million baht (95% CI: 339.4, 1336.1) for the worst-case analysis. It was shown that non-response had an effect on the percentage of lifetime drinkers but little effect on costs.

The present study revealed that the percentage of Khon Kaen population that ever drank was 52.9% (95% CI: 50.2, 56.1) and current drinkers were 43.3%, and 34.9% drank in past 12 months and 30 days prior to being interviewed. The proportion of drinkers in past 12 months was found to be slightly lower than the 45.9% from the results of BRFSS study in Khon Kaen, conducted in 2005[9]. This might have been caused by the different age limits of study population of 15-74 years old in BRFSS study. Both studies, however, showed that alcohol drinking was consistently high in the Khon Kaen population. This might be the result of wide availability and easily access to alcohol beverages in any setting.

The results of present study showed that the costs of alcohol consumption incurred by users was dominated by productivity loss, with individual productivity loss of 50.7% of total cost of drinking behavior and family productivity loss of 28.9% of total cost, followed by direct medical treatment costs (16.6%) of total cost. This can be explained in the Thai context that family members accompany family members to the hospital especially during inpatient treatment.

The weighted average costs of alcohol consumption of 502.9 Baht per capita seems to be considerably low compared to social cost study in Thailand[11]. This may have been caused by the scope of costs in the present study that were based on self-reporting of perceived health problems and accidents which were generally limited to acute conditions and accidents, unlike the social cost study in which alcohol attributable diseases and injuries covered a wider range of diseases conditions. In addition, the present study measured costs incurred in the past 12 months, mainly short run direct costs for treatment and productivity loss due to absence, whereas the social cost study covered treatment costs of both acute and chronic health problems, as well as future earnings losses from premature death.

The cross-sectional household survey was considered to be an appropriate way to obtain unregistered alcohol related health problems and consequences and ultimately the economic cost of alcohol consumption incurred by users that were mostly non-institutional costs. The household survey, however, also has the limitation to not be able to obtain the cases with a low incidence or low prevalence, especially cases with severe health problems or injuries, resulting in a cost that may be lower than actual.

Conclusion

The present study revealed that the weighted percentage of alcohol drinking was 52.9 % (95% CI: 46.1, 59.9) for lifetime drinkers, and 43.3 (95% CI: 37.1, 49.5) for the past 12 months. The total economic cost of alcohol consumption among respondents accounted for 531,634 Baht. The weighted average costs of alcohol consumption accounted for 502.91 Baht per capita (95% CI: 182.0, 823.8). The estimated economic cost of alcohol consumption in Khon Kaen in 2007 was 691.2 million Baht (95% CI: 280.0, 1,102.3).

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พฤติกรรมการดื่มเครื่องดื่มแอลกอฮอล์ และความสูญเสียทางเศรษฐกิจต่อผู้บริโภคในจังหวัดขอนแก่น

สุชาดา ภัยหลีกลี้, มานพ คณะโต, สุเมธ แก่นมณี, Sarah M. McGhee

***ภูมิหลัง**: การดื่มเครื่องดื่มแอลกอฮอล์ มีผลเสียต่อสุขภาพ ผลกระทบต่อสังคม และประสิทธิภาพการทำงาน ส่งผลให้เกิดความสูญเสียทางเศรษฐกิจทั้งต่อผู้บริโภคและต่อสังคม.*

***วัตถุประสงค์**: เพื่อศึกษาพฤติกรรมการดื่มเครื่องดื่มแอลกอฮอล์ และเพื่อประมาณมูลค่าความสูญเสียทางเศรษฐกิจที่มีต่อผู้บริโภคเครื่องดื่มแอลกอฮอล์ในจังหวัดขอนแก่น พ.ศ. 2550*

***วัสดุและวิธีการ**: การศึกษาเชิงพรรณนาภาคตัดขวางในประชากรอายุ 12-65 ปี ทำการเก็บข้อมูลโดยใช้แบบสัมภาษณ์ชนิดมีโครงสร้างแน่นอน ในพื้นที่ 20 ชุมชนในเดือนมีนาคม พ.ศ. 2550*

***ผลการศึกษา**: ผู้ตอบแบบสัมภาษณ์ 1,053 คน ผู้ที่เคยดื่มสุรามีร้อยละ 52.90 (95% CI: 46.1, 59.9) ผู้ที่ดื่มสุราในรอบ 12 เดือน มีร้อยละ 43.3 (95% CI: 37.1, 49.5) ค่าเฉลี่ยจำนวนวันที่ดื่มในรอบ 12 เดือน ที่ผ่านมาเท่ากับ 36.8 วัน ผู้ดื่มส่วนใหญ่ดื่มเพื่อการสังสรรค์ โดยดื่มกับเพื่อนหรือญาติเป็นส่วนมาก มูลค่าความสูญเสียทางเศรษฐกิจระดับบุคคลมีความแตกต่างกันมาก ค่าเฉลี่ยความสูญเสียเมื่อถ่วงน้ำหนักในประชากรเท่ากับ 975.5 บาท ต่อผู้เคยดื่ม เมื่อคำนวณความสูญเสียไปในยอดประมาณการผู้เคยดื่มในจังหวัดขอนแก่น มูลค่าความสูญเสียทางเศรษฐกิจในภาพรวมของจังหวัดขอนแก่น พ.ศ. 2550 มีมูลค่าสูงถึง 691.2 ล้านบาท (95% CI: 280.2, 1,102.3) หรือเฉลี่ยเท่ากับ 502.9 บาทต่อประชากร*

***สรุป**: ประชากรจังหวัดขอนแก่นกว่าครึ่งหนึ่งเคยดื่มเครื่องดื่มแอลกอฮอล์ และร้อยละ 43.3 ยังคงดื่มในรอบ 12 เดือน จำนวนวันที่ดื่มเฉลี่ย 36.8 วัน มูลค่าความสูญเสียทางเศรษฐกิจในภาพรวมมีมูลค่ามหาศาล*