

Research Trends



Suicidal Plans and Attempts Among Adolescents in Mongolia

Urban Versus Rural Differences

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Abstract. *Background:* Although 75% of suicides occur in low- and middle-income countries, few studies have examined suicidal behaviors among young people in these countries. *Aims:* This study aimed to examine what individual characteristics were associated with suicidal plans and attempts among Mongolian youth and whether suicidal risks and behaviors varied by urban and rural locations. *Method:* Logistic regression analyses were utilized to investigate suicidal plans and attempts among 5,393 adolescents using the Global Student Health Survey – 2013. *Results:* Adolescents who lived in urban areas were at higher risk for suicidal plans and behaviors than those who lived in rural areas; however, the patterns of suicidal risks were similar. Specifically, individual characteristics, such as being female, feeling lonely and worried, smoking cigarettes, drinking alcohol, and having fights at school, were associated with suicidal plans and behaviors regardless of the residential places. *Limitations:* A number of important variables have not been included in the questionnaire such as depression, family and parental support, household income, family constructs etc. *Conclusion:* Given the comparable patterns of risk between urban and rural adolescents and the relatively high rates of suicidal plans and attempts, similar mental health services and interventions are necessitated for both urban and rural areas.

Keywords: suicide, plans, attempts, adolescents, Mongolia

Global epidemiological estimates from the World Health Organization (WHO) indicated that about 800,000 people died from suicide in 2012 (WHO, 2014). Limitations in data collection and cultural sensitivities surrounding the topic of suicide in some societies suggest this estimate to be conservative. It is projected that by 2020 suicide will comprise more than 2% of the global burden of diseases (WHO, 2014). Moreover, suicide was the second-leading cause of death for 15–29-year-olds internationally in 2012 (WHO, 2014).

Suicidal behavior is a complex phenomenon, but a number of factors spanning biological, psychological, and social domains have proven to be robust predictors across numerous populations (Buhnick-Atzil et al., 2015; Sinyor, Schaffer, & Cheung, 2014). Among adolescents, psychiatric disorders, alcohol use disorder, substance use, and other risky behaviors are consistently identified as predictors of suicidal behavior (Fortune, Stewart, Yadav, & Hawton, 2007; Houston, Hawton, & Shepperd, 2001; Kelly, Cor-

nelius, & Clark, 2004; Qin, 2011; Thibodeau, Welch, Saaren, & Asmundson, 2013). For instance, in one study the likelihood of suicide attempts increased by almost 250% with each additional psychiatric diagnosis that an individual received (McManama O'Brien, Becker, Spirito, Simon, & Prinstein, 2014). Other risky behaviors such as cigarette use and physical fighting have also been significantly related to suicidal behavior among adolescent populations (Brunstein Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2007; Han, Kim, Ryu, Kang, & Park, 2009; Hinduja & Patchin, 2010; Kang et al., 2015; King & Merchant, 2008; Page, West, & Hall, 2011).

However, suicide risk factors are not necessarily monolithic across different geographical areas. Not only has an increasing body of research continually demonstrated that rural areas in most countries have higher rates of suicide than urban areas (e.g., Hirsch & Cukrowicz, 2014; Kelleher et al., 2002; Pearce, Barnett, & Jones, 2007; Razvodovsky & Stickley, 2009; Searles, Valley, Hedegaard, & Betz, 2014;

Singh & Siahpush, 2002), but also recent work suggests that rural and urban areas may additionally differ with respect to the risk and protective factors for suicidal ideation and behavior. For example, despite the higher rates of suicide in rural Australia, McLaren and Hopes (2002) found that, compared with their urban counterparts, rural Australians reported having significantly more to live for. Similarly, Xianyun and Michael (2010) determined that rural Chinese were significantly less accepting of suicide as a response to life stress compared with Chinese living in urban areas. Furthermore, Murphy (2014), in his study of Washington state adolescents, determined that it was appropriate to estimate separate predictive models for urban and rural adolescent suicidal ideation, as risk and protective factors differed between residential settings in their relation to suicidal ideation and behavior (e.g., only among urban adolescents did higher frequency of certain substance use significantly increase the likelihood of suicidal ideation).

Nevertheless, although research has found differences between rural and urban areas along other dimensions of suicidality, to date most studies exploring the rural-urban divide have focused on differences in rates of completed suicide. Less is known regarding the variance in rates of suicidal ideation and nonfatal behavior, and, the aforementioned articles notwithstanding, there is a lack of research investigating the differential pattern of risk factors between rural and urban environments (Handley, Inder, Kelly, Attia, & Kay-Lambkin, 2011). Moreover, few studies have specifically focused on adolescent suicidal ideation and behavior in this context. Further investigating rural-urban divisions in suicidal behavior and risk factors can help elucidate the mechanisms underlying suicide as well as inform the development of more targeted prevention programs.

Mongolia is a prime candidate for further study in this regard, as not only does it have diverse geographical communities, but also suicide prevention there, like in most low- and middle-income countries (and high-income countries for that matter), has been under-prioritized relative to its burden (Sharan et al., 2009). Indeed, there are no official statistics on suicide in Mongolia. Thus far only one article has focused on suicidal behavior among Mongolian youth: According to this study of 5,148 adolescents, 12.8% of high school students endorsed a suicidal plan and more than 8.7% reported attempts in the last 12 months (Altangerel, Liou, & Yeh, 2014).

In light of research on the variation in suicidal behavior across residential settings and the clear need for further data on suicide risk in Mongolia, the current study examined the patterns of risk factors among urban and rural adolescents using the Global School-based Health Survey (GSHS)-2013. This is the first study to explore patterns of individual risk within urban and rural settings in Mongolia.

Method

The GSHS-2013 was developed by the WHO to estimate the prevalence of health behaviors to assist with establishing priorities and interventions for improving the health of school-aged children. It is collected every 3–5 years in developing countries. For the 2013 data, a two-stage randomized clustering method was used both at school and class levels. In all, 59 of 630 (140 urban and 490 rural) schools were randomly selected from urban and rural areas in Mongolia.

Study Participants

Using the GSHS, a total of 5,393 children aged 12–17 years were assessed, of whom 2,843 (51.7%) were females and 2,498 (48.3%) were males. Approximately 40% of participants lived in urban settings and 60% in rural areas. About 21% were studying in the seventh grade, 20.3% in the eighth grade, 19.5% in the ninth grade, 22.2% in the 10th grade, and 15.8% were studying either in the 11th or 12th grades.

Measures

The GSHS-2013 variables included suicidal plans and attempts, which are the outcome variables in the present study (Table 1). The attempt variable was dichotomized such that if students had attempted one time or more times they were included in the *yes* category. Several different independent variables from varying domains were included:

1. Demographic and socioeconomic factors: sex, grade, living situations, and being hungry owing to insufficient food at home (dichotomized as *never* vs. the remaining three categories). In the Mongolian context, living in dormitories and tent-like structures called *gers* suggests not being able to rent or own a house or apartment, and as such was considered a socioeconomic factor.
2. *Distress factors*: feeling lonely and feeling worried. These were categorical variables with four levels, with *never* as the reference group.
3. Risky behaviors: smoking cigarettes, drinking alcohol, having physical fights, being bullied, and missing classes without permission. All were dichotomized such that anything greater than zero frequency was considered a *yes*.
4. Peer relationships: having friends, peers being helpful and kind at school, and being bullied at school. Having friends was a three-level categorical variable, with *none* as the reference group. Having helpful peers and being bullied were dichotomized such that anything greater than zero was considered a *yes*.
5. *Residential locations*: urban (city and ger districts) and rural (aimags and soums).

Table 1. Variables in the analyses and their English translation: Global Student Health Survey-2013

Variables	Measurements	Questions
Outcome variables		
Suicidal plan	Yes No	During the past 12 months, have you made a plan about how you would attempt suicide?
Suicidal attempt	Never 1–3 times 4–5 times 6 or more	During the past 12 months, how many times have you actually attempted suicide?
Demographics and socioeconomic factors		
Sex	Male Female	What is your sex?
Grade	7th 8th 9th 10th 11th	In what grade are you?
Living situation	Ger Dormitory Apartment House	What is your living condition now?
Being hungry	Never Rarely Sometimes Most of the time/always	During the past 30 days, how often did you go hungry because there was not enough food in your home?
Distress factors		
Feeling lonely	Never Rarely Sometimes Most of the time/always	During the past 12 months, how often have you felt lonely?
Feeling worried	Rarely Sometimes Most of the time/always	During the past 12 months, how often have you been so worried about something that you could not sleep at night?
Risky behaviors		
Smoking cigarette	0 day 1–2 days 3–5 days 6–9 days	During the past 30 days, on how many days did you smoke?
Drinking alcohol	10–16 days 20–29 days Everyday	During the past 30 days, on how many days did you have at least one drink containing alcohol?
Physical fights		During the past 12 months, how many times were you in a physical fight?
Missed classes		During the past 30 days, on how many times did you miss classes or school without permission?
Peer relationships		
Having friends	1–2 3+ None	How many close friends do you have?
Peers are helpful	Never Rarely Sometimes Most of the time/always	During the past 30 days, how often were most students in your school kind and helpful?
Bullied	Yes No	During the past 30 days, have you been bullied at school?
Residential locations		
Residential locations	City Ger district Aimag Soum/bag	Where do you live now?

Notes. Ger district = Residential districts on outskirts of a capital city; Aimag = Permanent settlement in rural areas; Soum/bag = nomadic rural communities.

Statistical Analysis

All analyses were conducted for the total study population, as well as within rural and urban subgroups. Initially, univariate logistic regression analyses were conducted to examine unadjusted associations between the independent variables and suicide plans and attempts. Next, two multivariate logistic regression analyses were conducted to examine the associations of suicidal plans and attempts with all independent variables that had significant univariate associations with the outcomes. Age was omitted from the analyses because of high collinearity with school grade. Moreover, 50 individuals were excluded because of missing data on any of the variables in the study. The design clustering within schools and classes could not be taken into consideration because the data were completely de-identified, that is, schools and classes were not differentially coded. SAS Version 9.3 (SAS Institute, 2011) was used for the analyses.

Results

Overall, 14.7% of students endorsed having a suicidal plan, and about 10% of students had attempted suicide in the past 12 months. Of the students who had a suicidal plan, nearly half (48.3%) had attempted suicide. Conversely, of those who attempted suicide, nearly three-quarters (73.7%) reported having a suicidal plan. Thus, suicidal plans and attempts were correlated (Spearman correlation = .54), but not redundant. Significantly, more students in urban areas than rural areas had suicidal plans (17.4% vs. 12.9%; see Table 2) and suicide attempts (11.8% vs. 8.6%; see Table 3). All independent variables were significantly associated with both suicide plans and suicide attempts in the total sample, as well as within the urban and rural subgroups, with the exception of school grade, living situation, and being hungry. Overall, females reported a significantly higher percentage of suicidal plans and suicide attempts than did males. Being distressed (i.e., feeling lonely or worried), engaging in all the risky behaviors (i.e., smoking cigarettes, drinking alcohol, fighting) and being bullied significantly increased the odds of reporting suicide plans and attempts. The number of friends an individual had and having helpful friends were consistently protective.

Multivariate Associations With Suicidal Plans

Females continued to be more likely to have suicidal plans, even when adjusting for all other independent variables,

overall and within the rural and urban subgroups (Table 4). Distress factors, particularly feeling worried, had the strongest associations with suicide plans. Any level of worrying was associated with an increased odds of having a suicide plan. Most notably, youth who felt worried always or most of the time had over five times the odds of having a suicide plan compared with those who were never worried. In addition, adolescents who felt lonely always or most of the time were significantly more likely to have suicidal plans than those who did not feel lonely. This was consistent across the total sample and the rural and urban subgroups. Students who engaged in risky behaviors such as smoking cigarettes, having fights at school, and missing classes were significantly more likely to report suicidal plans for the total sample and for both residential subgroups. Students who reported drinking alcohol were significantly more likely to endorse suicidal plans for only the total and rural, but not urban, samples. Being bullied was significantly associated with suicide plans in the total sample and among rural students, but not among urban students.

Having three or more close friends was a protective factor against suicidal plans for the total sample but not for the urban and rural subgroups. There were no significant differences between students who reported having one or two close friends compared with not having any close friends. Having helpful and kind peers at school was a significant protective factor for the total and rural samples but not for the urban group.

Multivariate Associations With Suicide Attempts

Again, females were significantly more likely to attempt suicide than were males, even adjusting for other risk characteristics (Table 5). Students who reported feeling lonely always or most of the time had significantly higher odds of attempting suicide than those who did not feel lonely. This was evident for the total sample and the urban and rural subgroups. Feeling lonely only rarely or sometimes was not significantly associated with attempting suicide. Feeling worried, at any level, had the strongest associations with suicide attempts. Overall, youth who felt worried always or most of the time had nearly 8 times the odds of attempting suicide compared with those who were not worried at all. Among urban and rural youth, the odds were 6.26 and 9.65, respectively. The pattern of associations between engaging in risky behaviors and attempting suicide was similar to that described with respect to suicide plans. Among youth in the total sample, smoking cigarettes, drinking alcohol, and getting into physical fights at school significantly increased the odds of a suicide attempt. These risky be-

Table 2. Characteristics associated with suicidal plans by residential location, univariate results

	Total			Urban			Rural		
	N (%) with plans	OR	95 % CI	N (%) with plans	OR	95% CI	N (%) with plans	OR	95% CI
Demographics and socioeconomic factors									
Gender									
Male (n = 2,498)	315 (12.6)	-	-	164 (15.4)	-	-	148 (10.5)	-	-
Female (n = 2,843)	472 (16.6)	1.38***	1.18-1.61	208 (19.5)	1.33*	1.07-1.67	260 (14.8)	1.48***	1.19-1.83
Grade									
7th (n = 1,361)	209 (15.4)	-	-	117 (18.7)	-	-	91 (12.6)	-	-
8th (n = 932)	124 (13.4)	.85	.67-1.08	49 (14.5)	.73	.51-1.05	75 (12.8)	1.02	.73-1.41
9th (n = 1,183)	178 (15.1)	.98	.79-1.21	86 (17.0)	.89	.65-1.20	89 (13.3)	1.06	.78-1.46
10th (n = 1,116)	167 (15.0)	.97	.78-1.21	70 (17.7)	.93	.67-1.29	96 (13.7)	1.10	.81-1.50
11th (n = 714)	101 (14.2)	.91	.70-1.18	48 (19.4)	1.05	.72-1.52	53 (11.5)	.90	.63-1.29
Living situations									
Apartment (n = 1,661)	197 (15.8)	-	-	185 (17.5)	-	-	268 (11.9)	-	-
Living in ger (n = 1,511)	70 (15.0)	.85	.71-1.02	4 (14.8)	1.05	.83-1.32	66 (15.2)	.89	.64-1.23
Dormitory (n = 1,671)	458 (13.8)	.94	.70-1.27	150 (16.9)	.86	.29-2.51	47 (13.2)	1.17	.78-1.75
House (n = 463)	51 (19.3)	1.28	.91-1.79	30 (20.6)	1.27	.82-1.97	21 (18.3)	1.46	.83-2.57
Being hungry									
No (n = 3,322)	298 (15.0)	-	-	155 (19.1)	-	-	139 (12.0)	-	-
Yes (n = 1,984)	493 (14.7)	1.03	.88-1.20	217 (16.6)	1.18	.94-1.49	270 (13.4)	.89	.71-1.10
Distress factors									
Feeling lonely									
Never (n = 1,484)	131 (8.5)	-	-	45 (8.5)	-	-	83 (6.3)	-	-
Rarely (n = 1,642)	186 (11.3)	1.37**	1.08-1.73	85 (10.4)	1.55*	1.06-2.26	97 (7.2)	1.25	.92-1.70
Sometimes (n = 1,536)	254 (16.6)	2.12***	1.70-2.66	126 (13.8)	2.89***	2.00-4.15	127 (13.6)	1.73***	1.29-2.31
Most of the time/always (n = 644)	219 (34.3)	5.58***	4.38-7.12	115 (30.4)	6.86***	4.67-10.07	102 (28.8)	4.72***	3.42-6.52
Feeling worried									
Never (n = 2,227)	184 (8.1)	-	-	75 (7.5)	-	-	107 (4.4)	-	-
Rarely (n = 1,863)	260 (14.0)	1.84***	1.51-2.25	125 (12.6)	1.88***	1.38-2.54	132 (10.6)	1.78***	1.36-2.33
Sometimes (n = 920)	204 (22.4)	3.27***	2.63-4.06	100 (18.8)	3.82***	2.74-5.31	102 (21.5)	2.85***	2.13-3.82
Most of the time/always (n = 296)	144 (48.7)	10.7***	8.17-14.12	72 (47.6)	9.90***	6.62-14.82	69 (37.2)	11.22***	7.67-16.42

Table 2. continued

	Total			Urban			Rural		
	N (%) with plans	OR	95% CI	N (%) with plans	OR	95% CI	N (%) with plans	OR	95% CI
Risky behaviors									
Smoking cigarette									
No (n = 4,855)	131 (29.4)	-	-	40 (24.0)	-	-	77 (27.6)	-	-
Yes (n = 451)	653 (13.4)	2.70***	2.16-3.36	366 (12.3)	2.69***	2.03-3.57	167 (9.1)	2.26***	1.56-3.27
Drinking alcohol									
No (n = 4,884)	120 (28.7)	-	-	52 (27.2)	-	-	60 (26.6)	-	-
Yes (n = 422)	654 (13.5)	2.59***	2.06-3.25	349 (11.9)	2.31***	1.69-3.16	185 (9.8)	2.77***	1.98-3.89
Physical fight									
No (n = 3,809)	340 (22.8)	-	-	168 (19.8)	-	-	120 (19.1)	-	-
Yes (n = 1,497)	448 (11.6)	2.24***	1.92-2.62	240 (10.3)	2.36***	1.87-2.97	131 (8.7)	2.14***	1.73-2.65
Missed class									
No (n = 4,050)	269 (21.4)	-	-	144 (18.7)	-	-	94 (19.7)	-	-
Yes (n = 1,256)	521 (12.8)	1.87***	1.59-2.20	265 (11.05)	1.98***	1.55-2.53	156 (9.4)	1.85***	1.48-2.31
Peer relationships									
Having friends									
No friend (n = 308)	76 (24.9)	-	-	37 (20.7)	-	-	31 (26.5)	-	-
1-2 friends (n = 1,288)	253 (19.6)	.74*	.55-.99	142 (17.9)	.66	.43-1.03	81 (16.8)	.84	.56-1.25
3 or more (n = 3,710)	457 (12.2)	.42***	.32-.55	226 (10.3)	.41***	.27-.62	138 (9.0)	.44***	.30-.65
Peers helpful									
No (n = 1,285)	549 (13.7)	-	-	281 (11.8)	-	-	183 (11.4)	-	-
Yes (n = 4,021)	238 (18.5)	.70***	.59-.82	126 (16.4)	.72*	.56-.93	65 (12.6)	.68**	.54-.86
Bullied									
No (n = 3,877)	304 (21.3)	-	-	157 (19.1)	-	-	102 (17.4)	-	-
Yes (n = 1,429)	442 (11.8)	2.03***	1.73-2.38	226 (10.1)	1.88***	1.48-2.38	132 (9.0)	2.11***	1.69-2.64
Residential locations									
Rural (3,161)	410 (12.9)	-	-						
Urban (2,145)	372 (17.4)	1.43***	1.23-1.66						

Note. ***p < .0001. **p < .001. *p < .01. (-) reference category.

Table 3. Characteristics associated with suicide attempts by residential location, univariate results

	Total			Urban			Rural		
	N (%) with attempt	OR	95 %CI	N (%) with attempt	OR	95 %CI	N (%) with attempt	OR	95 %CI
Demographics and socioeconomic factors									
Gender									
Male (n = 2,498)	203 (8.1)	-	-	203 (8.1)	-	-	106 (9.9)	-	-
Female (n = 2,843)	322 (11.4)	1.45***	1.21-1.74	322 (11.4)	1.44*	1.00-1.87	145 (13.6)	1.53***	1.18-1.98
Grade									
7th (n = 1,361)	135 (9.9)	-	-	74 (11.8)	-	-	60 (8.3)	-	-
8th (n = 932)	79 (8.6)	.85	.63-1.13	33 (9.8)	.81	.52-1.25	46 (7.9)	.95	.64-1.42
9th (n = 1,183)	123 (10.5)	1.06	.82-1.37	59 (11.7)	.99	.69-1.42	62 (9.4)	1.14	.79-1.65
10th (n = 1,116)	116 (10.4)	1.06	.81-1.37	54 (13.6)	1.17	.81-1.71	62 (8.9)	1.07	.74-1.55
11th (n = 714)	66 (9.3)	.93	.68-1.26	29 (11.7)	.98	.62-1.55	37 (8.0)	.96	.63-1.48
Living conditions									
Apartment (n = 1,661)	305 (9.2)	-	-	124 (11.7)	-	-	180 (8.0)	-	-
Living in ger (n = 1,511)	47 (10.2)	.83	.67-1.03	5 (17.9)	1.05	.80-1.38	42 (9.7)	.80	.54-1.16
Dormitory (n = 1,671)	135 (10.8)	.94	.65-1.32	100 (11.3)	1.71	.64-4.60	35 (9.9)	.99	.61-1.58
House (n = 463)	36 (13.7)	1.31	.88-1.94	22 (15.1)	1.40	.85-2.30	14 (12.4)	1.29	.67-2.50
Being hungry									
No (n = ,3322)	201 (10.2)	-	-	102 (12.6)	-	-	96 (8.3)	-	-
Yes (n = 1,984)	329 (9.8)	1.04	.86-1.25	150 (11.5)	1.11	.85-1.45	178 (8.9)	.93	.72-1.21
Distress factors									
Feeling lonely									
Never (n = 1,484)	80 (5.2)	-	-	34 (6.3)	-	-	44 (4.5)	-	-
Rarely (n = 1,642)	115 (7.0)	1.37*	1.02-1.83	50 (7.2)	1.15	.74-1.81	64 (6.9)	1.60*	1.06-2.33
Sometimes (n = 1,536)	166 (10.9)	2.21***	1.67-2.91	82 (13.6)	2.33***	1.53-3.54	84 (9.2)	2.14***	1.47-3.12
Most of the time/always (n = 644)	167 (26.0)	6.36***	4.77-8.46	87 (28.8)	5.99***	3.91-9.18	80 (23.7)	6.62***	4.47-9.80
Feeling worried									
Never (n = 2,227)	85 (3.8)	-	-	36 (4.4)	-	-	49 (3.5)	-	-
Rarely (n = 1,863)	180 (9.7)	2.73***	2.10-3.57	84 (10.6)	2.58***	1.72-3.86	94 (9.0)	2.77***	1.94-3.95
Sometimes (n = 920)	153 (16.7)	5.11***	3.87-6.74	79 (21.5)	5.97***	3.94-9.05	73 (13.4)	4.33***	2.97-6.31
Most of the time/always (n = 296)	114 (38.6)	16.08***	11.68-22.13	54 (37.2)	12.96***	8.06-20.82	59 (41.0)	19.44***	12.55-30.11

Table 3. continued

	Total			Urban			Rural		
	N (%) with attempt	OR	95 %CI	N (%) with attempt	OR	95% CI	N (%) with attempt	OR	95% CI
Risky behaviors									
Smoking cigarette									
No (n = 4,855)	118 (26.1)	-	-	77 (27.6)	-	-	40 (23.7)	-	-
Yes (n = 451)	396 (8.2)	3.97***	3.15-5.02	167 (9.1)	3.82***	2.81-5.19	226 (7.6)	3.78***	2.58-5.51
Drinking alcohol									
No (n = 4,884)	110 (26.0)	-	-	60 (26.6)	-	-	49 (25.4)	-	-
Yes (n = 422)	406 (8.4)	3.83***	3.01-4.87	185 (9.8)	3.32***	2.38-4.62	218 (7.5)	4.22***	2.97-6.00
Physical fight									
No (n = 3,809)	252 (16.8)	-	-	120 (19.1)	-	-	145 (6.3)	-	-
Yes (n = 1,497)	278 (7.2)	2.60***	2.16-3.11	131 (8.7)	2.48***	1.90-3.25	93 (12.1)	2.71***	2.10-3.48
Missed class									
No (n = 4050)	188 (14.9)	-	-	94 (19.7)	-	-	179 (7.5)	-	-
Yes (n = 1256)	338 (8.3)	1.94***	1.60-2.34	156 (9.4)	2.35***	1.78-3.11	130 (15.3)	1.70***	1.31-2.22
Peers relationships									
Having friends									
No friend (n = 308)	71 (24.4)	-	-	31 (26.5)	-	-	39 (22.8)	-	-
1-2 friends (n = 1288)	178 (13.8)	.50***	.36-.68	81 (16.8)	.56***	.35-.90	94 (11.9)	.46***	.30-.69
3 or more (n = 3710)	276 (7.4)	.25***	.18-.33	138 (9.0)	.28***	.18-.43	138 (6.3)	.23***	.15-.34
Peers helpful									
No (n = 1,285)	367 (9.5)	-	-	183 (11.4)	-	-	182 (7.7)	-	-
Yes (n = 4,021)	156 (12.1)	.73***	.60-.89	65 (12.6)	.89	.66-1.21	89 (11.6)	.63**	.48-.83
Bullied									
No (n = 3,877)	226 (15.9)	-	-	102 (17.4)	-	-	122 (14.9)	-	-
Yes (n = 1,429)	262 (7.0)	2.50***	2.07-3.03	132 (9.0)	2.13***	1.62-2.82	130 (15.3)	2.85***	2.20-3.71
Residential locations									
Rural (3,161)	270 (8.6)	-	-						
Urban (2,145)	251 (11.8)	1.42***	1.18-1.70						

Note. ***p < .0001. **p < .001. *p < .01. (-) Reference category.

Table 4. Characteristics associated with suicidal plans by residential location, multivariate results

	Total			Urban			Rural		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Demographics and socioeconomic factors									
Gender: Women	1.63	(1.35–1.97)	<.0001	1.49	1.13–1.97	.004	1.72	1.33–2.23	<.0001
Distress factors									
Feeling lonely									
Never	–	–	–	–	–	–	–	–	–
Rarely	1.07	(.83–1.39)	.60	1.33	.88–2.02	.17	.94	.67–1.32	.71
Sometimes	1.29	(.99–1.66)	.06	1.93	1.28–2.90	.002	.95	.67–1.32	.74
Most of the time/always	2.15	(1.60–2.90)	<.0001	2.98	1.89–4.70	<.0001	1.69	1.13–2.53	.01
Feeling worried									
Never	–	–	–	–	–	–	–	–	–
Rarely	1.40	(1.12–1.75)	.003	1.33	.95–1.87	.09	1.47	1.08–1.99	.01
Sometimes	2.05	(1.60–2.64)	<.0001	2.04	1.40–2.98	<.0001	2.11	1.51–2.96	<.0001
Most of the time/always	5.39	(3.88–7.50)	<.0001	4.89	3.04–7.87	<.0001	5.86	3.68–9.33	<.0001
Risky behaviors									
Smoking cigarette	1.67	(1.24–2.26)	.001	1.80	1.21–2.68	.004	1.50	.93–2.43	.10
Drinking alcohol	1.44	(1.07–1.95)	.02	1.14	.74–1.75	.55	1.91	1.25–2.91	.003
Physical fight	1.66	(1.37–2.02)	<.0001	1.69	1.27–2.25	.0001	1.64	1.25–2.14	<.0001
Missed class	1.53	(1.25–1.86)	<.0001	1.54	1.14–2.07	.005	1.55	1.19–2.02	.001
Peer relationships									
Having friends									
No friends	–	–	–	–	–	–	–	–	–
1–2 friends	1.05	(.74–1.49)	.79	.87	.52–1.46	.61	1.20	.74–1.95	.46
3 or more	.69	(.49–.97)	.03	.66	.40–1.07	.09	.71	.44–1.14	.15
Peers helpful	.73	(.61–.89)	.001	.76	.57–1.02	.09	.70	.54–.91	.008
Bullied	1.28	(1.05–1.56)	.01	1.22	.92–1.63	.17	1.34	1.03–1.75	.03
Residential locations									
Rural	–	–	–	–	–	–	–	–	–
Urban	1.28	(1.07–1.52)	.006	–	–	–	–	–	–

Note. (–) Reference category.

haviors also increased the odds of suicide attempts among rural and urban youth, with the exception of drinking alcohol, which was not significantly associated with attempts among urban youth. Further, students who missed classes had significantly higher odds of attempting suicide among the total sample and for urban, but not rural, students. Additionally, students who reported being bullied were significantly more likely to attempt suicide in the total sample and among rural and urban subgroups.

Having three or more friends protected adolescents against attempting suicide for the total sample and for both residential subgroups. However, there were no significant differences between students who reported that they had only one or two friends compared with no friends. Having

helpful peers at school was a significant protective factor for suicide attempts only among rural adolescents.

Discussion

The results of the study revealed that suicidal plans and attempts are not uncommon among Mongolian adolescents. More than 16% of female and 12% of male students reported that they had seriously considered suicide and 11.4 % of female and 8.1% of male students attempted suicide in the past 12 months. Self-reported suicidal plans and attempts among Mongolian adolescents were 12.8%

Table 5. Characteristics associated with suicidal attempts by residential location, multivariate results

	Total			Urban			Rural		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Demographics and socioeconomic factors									
Gender: Women	1.87	1.48–2.37	<.0001	1.96	1.39–2.75	<.0001	1.79	1.29–2.48	.0001
Distress factors									
Feeling lonely									
Never	–	–	–	–	–	–	–	–	–
Rarely	.99	.70–1.39	.93	.82	.49–1.37	.45	1.14	.72–1.81	.58
Sometimes	1.18	.85–1.63	.33	1.17	.72–1.91	.53	1.16	.74–1.81	.53
Most of the time/always	1.91	1.33–2.75	.0001	1.90	1.12–3.23	.02	1.90	1.13–3.15	.01
Feeling worried									
Never	–	–	–	–	–	–	–	–	–
Rarely	1.95	1.44–2.66	<.0001	1.75	1.11–2.75	.02	2.16	1.43–3.27	<.0001
Sometimes	3.05	2.20–4.24	<.0001	3.08	1.90–5.01	<.0001	3.06	1.96–4.79	<.0001
Most of the time/always	7.68	5.17–11.42	<.0001	6.26	3.53–11.10	<.0001	9.65	5.55–16.76	<.0001
Risky behaviors									
Smoking cigarette	2.38	1.70–3.34	<.0001	2.77	1.77–3.34	<.0001	2.00	1.17–3.41	.01
Drinking alcohol	1.66	1.18–2.33	.003	1.28	.79–2.06	.32	2.32	1.43–3.75	.001
Physical fight	1.81	1.43–2.30	<.0001	1.52	1.43–2.30	.02	2.12	1.53–2.93	<.0001
Missed class	1.31	1.03–1.67	.03	1.43	1.00–2.04	.05	1.22	.87–1.71	.24
Peer relationships									
Having friends									
No friends	–	–	–	–	–	–	–	–	–
1–2 friends	.72	.49–1.06	.09	.92	.51–1.65	.78	.59	.35–.98	.04
3 or more	.41	.28–.59	<.0001	.49	.28–.86	.01	.35	.21–.57	<.0001
Peers helpful	.84	.66–1.06	.15	1.04	.72–1.48	.85	.70	.51–.97	.03
Bullied	1.44	1.14–1.82	.002	1.45	1.03–2.05	.03	1.44	1.04–1.99	.03
Residential locations									
Rural	–	–	–	–	–	–	–	–	–
Urban	1.16	.94–1.45	.17	–	–	–	–	–	–

Note. (–) Reference category.

and 8.7%, respectively, in 2010 (Altangerel et al., 2014) and our current findings indicate increases in 2013 data (14.7% and 10%). Moreover, these numbers are higher than many other Asian countries, for example, 6.7% of Chinese (Li, Zhang, Li, Li, & Ye, 2012) and 9.1% of Japanese (Lie & Liou, 2014) adolescents reported suicidal plans, and 4.9% of adolescents in the Philippines (Page et al., 2011) reported suicidal attempts. Overall, adolescents who resided in urban areas were more likely to report suicide plans and attempts than their rural counterparts. A few studies have replicated these findings in Asian populations (Choi & Kim, 2015; Najafi, Hasanzadeh, Moradinazar, Faramarzi, & Nematollahi, 2013; Razvodovsky & Stickle, 2009; Yip, Callanan, & Yuen, 2000).

The current results indicated that females reported more suicidal plans and attempts than males did, a finding similar to those from a myriad of previous studies (Albers & Evans, 1994; Altangerel et al., 2014; Kang et al., 2015). Other demographic factors such as school grades, living situations, and being hungry were not significantly associated with suicidal plans and attempts in the current sample. This is in contrast to the results from Altangerel and colleagues (2014), who reported that students being hungry due to not having food at home was significantly associated with suicide attempts.

The study also indicated that feeling worried was the strongest predictor of suicidal plans and attempts among Mongolian adolescents. Similar results have also been

reported in other Asian populations. For example, adolescents who felt anxious and worried were 8 and 6 times more likely to have suicidal ideation in Indonesia and Philippines, respectively (Lie & Liou, 2014). Anxiety has also been highlighted to be a major risk factor for suicidality in Western cultures (Fergusson, Woodward, & Horwood, 2000; King et al., 2001; Strauss et al., 2000; Thompson, Mazza, Herting, Randell, & Eggert, 2005).

Risky behaviors such as drinking alcohol, smoking cigarettes, fighting at school, missing classes, and being bullied were also identified as significant predictors of both suicidal plans and attempts in this study. These findings were also consistently reported in other adolescent samples across multiple countries. For instance, Fleming and Jacobsen (2010) reported that younger students, particularly boys who were bullied, endorsed increases in suicidal ideation in 19 different low- and middle-income countries. In a Chinese adolescent sample, it was also found that students who fought in school were at a significantly higher risk for suicidal behaviors (Cui, Cheng, Xu, Chen, & Wang, 2011). Other studies have found significant associations between exposure to bullying, either as a victim or perpetrator, and suicidal behavior (Hinduja & Patchin, 2010; King & Merchant, 2008; Klomek, Marrocco, Kleinman, Schonfeld, & Gould, 2007). Generally, substance use such as alcohol use and smoking have been found to be significant factors for suicidal behaviors across populations (Bossarte & Swahn, 2011; Hawton, Saunders, & O'Connor, 2012; Kokkevi, Rotsika, Arapaki, & Richardson, 2012; Pompili et al., 2012).

Having friends, especially three or more, represented a significant protective factor against adolescent suicidal plans and attempts. Generally being treated in a kind and helpful way by peers was additionally protective. Previous studies have reported similar findings in that having friends and peer support were found to reduce rates of suicidal behavior in adolescence (Gallagher, Prinstein, Simon, & Spirito, 2014).

Overall, there were not many differences in the patterns of risky behaviors, distress factors, peer relationships, and demographics related to suicidal plans and attempts among urban and rural students in Mongolia. Furthermore, the patterns of associations appear to be ubiquitous across different countries.

High rates of suicide plans and attempts among Mongolian adolescents prompt an urgent need for evidence-based, culturally relevant, suicide prevention and interventions that target high-risk adolescents in Mongolia, regardless of residence; yet, to date, no such programs exist. Stigma surrounding suicide and the lack of public understanding, education, and essential medications for treatment present significant barriers to providing necessary treatment and support. Additionally, community-based care, mental

health education, and training for medical doctors, welfare workers, and local administrators are almost nonexistent. Moreover, no psychiatrists or other mental health professionals that specialize in children's mental health exist in Mongolia. Public understanding of suicide is very limited and most people do not believe that suicidal behaviors are related to mental illness. The mental health infrastructure in Mongolia is underdeveloped, and the quality of care does not meet international standards.

The findings regarding risky behaviors highlight the value of preventive programs that would target these risky behaviors early in the student's experience, perhaps at the elementary school level. This may reduce subsequent suicidal thoughts and behaviors in adolescence. Evidence-based preventive interventions may be implemented during the health behavior curriculum provided at the elementary level. Furthermore, the results regarding protective factors also suggest that school environments may be important locales for enhancing protective factors for students. Schools could emphasize the importance of social support from peers and implement antibullying campaigns to reduce suicidal plans and attempts.

On the basis of our findings and the current underdeveloped state of the mental health infrastructure of Mongolia, we recommend that more resources be dedicated to developing a sustainable mental health infrastructure to support adolescents. For example, providing enhanced education to professional service providers may help in the early identification of individual factors that could prompt an intervention. Furthermore, throughout urban areas in Mongolia adolescent service centers exist. However, these centers do not currently provide mental health services. This is an area ripe for change. Funding for social workers, psychologists, and other public health professionals dedicated to the delivery of individual, family, and group-based services is much needed given the high rates of suicide plan and attempts among Mongolian youth.

Strengths and Limitations

GSHS was a large, nationally representative survey collected by the WHO and the Centers for Disease Control. The GSHS is globally recognized and implemented, providing highly generalizable data and findings. Schools and students were randomly selected from both urban and rural areas. However, several limitations in the GSHS need to be noted. First, there are no reliability and validity studies examining GSHS items within the context of Mongolian culture. Second, there are a number of critical variables not included in the questionnaire such as depression, family and parental support, and the following theoretically

relevant demographic factors: household income, marital status of parents, parental education level, and other familial constructs that may influence student-reported suicide risk. Third, because the school and class level data were de-identified, we could not take the design clustering with schools and classes into consideration, nor could we examine academic environments as possible correlates of suicidal behavior.

Conclusion

Suicidal ideation and behaviors are not uncommon among Mongolian adolescents. Findings speak to the necessity of developing and implementing a range of potential interventions or programs that may alleviate some of this concern and point to venues, including adolescent centers, for delivering such programming. This would also include the provision of mental health services for high-risk adolescents to prevent suicidal ideation and behaviors. As noted, there are a number of study implications that may improve the status of mental health for adolescents. All of these require both political and community will as well as allocation of requisite resources on behalf of students and families. We hope that these findings and our recommendations become a starting point for critical conversations and action to be taken on behalf of Mongolian youth.

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