



Drug Addiction and Substance Use Among the Dalit Married Adolescent Girls in Bangladesh: a Cross-Sectional Survey

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Abstract

Dalits are referred to “shattered,” “outcasts,” and socially marginalized community in Bangladesh. In particular, Dalit adolescent girls are the most vulnerable owing to their caste and gender. Prior studies have looked at the prevalence and effects of drug addiction among the youths in mainstream population, but the Dalit adolescents were excluded from the samples. The study aimed to investigate the prevalence of drug addiction and substance use among the Dalit married adolescent girls (MAGs), and to identify the significant predictors associated with this addiction. A cross-sectional survey was carried out among 300 MAGs in the Dalit community. Involving systematic random sampling, participants were selected from both urban and rural settings located in Dhaka and Gaibandha districts. Bivariate and multivariate logistic regressions were performed to explore the significant factors associated with drug addiction. The prevalence of drug addiction was 11.3% among married Dalit adolescent girls. Multivariate analysis identified that participants’ habit of smoking ($AOR=5.210$, 95% $CI=2.413–11.250$), participant’s husband’s habit of smoking ($AOR=10.415$, 95% $CI=3.911–27.739$), and habit of using alcohol/highly risky substances ($AOR=19.030$, 95% $CI=6.481–55.875$) were significant associated with drug addiction. An alarming proportion of Dalit adolescent girls were recorded to be habituated in various forms of drugs use. Therefore, immediate policy measures focusing intensive campaigns, targeted counseling, and health education programs need to design to get over the risky health behaviors.

Keywords Married adolescent girls · Dalit community · Drug addiction · Substance use · Smoking · Risky behaviors

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Background

Adolescence is a crucial period of life when children undergo significant physical, cognitive, and psychosocial changes. This is a unique stage between childhood and adulthood and is characterized by inquisitiveness and curiosities. At this stage, the adolescents start experimenting new ideas about life styles, and in turn make choices that may lead to risky behaviors and mental health problems. In some cases, these experimental attitudes often propel adolescents to start using drugs, tobacco, or even illicit substance (Center on Addiction and Substance Abuse 2011; Fettes et al. 2013; Khan et al. 2020; Shazzad et al. 2013). Adolescent girls in developing countries are more vulnerable due to their status and social norms. During puberty, girls are susceptible to depression which is a significant predisposing factor for initiating illicit drugs and substance use, as well as other risky health conducts (Jackson et al. 2015; Tschann et al. 1994; Rohrbach and Milam 2002; World Health Organization 2004; Silberg et al. 2003; Kiesner et al. 2010). Several studies suggest that the extent of drug use among younger population is higher than that of older groups. Moreover, the gender gap in substance use continues to shrink (Fettes et al. 2013; Johnston et al. 2007) in recent years, and in some cases, adolescent females surpasses their male counterparts (Johnston et al. 2007).

Most research suggests that either early adolescence (12–14 years old) or the older age group (i.e., 15–17 years old) are particularly sensitive periods for the initiation of substance use (DiClemente et al. 2001). Many young people use drugs to cope with the social and psychological challenges that they may experience during different phases of their development from late adolescence to adulthood.

Globally, substance use is the leading cause of disability among adolescents which is responsible for a quarter of all years lived with disability (YLD) (54.2million) (Erskine et al. 2015). In Bangladesh, drug addiction is prevalent especially among urban youths (Shazzad et al. 2013). Near about 2.5 million people are estimated to be drug addicted—among them around 80% are adolescents and young men of 15 to 30 years of age. The Global Burden of Disease (GBD) reported that the burden attributable to substance use is substantially high in adolescents and young populations. In young men aged 20–24 years, alcohol and illicit substance use are responsible for 14% of total health burden.

There are many factors at the personal, social, economic, physical, and environmental levels that can interplay making young people more vulnerable to substance use. Major risk factors which can enhance the risk for initiating or continuing substance abuse are family disorganization, parental neglect, parent-child conflict, peer group influence, lack of emotional support, easy availability of drugs, etc. Moreover, low parental monitoring and a hostile home-environment are also strongly correlated with substance use among adolescent girls (DiClemente et al. 2001; Hanchett 2018).

It is estimated that alcohol abuse alone results in yearly deaths of 2.5 million, whereas the addiction for cocaine or heroin is responsible for at least 0.2 million deaths per year. Moreover, substance abuse is also responsible for significant morbidity, and the overall cost of health care creates a tremendous burden on the family, society, and eventually on the health systems. The United Nations Office on Drugs and Crime (UNODC) estimates that worldwide costs related to treating drug abuse total >\$250 billion, or 0.3–0.4% of global GDP (gross domestic product) (Fettes et al. 2013). Many studies indicated that poor health, suicide, mental illness, and decreased life expectancy are all common outcome due to addiction and substance uses (Erskine et al. 2015; Center on Addiction and Substance Abuse 2011).

Drug consumption affects young people of every country in the world. In Bangladesh, drug addiction and substance use are widespread, both in rural and urban areas. Although all segments of the society are affected by this problem, poor and marginalized populations, including Dalit community, are under greater risks. The term “Dalits” meaning “broken” also known as “untouchables” is a socially disadvantaged minority group in Bangladesh who are excluded from the mainstream, facing discrimination in employment, housing, education, and access to the basic services. Especially, Dalit girls and young women are the most oppressed, owing to their caste, gender, and low status (Shivkumar 2013; Rowshan et al. 2016). Poverty, high rates of illiteracy, child marriages, early motherhood, and endemic gender and caste discrimination often force Dalit girls and young women to embark on drug use and other risky sexual behaviors (Rathore 2018). In this regard, Dalit married adolescent girls (MAGs) are often found to be more influenced by their husbands, who are also habituated in drinking, smoking, and other substance abuse (Hasam and Mushahid 2017). Although studies were undertaken to ascertain the causes and effects of drug addiction among urban youths of Bangladesh (Rahman et al. 2016; Shrivastava and Tanchangya 2015), however, to the best of our knowledge, no studies have ever conducted on identifying the extent of drug addiction and substance use among Dalit adolescents (Silberg et al. 2003; Rowshan et al. 2016; Hasan 2018). We, therefore, specifically designed and conducted this study to determine the prevalence of drug addiction, and its determinants among the MAGs in Dalit community of Bangladesh.

Methods

Ethics

The study protocol was reviewed and approved by the Faculty of Allied Health Sciences, Research Ethics Committee of Daffodil International University (FAHS-REC, DIU). Administrative approval was obtained from the local authorities for the site visits. The Local Dalit Association was also engaged. Prior to commencing the data collection, we explain the study objectives and took the assent from participants (in the case of aged < 18 years) and consent either from household head/husband or father. Written informed consent was taken from each participant before the interview.

Study Design and Setting

We conducted a cross-sectional survey (Fig. 1) among Dalit adolescents in two randomly selected areas considered the hub or concentrated centers of Dalit population, located in Gaibandha District (rural setting) and Dhaka city (urban setting) of Bangladesh. Although there is a lack of national data on the Dalit population, it is estimated that there are approximately 5.5 to 6.5 million of Dalits in Bangladesh, scattered around 7 districts including the capital Dhaka city (One World Action and Nagorik Uddyog 2011; Community 2015). Socially, Dalits are neglected, disadvantaged, and marginalized community. They are engaged in lower class menial jobs and therefore financially destitute. With an illiteracy rate of 96%, Dalits face difficulties accessing to education, development, and even to health services (One World Action and Nagorik Uddyog 2011). There are two types of Dalit ethnic groups in Bangladesh: Bengali Dalit (speak Bengali) and Non-Bengali Dalit (speaks Telugu, Hindi, etc.)

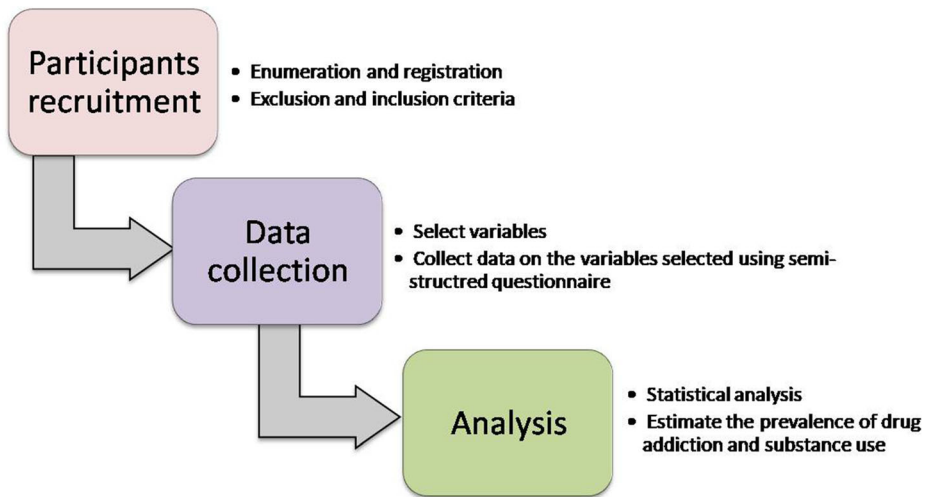


Fig. 1 Study design—cross-sectional study

with different religions like Hinduism, Christianity, or Islam. Furthermore, they have different sub-caste groups, especially among Hindus, and professions (Community 2015). This varied degree of heterogeneity made it difficult in selecting participants for the study.

Study Participants

The study participants were the Dalit MAGs aged between 10 and 19 years. Since the Dalits are marginalized and excluded from the mainstream society, Dalit women, especially, are strictly confined in their location of residence because of their social standing within their community and beyond; they were left out from the local reproductive health care services (One World Action and Nagorik Uddyog 2011). As a result, no list of married Dalit adolescents was available from the local health centers of the study areas. Therefore, prior to gathering actual data, we visited the selected urban and rural study areas to enumerate and register the Dalit MAGs who fulfilled the age criteria (Fig. 2). Any married women outside of the age group were excluded.

Sampling and Sample Approaching

Figure 2 schematically shows the sampling process and the outcome of samples at each stage. During enumeration, we prepared a list of all possible Dalit MAGs from the two study areas before data collection. In that process, a total 817 Dalit MAGs were enlisted and registered. Then, after following the exclusion criteria, a list of 784 Dalit MAGs was drawn-up. Using the sampling frame, we systematically selected 300 participants for data collection. Every alternate married adolescent was chosen as a participant. However, during data collection, we found that around one-fourth of the participants in the sampling frame were not available while visiting their house. This is because of the fact that the selected participants were not at their home due to their work commitments. In order to mitigate the challenge and to fulfill the sample size, the next participants in the frame who met the inclusion criteria were interviewed. We also

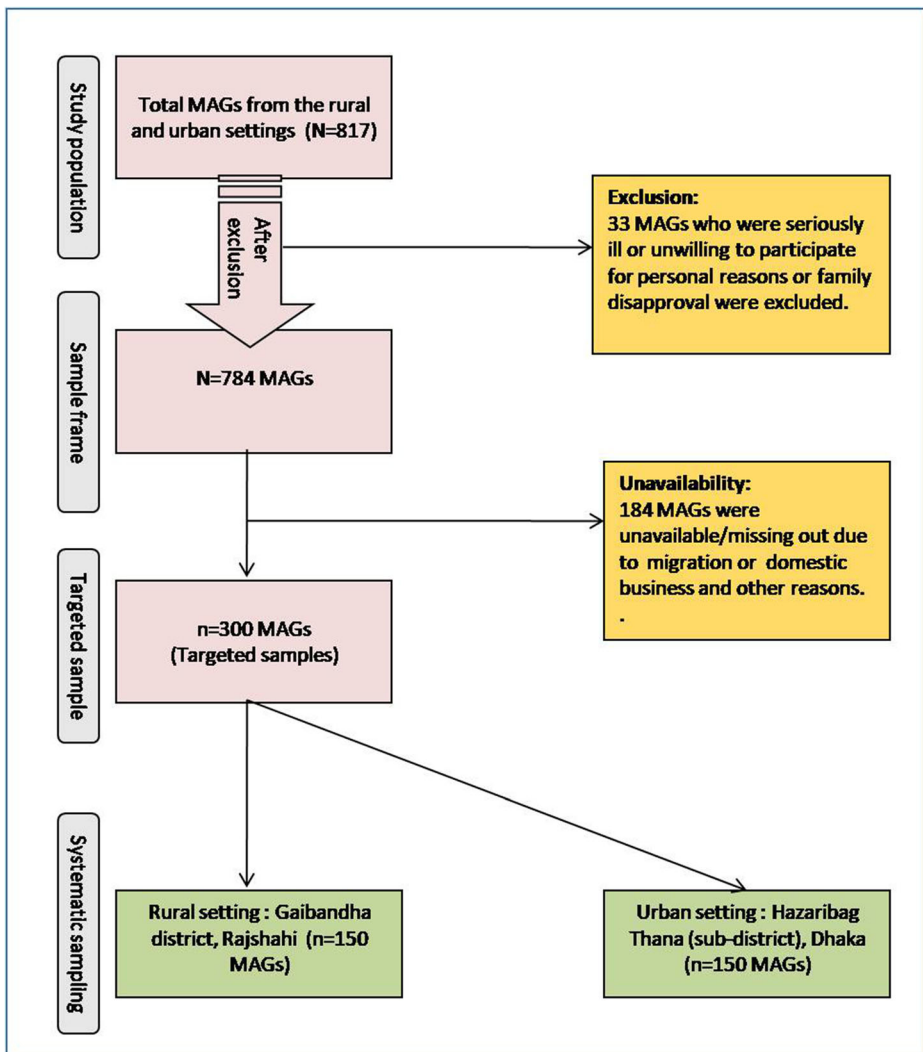


Fig. 2 Sampling process and samples

followed the participants' convenient time to ensure maximum participation and at least two visits were made to reach the desired samples.

Data Collection

Data were collected through face-to-face interviews by using a semi-structured questionnaire. Although there were some structured questions, the questionnaire included open-ended questions to capture insights and deep-seated views and opinions. There were also discussion with community leaders to gather communal views on drug addiction and substance use among Dalit populations.

The investigators of the study developed the questionnaire which was reviewed by the technical experts and the other team members and then finalized after pretesting among the non-sampled Dalit MAGs girls in study areas. During pretesting, we also checked the validity, appropriateness, and consistency of the variables used in this study. The questionnaire was initially prepared in English and subsequently translated to Bengali for field use.

Considering the social norms and to increase the response rate, we recruited only female interviewers in this study, and the interview was conducted with utmost privacy and confidentiality. The interviewers were properly trained before data collection. On an average, the interviews lasted from 30 to 40 mins. When the selected participant expressed her initial consent, the interviewers explained the study in details, and gave the participants enough time to consider whether to participate in the study or not. The questions were asked and explained in local language after obtaining a written consent.

Study Variables

We applied an exploratory approach to identify the risk factors associated with drugs and substance use by the Dalit MAGs from other settings (Fernando et al. 2014; Theme-Filha et al. 2016; Vázquez-Nava et al. 2014; Sayem and Nury 2011). This process gave us a range of factors such as socioeconomic circumstances, connectedness to family, family setting, partner characteristics, and education level that had influence or acted as potential risk factors for adopting risky health behavior by MAGs. These variables were also cross-checked with similar contemporary studies carried out in Bangladesh (Laws of Bangladesh. Guardianship for marriage in Bangladesh. Muslim Marriage and Divorces Registration Act 1974) and other studies conducted in similar settings and context (Theme-Filha et al. 2016; Vázquez-Nava et al. 2014; Sayem and Nury 2011) to ensure their validity and relevance.

The dependent variable was the status of drug use among the Dalit MAGs which was categorized as “yes” and “no.” In the context of our study, usage of drug constituted of consumption of illegal substance such as Yaba, Phensedyl, spirit, *Cannabis*, marijuana, and heroin acquired without any legal prescription. Yaba is locally known as “madness drug” which is a combination of methamphetamine and caffeine (WHO, 2016). To explore and identify the factors affecting the initiation and continuation of drug use, the following categories of variables were considered:

- *Demographic and socio economic profile:* Age and educational levels of participants and their parents and husbands were considered, which was dichotomized as literate and illiterate. Occupational status of participants’ fathers and husbands were probed, which was classified as employed or unemployed, which was sub-classified as government service and private sector jobs. The types of jobs were also collected. Other socioeconomic variables were monthly family income (Bangladeshi Taka (BDT) $\leq 15,000$ or $\geq 16,000$)¹, family size, pattern of living (husband’s/in-laws house=1, parent’s house=2), and age during marriage. We then probed the marriage circumstances further, varied between forced marriages to arranged marriage to voluntary selection of partners—the value of these variables were forced by parents=1 and voluntary=2.
- *Smoking and drug uses by the participants:* Variables like status of smoking tobacco by participants, prevalence of drug use (yes/no), types of drug used (Yaba, Phensedyl, spirit,

¹ 1 US Dollar = 85 BDT

Cannabis, marijuana, heroin), and frequency of drug use (frequently, occasionally, never) were investigated. Also, duration of drug use was noted.

- *Smoking and drug uses by their husbands*: Status of smoking tobacco and participants' husband's drug use (yes/no), type of drug uses (Yaba, Phensedyl, spirit, *Cannabis*, marijuana, heroin), frequency (frequently, occasionally, never) and how long they were using the drugs were investigated.
- *Factors associated or influenced the initiation and continuation of drugs and substance use*: The participants' opinion and views about the reason of initiation and continuation of drugs and substance use was explored in details. Probing questions were used to find out the insights of their individual circumstances.

Field Data Management

Since the study was conducted among the minority so-called 'untouchable' community, we met with the leaders of Dalit community prior to commencing data collection to explain the study objectives and to get their verbal consent. Then, we clearly explained the study objectives to the participants in order to comply with all possible ethical issues. The participants were made aware that the participation was absolutely voluntary and could be terminated at any time without any reason or any obligation. They were also ensured that all their personal information would be preserved with strict confidentiality. An informed consent was taken from all participants before interview. However, in the case of pregnant girls aged <18 years, an additional written consent form was obtained from their legal guardian. In Bangladesh, the husband is considered legal guardian of a wife after marriage according to the existing laws (Cherry 2016). Moreover, we obtained formal permission from the head of the family while entering each household.

Data Analysis

Data underwent a range of checks and cleaning prior to analysis. Utmost attention was given to identify any irregularities within the data, so as to increase its credibility and robustness. Based on data consistency and presence of missing values, necessary screening of explanatory variables was done. After proper data coding, we performed descriptive statistical analyses using SPSS (Statistical Package for Social Science) software. We explored the relationship between dependent and independent variables by applying the analytical methods such as descriptive statistics, binary regression, and multivariate logistic regression. The regression model was used to identify those explanatory variables which were the most statistically significant, i.e. those variables which yielded statistically significant difference between drug addiction and non-addiction. However, through the logistic regression analysis, we deliberately wanted to determine whether exposure to specific risk factors correlate with particular outcomes, not to show the cause-effect relationship. The correlations were then validated based on the evidence from studies of similar context (Laws of Bangladesh. Guardianship for marriage in Bangladesh. Muslim Marriage and Divorces Registration Act 1974; Von Elm et al. 2014). Odds ratios (OR) and 95 % confidence intervals (CI) were calculated, and planned pregnancy is taken as the reference category considering 5% significance level. Results of bi-variate and multi-variate logistic analysis are presented in Tables 1 and 2.

Table 1 Socio-demographic characteristics of the participants

Participants' characteristics	Frequency	% distribution
Age (years)		
13 years or below	48	16.0
14–16 years	252	84.0
Mean ± SD	14.76 ± 1.056	
Education level		
Primary or below	178	59.3
Above primary	122	40.7
Husband's occupational status*		
Unemployed	80	26.7
Occupation	220	73.3
Fathers' occupational status		
Unemployed	38	12.7
Occupation	262	87.3
Monthly family income		
15,000 BDT or below	116	38.7
Above 15,000 BDT	184	61.3
Mean ± SD	15790.00 ± 1736.650	
Family size (member)		
5–6	184	65.3
7–8	116	34.7
Living status		
With parents	31	10.3
With husband	269	89.7
Age of marriage		
13 years or below	196	71.7
14–19 years	104	28.3
Marriage circumstances		
Voluntary marriage	40	13.3
Forced marriage	260	86.7
Age during 1st pregnancy		
14 years or below	112	37.3
14–19 years	188	62.7

SD standard deviation

While reporting the findings, the study followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) recommendations for the reporting of cross-sectional research (Irudayam et al. 2006).

Results

Socio-demographic Characteristics of the Participants

Table 1 shows that majority of the participants (84%) were within the age group of 14–16 years with a mean (SD) of 14.76 (1.056) years. More than half of the participants (59.3%) had primary or below level of education. The occupational status of the participants' husbands (73.3%) and fathers (87.3%) were found to be mostly employed. Over half of the participants' (61.3%) monthly family income was above 15,000 BDT² (1 BDT is equivalent to 0.012 US

² The per capita income in Bangladesh is \$1466 (124,610 BDT) in the 2019–2020 fiscal year, according to the Bangladesh Bureau of Statistics (BBS).

Table 2 Adjusted risk factors associated with drug addiction among MAGs (n=300)

Characteristics/risk factors	Bivariate analysis OR (95% CI)	P-value	Multivariate analysis AOR (95% CI)	p-value
Age (years)				
13 or below ^{RC}	1.00		1.00	
14–19	0.860 (0.316–2.342)	0.769	0.493 (0.132–1.838)	0.292
Participant's education				
Literate ^{RC}	1.00		1.00	
Illiterate/can sign only	1.032 (0.503–2.118)	0.932	1.024 (0.442–2.373)	0.956
Participant's husband's education				
Literate ^{RC}	1.00		1.00	
Illiterate/can sign only	1.177 (0.581–2.383)	0.652	0.818 (0.282–2.370)	0.712
Participant's father's education				
Literate ^{RC}	1.00		1.00	
Illiterate/can sign only	0.795 (0.287–2.200)	0.659	0.741 (0.251–2.188)	0.587
Participant's husband's occupational status				
Had occupation ^{RC}	1.00		1.00	
Unemployed	0.946 (0.423–2.116)	0.892	0.841 (0.290–2.441)	0.751
Participant's father's occupational status				
Had occupation ^{RC}	1.00		1.00	
Unemployed	1.172 (0.425–3.232)	0.759	1.175 (0.415–3.331)	0.762
Monthly family income				
15,000 BDT or below ^{RC}	1.00		1.00	
Above 15,000 BDT	1.804 (0.889–3.663)	0.102	1.701 (0.817–3.540)	0.156
Family size (member)				
5–6 ^{RC}	1.00		1.00	
7–8	2.310 (0.972–5.486)	0.058	2.377 (0.960–5.887)	0.061
Living status				
Parents house ^{RC}	1.00		1.00	
Husband's house	0.493 (0.112–2.163)	0.349	0.520 (0.116–2.330)	0.392
Married circumstances				
Voluntary ^{RC}	1.00		1.00	
Forced by parents	1.731 (0.504–5.942)	0.383	1.803 (0.510–6.366)	0.360
Age during the marriage (years)				
<13	0.845 (0.394–1.812)	0.666	0.822 (0.334–2.023)	0.669
14–19 ^{RC}	1.00		1.00	
Age of sexual debut				
15 or above	1.00		1.00	
14 or lower ^{RC}	0.673 (0.332–1.366)	0.273	0.662 (0.297–1.479)	0.315
Participant's habit of smoking				
No ^{RC}	1.00		1.00	
Yes	4.876 (2.329–10.209)	0.000	5.210 (2.413–11.250)	0.000
Participant's husband's habit of smoking				
No ^{RC}	1.00		1.00	
Yes	9.242 (3.702–23.072)	0.000	10.415 (3.911–27.739)	0.000
Participant's husband's habit of using alcohol/highly risky substances				
No ^{RC}	1.00		1.00	
Yes	18.922 (6.461–55.415)	0.000	19.030 (6.481–55.875)	0.000
Drinking of alcohol by husband during sexual intercourse				
No ^{RC}	1.00		1.00	
Yes	2.486 (0.996–6.207)	0.051	1.840 (0.685–4.940)	0.226

OR odds ratio; AOR adjusted odds ratio; CI confidence interval; AOR adjusted odds ratio; RC reference category

Dollar approx.) with mean (SD) of 15,790.00 (1736.650) BDT, and nearly three-quarter of the participants (65.3%) have a family consisting of 5–6 members. Most of them (89.7%) were living with their husband. Around three-quarter of the participants (71.7%) age of marriage

was 13 years or below and majority of the participants' (62.7%) were within the age range of 14–19 years when they were 1st pregnant. Lastly, almost 90% of the participants (86.7%) were married forcefully.

Figure 3 depicts the educational status of the respondent's husband and parents. It can be seen that more than half of the participant's husband (55%) had primary and above educational level, whereas more than half of the participant's father (51%) and mother (55%) were illiterate.

Figure 4 shows that 16.7% of the participants were smokers and more than two-thirds of their husbands (68%) were found to be smoking tobacco products.

Figure 5 shows that prevalence of drug use among the Dalit MAGs was 11.3% with Phensedyl (32%) being the highest followed by marijuana (26%), spirit (18%), Yaba (15%), and heroine (9%) being the least.

Figure 6 illustrates the frequency distribution of participants' husbands' drug addiction and the pattern of drugs they used. With more than three-fifths of the participant' husbands being drug users (61%), it is interesting to note that over half of them were alcoholics as well (52%). Marijuana comprised of a quarter of drug users (25%) followed by Phensedyl (23%).

Factors Associated with Drug Addiction Among Dalit MAGs

The study included sixteen variables in the bivariate analysis of which participants' monthly family income, family size, married circumstances, participant's habit of smoking, participant's husband's habit of smoking, husband's habit of using alcohol/highly risky substances, and drinking alcohol by husband during sexual intercourse were all associated with drug addiction in the Dalit MAGs (Table 2).

All the sixteen variables were included in the multivariate model. From the multivariate analysis, after adjusting for possible confounders, some explanatory variables were found to be highly associated with drug addiction among Dalit MAGs. It was clearly evident that participants who had smoking habits were more than five times more likely (AOR=5.210, 95% CI=2.413–11.250) to have drug addiction compared to the non-smokers. Similarly, participants whose husbands were smokers were >10 times more likely to take up drugs

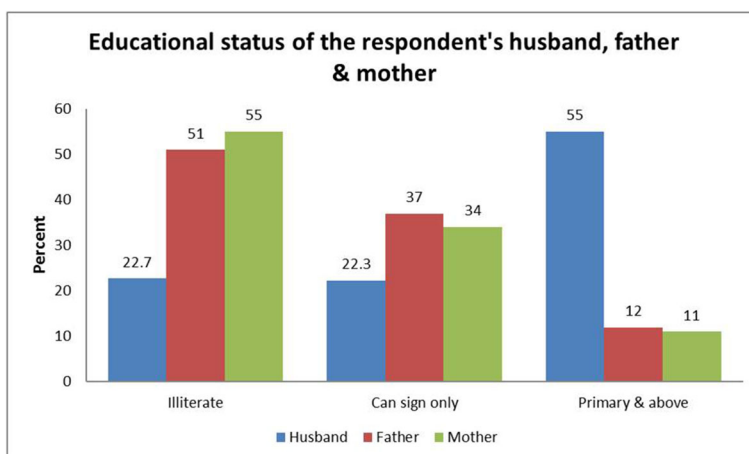


Fig. 3 Educational status of the participants' and their husband and parents

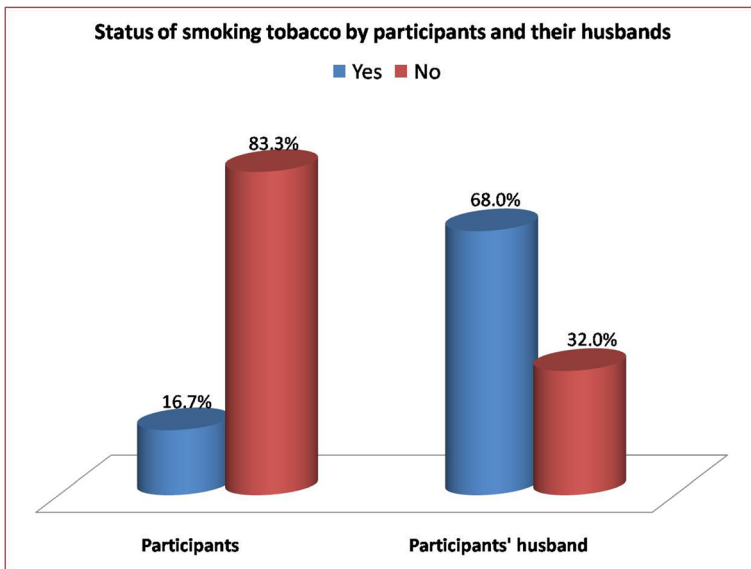


Fig. 4 Status of smoking tobacco by participants and their husbands

(AOR=10.415, 95%CI=3.911–27.739) compared to participants with non-smoking husbands. Likewise, odds of drug addiction were 19 times higher in participants with alcoholic/high risky substance user husbands compared to participants whose husbands were non-alcoholic/non high risk substance user (AOR=19.030, 95% CI=6.481–55.875).

Participants with larger family size (7–8 members) were almost 2.5-fold more likely to get addicted (AOR=2.377, 95% CI=0.960–5.887) compared to their smaller family size counterparts (participants with <6 family members). In addition, participants whose husbands consumed alcohol during intercourse were almost 2-fold more likely to get addicted to drugs compared to participants whose husband did not (AOR=1.840, 95% CI=0.685–4.940). Furthermore, the odds of drug addiction were 1.803 times more in MAGs who were forced to marry compared to those who married voluntarily. The odds of MAGs who had monthly family income of above 15,000 BDT (AOR=1.701, 95% CI=0.817–3.540) were at a greater risk of drug addiction compared to participants who had family income below 15,000 BDT.

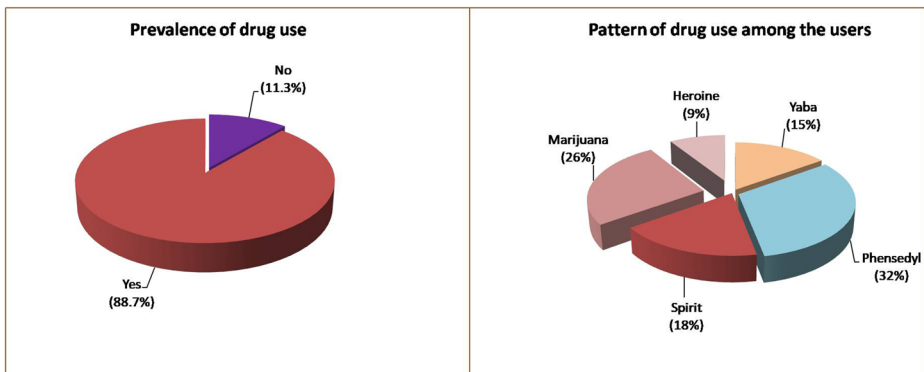


Fig. 5 Prevalence and pattern of drug use by the participants

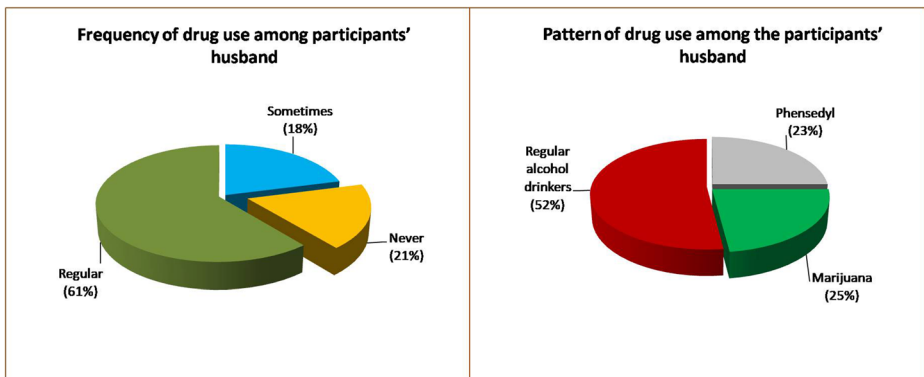


Fig. 6 Percentage distribution of frequency and pattern of drug use by participants' husbands

From the multivariate analysis (Table 2), it was observed that variables such as age, participants; education, husband's education, occupational status, father's education and occupation, living status, age of participant's during marriage, married circumstances, and sexual debut were not significant predictors to the involvement with drug addiction in MAGs in Dalit community.

Discussion

Dalit is traditionally referred to as “untouchables” or “outcasts” who are one of the most neglected and marginalized communities in South Asia. The term “Dalit” which means “broken” belongs to the lowest social quintile of the populations (Sultana and Subedi 2016). Although this caste-based system predominantly exists in India, it is also somehow practiced in Bangladesh as well (Sultana and Subedi 2016; Islam 2011). Total Dalit population is nearly 6.5 million, comprising of more than eighty casts and sub-casts (Macfarlane et al. 1987). Even though the whole Dalit community is oppressed by and large, it is the Dalit women who are placed at the absolute bottom of both caste and gender hierarchies (Rathore 2018; Macfarlane et al. 1987). Regrettably, Dalit women are subject to various types of discrimination, harassments, and other human rights violations and are mostly neglected in the society. However, their voices hardly get any attention both at the national and international levels (Rathore 2018).

One of the main findings of our study was the strong association between smoking habits of participants and drug addiction. Smoking among Dalit MAGs were five times more likely (AOR=5.210, 95% CI=2.413–11.250) to have drug addiction compared to non-smoking participants. The strong association can be also observed from the CI of the odds ratio. The CI does not include 1 which indicates a very strong association between participants smoking status and drug addiction in MAGs. This finding is consistent with previous studies (Lai et al. 2000; Torabi et al. 1993; Martin et al. 1996) which reported that adolescent smoking is strongly associated with illicit substance use. Likewise, another study conducted in the USA stated that smoking was positively associated with drug use in married adolescents and women (Homish et al. 2007).

Another variable which had even greater association with drug addiction was the smoking status of participants' husbands. The multivariate analysis revealed that the odds of drug

addiction in MAGs was 10.42 times more likely in participants with smoking husbands (AOR=10.415, 95% CI=3.911–27.739) compared to their counterpart as non-smoking husband. Again, the CI does not include 1 which indicates a very strong association between husbands' smoking status and drug addiction in MAGs. Our findings are in similar vein to another study where husbands' smoking and marijuana habits proved to be a strong predictor of subsequent drug addiction among their wives (Amaro et al. 1989). The most influential explanatory variable for drug addiction was participant's husband's habit of using alcohol/highly risky substances. The odds of drug addiction were almost 20-fold higher in participants whose husbands were either alcoholic or a drug/substance user compared to those who had non-alcoholic husbands or husbands who are not habituated with any high-risk substances (AOR=19.030, 95% CI=6.481–55.875). The 95% CI for the AOR does not include 1, which indicates that a strong positive association exists between husbands' alcoholic habits or risky substance use and drug addiction in MAGs. Again, the findings of our study are supported by several studies which reported that drug addiction in husband induces addiction among their spouses (Rosenbaum 1981; Hser et al. 1987; Killen et al. 1997). These studies unequivocally stated that married teenage girls with addicted male partners/husbands were at greater risk in terms of initiation and continuous use of drugs. Possible explanations for spousal influence were social dominance of male partners on their spouses, and the choice of female partners who are vulnerable and subject to assortative mating (Amaro et al. 1989). Individuals would choose partner who are similar with regard to behavior, physical traits, or even health. In most cases, the female partners would initiate smoking or substance use in order to be compatible with husbands/intimate male partners who are already smoker or addicted to various drugs (Kastbom et al. 2015).

Contrary to our findings, age of sexual debut can act as an influential variable in the drug addiction in adolescent girls. Even though our finding may suggest that a negative association exist between early initiation of sex and drug addiction, a large trial conducted in Sweden revealed that early sexual debut (before the age of 14) was positively correlated with not only drug and alcohol use, but with antisocial behaviors as well (Kandel 1975).

Likewise, our study had a negative association between age and drug addiction, i.e. drug addiction decreases with age which was quite puzzling. Evidence suggest that adolescents advance from cigarette smoking to alcohol, and subsequently get involved in drugs such as marijuana, heroin, and other illicit drugs—a phenomenon known as the “gateway theory” (Kandel and Logan 1984; Lemstra et al. 2008; Hanson and Chen 2007).

The socioeconomic variables (participant's education, husband's education and occupational status, father's education and occupational status, monthly family income) were found to be insignificant factors, and had little association with drug addiction among Dalit MAGs. Although it is widely acknowledged that higher socioeconomic status (SES) is strongly correlated to good health and vice versa, prior studies reveal mixed reviews. A meta-analysis of American and European studies reported that adolescents having lower SES had a positive association with marijuana and alcohol (Hanson and Chen 2007). On the other hand, findings from a Canadian study revealed that the teen-aged adolescents of high SES were more inclined towards substance use (Sedgwick 2015). We found that there were paucity of evidence to explain how different SES indicators influence substance use in Dalit MAGs and whether any SES marker had a stronger influence in addiction compared to the others. This can be an area of future investigation and research.

We found that previous studies, although limited in number, were mainly focused on the social, economic, and cultural aspects of Dalit community in Bangladesh (Rathore 2018; Islam

and Parvez 2013; Hasan 2018). Therefore, our study is potentially the first study which has investigated the prevalence of drug addiction among Dalit MAGs in Bangladesh, and identified various predictors associated with drug addiction and substance use. In our study, sixteen variables were examined to ascertain their association with drug addiction through bivariate and multivariate analyses. Our results revealed that the most significant variables to drug addiction were (i) participants' own habit of smoking, (ii) participant's husband's habit of smoking, and (iii) participant's husband's habit of using alcohol/highly risky substances. Hence, the future interventions should not only focus on the prevention of risky behavior among the Dalit MAGs, but also needs to take into account the influence of husbands or other intimate partners. Another positive aspect of our study is that we have categorically analyzed the association of SES indicators with drug addiction, and therefore, our results provided much more specific and overall indications rather than including a single marker of SES. As the study was carried out in both rural and urban settings, the study comparatively explored what is happening in regard to drug addiction and substance in both urban and rural areas, thereby would be helpful for generalization in other Dalit population settings. This study can also provide a platform to launch appropriate program interventions to address the issues related to drug addiction among Dalit community in Bangladesh and elsewhere.

There are a number of limitations in our study. Firstly, the sample size was drawn only from two geographical areas which may affect the generalization of the study findings. However, these two settings were considered the "hub" of the Dalit community, where most Dalit populations live in high concentrations. Secondly, selection bias might also occur in our study where a systematic difference might exist between the participants who were willing to be a part of the survey and those who were unwilling [51].

Conclusions and Recommendations

This study was an attempt to ascertain the prevalence of drug addiction and substance use among Dalit MAGs in Bangladesh and to identify the factors and predictors associated with the initiation and continuation of drug or substance use. It is worthwhile to understand the social and cultural context of Dalit girls and the multiple forms of discrimination and harassment that they are subjected to. The interesting and key finding from this study is the significant influence of their husbands/partners on their habits and behaviors. It is also evident that addictive behavior of husbands is a significant predictor for drug addiction among MAGs. Therefore, the policy makers should design a community-based holistic program targeting the Dalit adolescent girls but also address the smoking and addiction issues of their husbands or partners. The Government of Bangladesh should proclaim necessary laws to prevent the easy availability of cigarettes, drugs, and alcohol. The Government should also develop and implement policies to promote gender equity, education, and empowerment of Dalit women and adolescent girls, and to prevent early marriages. Lastly, efforts should be made by all concerned to ensure that Dalit community is integrated into the mainstream populations.

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Availability of Data and Materials All data generated and analyzed for this study are included in this article. We are happy to share the raw used or analyzed data of the study, and make them available publicly on reasonable request to corresponding author due to the confidentiality of the participants and ethical issues concerned.

Author Contribution MIH contributed to the development of the overall study concept, analysis, drafting of the paper, and helped improve the manuscript. VR designed the study and developed the questionnaire. ANZU reviewed the whole manuscript and contributed substantially to improve it, will act as corresponding author. IH contributed in second drafting of the manuscript and literature review. All other authors contributed equally in data collection, data analysis, and writing the manuscript. All the authors have read the manuscript thoroughly and approved its contents.

Declarations Ethics Approval and Informed Consent

As marginalized community, prior to commencing the data collection, we first met the community leader of Dalit community, and explained the study objectives and took their oral consent to collect information regarding the study topic. We then explained the study objectives clearly to the study. To comply with all possible ethical issues, the participants were also confirmed that participation was sheer voluntary, and could be terminated at any time without reason and without any penalty. An informed written consent was taken from the participants (aged >18 years) before interview, and they were ensured that all their personal information would be preserved with strict confidentiality. However, in the case of pregnant girls aged <18 years, the study procedure adopted the assent from participants and consent from their legal guardian (husband/father). While entering each household, we gather consent of participation from the household head as well. The study protocol was reviewed and approved by the FAHS-REC, DIU ethics committee.

Consent for Publication Not applicable

Competing Interests The authors declare no competing interests.

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