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# DETERMINANTS ASSOCIATED WITH DRUG ABUSE SEVERITY AMONG YOUNG DRUG USERS IN BENGALURU

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## **ABSTRACTS**

Plenty of studies have demonstrated family dysfunction and lack of religiosity as determinants of drug abuse. However, this fact does not guarantee that the factors would continue to be determinants of worsening the condition of drug users. The present study, drawing on the adaptational theory of drug abuse, examined whether drug users' self-evaluative family dysfunction and religiosity predict both drug abuse and abuse severity. It also investigated possible determinants of abuse severity. Abuse severity, family dysfunction, and religiosity were assessed among 50 young drug users in the city of Bengaluru, India. Their brief demographic and drug-related information was collected. For the control group composed of 68 young people who were not in drug use, family dysfunction and religiosity were measured. The results indicated that family dysfunction and lack of religiosity were not correlated with abuse severity though they tended to predict drug abuse. The duration of drug use appeared as a salient predictor of abuse severity. Early-onset of drug use and frequent arrest experiences were significantly correlated with abuse severity, yet they did not predict high severity. However, the study found the possibility that the two factors indirectly influence severe conditions by leading to long-lasting drug abuse. The

implications of the study were discussed in terms of drug policy and intervention.

Keywords: Drug abuse, abuse severity, risk factor, family dysfunction, religiosity.

## **INTRODUCTION**

An epidemic of drug abuse threatens not only public health but also social stability due to the negative consequences. It is astounding to see today's unprecedented high record in drug production (United Nations Office on Drugs and Crime, 2018). A latest national survey of India, conducted among general population ranged from 10 to 75 years old by household visit, reported a radical spread of opioid use throughout India. The prevalence of drug use among Indian males (3.97%) has increased over five times than 14 years ago; the measure was noticeably worse than the global level (0.70%) (Ambekar et al., 2019). India is in an urgent need of effective drug prevention.

Drug prevention strategies require accurate understandings of the impacts of psychosocial risk factors on drug users to reduce the unnecessary efforts and find customized protective factors (Hawkins et al., 1992). Besides peer influence, there has been enough research that supports family functioning and religiosity as both

risk and protective factors in drug abuse. Scholars have investigated the two factors in terms of drug initiation, prevalence, and relapse. However, it has been rare to examine whether or how much drug users' perceptions of the two factors influence abuse severity in their continued drug use. We may hastily assume that drug users with higher risk factors would be more likely to be in severe conditions. However, that might not happen in their subjective views because of the adaptive effects that drug use provides.

Drawing on the adaptational (or psychosocial) theory of drug abuse (Hendin, 1980; Hendin & Hass, 1985), the present study assumed that influence of psychosocial risk factors to drug abuse would change as time goes beyond drug initiation stage. It also postulated that long-term drug use is one of the contributory factors to abuse severity. This study questioned if young drug users' perceptions of their family functioning and religiosity are significantly associated with their continuous deterioration in drug abuse. First, for this, it compared self-evaluative family dysfunction and religiosity between young drug users and non-drug-using youths. And then it investigated the associations of the two factors and abuse severity. Second, the study explored possible determinants of abuse severity among demographic and drug-related variables, mainly focused on the duration of drug use, drug initiation age, and arrest experiences.

## **REVIEW & THEORETICAL BACKGROUND**

### **Family functioning and drug abuse**

Drug abuse is interrelated with functional aspects of the family (Gruber & Taylor, 2008). Family functioning signifies the functional performance of structural and relational roles and actions that occur within the family as a system.

Over the last several decades, research has accumulated empirical evidence on the close relationship between family functioning and drug abuse. Children who grew up under poor parenting such as improper care, lack of monitoring, and parental disengagement were more likely to abuse drugs later (Bahr et al., 1998; Ewing et al., 2015; Nurco & Lerner, 1996). Studies also observed a lack of family bonds and poor attachment among young drug users (Hoffman, 1993; Nurco & Lerner, 1996). Sometimes, traumatic familial experiences like divorce, domestic violence, and emotional and sexual abuse were reported to play a role in bringing drugs into families (Edwards et al., 2017; Gutierrez et al., 1994; Hoffmann, 1993). Indian studies also observed a similar pattern in the relationship between family factors and drug abuse. Broken family, familial conflicts, physical and sexual exploitation, parental substance abuse, and familial history of crimes were frequently found among Indian children and adolescents with drug abuse (Benegal et al., 1998; Dhawan et al., 2016; Gupta et al., 2013; Sharma et al., 2015). Therefore, based on prior evidence, the study hypothesized that drug-using youths would be significantly higher in family dysfunction than non-drug-using youths (Hypothesis 1).

### **Religiosity and drug abuse**

Religiosity refers to adherence to religious values and practices. There have been numerous studies reporting a negative relationship between religiosity and drug abuse for more than last four decades (Amoateng & Bahr, 1986; Dew et al., 2008; Gorsuch & Butler, 1976; Yonker et al., 2012). The majority of literature is from North American studies. Studies demonstrated that low religiosity was an evident predictor of substance use regardless of age, sex, drug types, number of supportive friends, and degree of mental distress (Bahr et al., 1998; Edlund et al.,

2010; Miller et al., 2000). Other studies have examined the delicate relationships of religiosity to drug abuse by distinguishing the internal importance of religion from external religious behavior. A study found that the importance of religion was a predictor of drug abuse (Lorch & Hughes, 1985). Chu (2007) also demonstrated a similar prediction of drug initiation by internal religious salience, yet drug cessation was not predicted by the importance of religion but by devotional behavior. Another study observed that adolescents who were in more agreement with Christian commitment statements had less likelihood of drug use (Hope & Cook, 2001). Regular attendance at church services was observed to associate with the reduction of drug use in both clinical and non-clinical adolescents (Pullen et al., 1999; Richard et al., 2000). Religious abstinence might be one of the persuasive reasons why religiosity is negatively related to drug abuse in Western contexts, especially in North America. Empirical studies reported that individuals from abstinent, anti-drug, and conservative religious denominations tended to show less involvement in drug abuse (Amoateng & Bahr, 1986; Miller et al., 2000). Reviewing literature, Gorsuch (1995) pointed out that pro-drug religious cults or restrictive religions might not have desirable effects as protective environments.

During the last decade, scholars in countries outside North America have paid attention to religiosity regarding drug abuse. Brazilian studies showed similarity with the findings in North American literature. Young people with higher religiosity or in more religious involvement appeared to have less likelihood of drug use (Rezende-Pinto et al., 2018; Van der Meer Sanchez et al., 2008). A study in Iran, a non-Western country in which the majority is Muslims, also found that college students with higher religiosity were less likely to use

drugs (Mohammadpoorasl et al., 2014). Indian academics have rarely explored the empirical relationship between religiosity and drug abuse. However, based on the prior literature, the study also assumed that drug-using youths would be significantly lower in religiosity than non-drug-using youths (Hypothesis 2). According to the latest Indian Religion census, India has almost 99.8 percent of the religious population; the majority are Hindus (79.8%) followed by Muslims (14.23%), and Christians (2.30%) (Census 2011, 2015). Unlike Western countries rooted in Christian individualism, religious communalism has been a prominent characteristic in overall societies of India (Chandra, 2008). Traditionally, cannabis has been for religious and medicinal purposes in India (Russo, 2006; Touw, 1981). Some states in India have recently legalized the use of bhang (a less intoxicating and edible type of cannabis).

### **Psychosocial risk factors and adaptation**

As a theoretical basis, the research draws on an adaptational theory of drug abuse (Hendin, 1980; Hendin & Hass, 1985). Hendin (1980) extended the scope of analysis from psychodynamics through psychosocial dynamics. He viewed an individual's drug use as an adaptational attempt to social relationships and environments. From his point of view, drugs furnish drug users with a sense of relief from the pressure of their psychosocial problems. Though drugs are often for recreational purpose, they also play a role like a mitigative from violent impulses or depressive emotions (Hendin & Haas, 1985). Hendin (1973) found that college students tended to use drugs to help their academic achievement or reduce competitive pressures. Hendin and Hass (1985) observed young marijuana users in the context of family dynamics and finally summarized their pattern as "troubled adaptation" (p. 114). That refers to drug users' tendencies to adapt themselves to

their troubled situations with the help of drugs even while they become chronic and face ongoing self-destructiveness. Young drug users may face conflicts between adaptational effects of drug use and the adverse consequences. However, as they gradually depend on drugs, they may put more stress on the adaptive function of drug use rather than being attentive to the harms caused by their drug use. This troubled adaptation may lead to the possibility that drug users change their perceptions and interpretation of their psychosocial environments while they continue to use drugs. For example, as they get accustomed to drugs and drug subculture, they can think other issues lightly or differently. Therefore, the present study premised that troubled adaptation, as one of psychosocial dynamics of drug abuse, would occur in drug users' perceptions of psychosocial risk factors.

#### **Family functioning, religiosity, and abuse severity**

The study questioned whether drug users who perceive higher family dysfunction or lower religiosity would be likely to be more serious in their abuse condition. From the adaptive view, the study assumed that their perceptions of the risk factors might not be determinants of the continuous deterioration of drug users' conditions. Therefore, the study hypothesized that drug users' self-evaluative family dysfunction and religiosity would not be significantly associated with their abuse severity (Hypothesis 3). Conceptually, a risk factor to drug abuse does not necessarily mean that it would also worsen the condition of drug abuse. For instance, suppose a lack of parental monitoring was found as a strong risk factor to a teenager's initiation of drug use. This, however, does not imply that the risk factor had increased the adolescent's drug dependence. The relationships between a risk factor of drug abuse and

abuse severity should be distinct from the one between the risk factor and the prevalence (or likelihood) of drug abuse. Gorsuch (1995) classified substance abuse into three steps: initial use, continued use, and dependence. He argued that the goal of drug prevention should be differentiated according to the stages because drug users' perceptions and controllability over drug dependence vary by the stage. Drug abuse severity is a crucial consideration when a drug user is engaged in the stages of continued use and dependence after their initial stage.

Furthermore, it is necessary to examine drug users' abuse severity in consideration of the psychosocial dynamics of drug abuse. There was a study that predicted the results without considering the psychosocial dynamics in drug users and their family members. Noone (1983) empirically investigated the associations between family functioning and abuse severity. He divided sixty drug abuser's families, who participated in an outpatient program, into two groups according to abuse severity (mild: 30 families, severe: 30 families). Both family members and drug abusers assessed their own family cohesion and adaptability. The researcher hypothesized that family functioning would be more dysfunctional in the severe group than the mild group. However, unlike his expectation, the research ended up with the result that family cohesion and adaptability were not in satisfactory associations with abuse severity. The study expected to replicate similar findings in the subjective perceptions of young drug users. With its focus on religion, the researcher could find a glimpse of different associations between religiosity and drug abuse according to individuals' facing contexts. For example, a study of Chu (2007) demonstrated that the importance of religion was a significant predictor of the initiation of drug use. However, the intrapersonal religiosity was not significantly associated



with cessation from drugs among those already in their continued use. Drabble et al. (2016) compared religiosity and lifetime substance abuse between heterosexual and non-heterosexual women. Religiosity was a predictor of substance abuse among the heterosexual females. However, religiosity was not a predictor among sexual minority females who included notably more long-term users than the heterosexual. All these findings support that the two risk factors of drug abuse may not be determinants of abuse severity due to drug users' adaptive psychosocial dynamics.

### **Determinants of abuse severity**

The severity of drug abuse (including dependence and addiction) is a crucial indicator to help practitioners decide the degree of treatments and interventions for the clients. High severity in drug abuse may lead to negative emotions, risky behaviors, and premature deaths due to accidents or suicidal attempts (Chaudhury et al., 2010; Fernández-Serrano et al., 2010; Maynard et al., 2016; Simoneau et al., 2016). The biopsychosocial factors associated with the deterioration of drug abuse are crucial for the prevention of drug abuse and the related harms. First, substances have biochemical adverse effects in terms of abuse severity. Latest studies observed that hormones and cerebral functions were associated with the severity of substance addiction (Escobar et al., 2018; Moreno-López et al., 2012). Drug types can differently influence drug abuse severity according to the addictiveness and patterns. Meyer et al. (2015) examined the association between the history of heroin use and the seriousness of opioid abuse. They found that opioid users who had a more frequent history of heroin use were more severe in their abuse than those with less heroin use. Another study reported that patients in comorbid opiate and cocaine dependence were found to be highly addictive

compared to people in opiate dependence (Rodríguez-Cintas et al., 2016).

Second, scholars have found that abuse severity is connected to psychological or mental problems. A recent study demonstrated that more psychiatric symptoms predicted higher severity in drug addiction among methamphetamine-dependent individuals (Polcin et al., 2015). There are some specific mental disorders empirically proven to be associated with abuse severity. For example, clients who are in attention deficit hyperactivity disorder (ADHD) and conduct disorder are often reported to be more likely to be higher in addiction severity (Carpentier et al., 2010; Dunne et al., 2014; Torok et al., 2012; Yewers et al., 2005). Severe drug abuse often exposes individuals to sexual abuse and violence that cause psychological trauma or depression. A study observed that 29 percent of opioid-dependent participants diagnosed as post-traumatic stress disorder (PTSD) were significantly associated with high addiction severity (Clark et al., 2001). Another study conducted among Portuguese drug users reported that depression was strongly related to abuse severity, especially in females than males (Coelho et al., 2000).

Third, research on social determinants of abuse severity has been rare. Though migration was known to be a risk factor to drug abuse, a study observed that it had a non-significant relationship with severity (Carballo & Nerukar, 2001; Taïeb et al., 2012). There was some literature dealt with socio-demographic factors in consideration of drug abuse severity. A study of Coelho and his associates (2000) found significant associations between severity and some socio-demographic factors. Male, non-married, and unemployed participants appeared to be more severe in drug abuse than the others. However, in another study in Israel, female drug users were more severe than male users (Isralowitz et al., 2007).

Treatment is one of the crucial social elements in the reduction of the severity of drug abuse. Drug users who had ever exposed to clinics were significantly lower in abuse severity than those who never resorted to treatment (Coelho et al., 2000). Another study demonstrated that more accessibility and continuity to primary care predicted lower abuse severity (Kim et al., 2007).

### **Duration of drug use, early initiation, and arrest experiences**

The study explored three variables the duration of drug use (duration), drug initiation age (initiation), and the number of arrest experiences (arrests) as plausible determinants of abuse severity. Most of all, the study paid attention to the duration of drug use as a more salient determinant of abuse severity than initiation age and arrests. It hypothesized that duration would positively predict abuse severity among participants in drug use (Hypothesis 4). Based on the adaptational theory (Hendin, 1980), the study defined the duration of drug use as a period of maintaining troubled adaptations to drug abuse. Drug users may gradually become insensitive to the negative consequences as the period gets longer. Prolonged drug abuse is found to increase drug-induced emotional disturbance and brain malfunctions (Fernández-Serrano et al., 2010; Moreno-López et al., 2012). A few studies partly dealt with the association between the duration of drug use and abuse severity. Coelho et al. (2000) reported that participants in a group with higher abuse severity were in a more prolonged period of drug use. Meyer et al. (2015) found that using opioid with heroin led to a more extended period of drug use than consuming opioid alone. Also, the group in more severe conditions of heroin abuse was significantly longer than the less severe group in the period.

Next, the study looked at the associations of the duration of drug use

with initiation age and arrest experiences in predicting abuse severity. In general, youngsters' longstanding drug use signifies relatively early drug initiation. Also, there might be more arrest experiences among long-term drug users. First, the study assumed that drug initiation age would be significantly associated with abuse severity (Hypothesis 5). From the adaptive view, Hendin (1980) argued that one's earlier drug initiation might lead to more significant impairment because the early-onset reflects adaptive vulnerabilities in their young ages. There is some evidence that the earlier history of drug use predicted more severe and earlier drug dependence in young adulthood (King & Chassin, 2007; Walters & Urban, 2014). Others observed that the early-onset of substance use was positively related to abuse severity among adult offenders (Gustavson et al., 2007; Tillson et al., 2018). Second, the researcher hypothesized that the frequency of arrest experiences would be significantly associated with abuse severity (Hypothesis 6). From the adaptive perspective, young drug users may gradually put more significance in continuing drug use while being dependent on drugs, in spite of the disadvantages of legal punishments. Coelho et al. (2000) found that those who went through crimes and detentions were assessed higher in abuse severity than those who have no experiences.

## METHODS

### Participants

Table 1 Socio-demographic characteristics of drug-using youths (DY) and non-drug-using youths (NY).

Socio-demographic variables	Frequency (%)		X <sup>2</sup>	p-value
	DY	NY		
Developmental stages			3.112	.078
Adolescence	38.0	54.4		
Early adulthood	62.0	45.6		
Education level			13.515	.004
Below 7 <sup>th</sup> Standard	16.0	1.5		
8 <sup>th</sup> to 12 <sup>th</sup> Standard	36.0	23.5		
Undergraduate/graduate	44.0	63.2		
Above postgraduate	4.0	11.8		
Religion			3.725	.293
Hinduism	60.0	58.8		
Islam	22.2	11.8		
Christianity	16.0	22.9		
Other	2.0	1.7		

Participants are 50 acting drug-using youths aged 17 to 27 years ( $M = 20.86$ ,  $SD = 2.59$ ) and 68 non-drug-using youths aged 17 to 28 years ( $M = 19.96$ ,  $SD = 2.36$ ) in the metropolitan areas of Bengaluru, India. All participants were males. Ages between two groups had similar distributions ( $t = 1.97$ ,  $p > .05$ ). Table 1 describes the socio-demographic characteristics of both groups. Participants in adolescence and early adulthood had similar distributions between the two groups. Religious distributions had a similarity; however, education level was different in the distributions.

### PROCEDURE

The researcher collected data from drug-using youths by a snowballing sampling, and then, carried out a quota sampling among non-drug-using youngsters to increase the socio-

demographical homogeneity between groups. A documented informed consent was obtained from each participant in respect of their autonomy, and the anonymity and confidentiality of information were ensured and maintained (National Committee for Ethics in Social Science Research in Health, 2004). Participants in both groups evaluated their own family dysfunction, religious commitment, and drug abuse severity and their demographic information (age, education level, religion, and income) was investigated. Drug-related information was collected from drug-using participants: duration of drug use, drug initiation age, number of drug-related arrests, number of other criminal arrests, and presence of drug user(s) in family. The survey for the drug-using group included youths who had been using at least one illegal drug along with other substances for more than one year.



## **INSTRUMENTS**

Family dysfunction was measured by the general functioning scale, a concise version of McMaster family assessment device (FAD), which is composed of six domains of family functioning: problem-solving, communication, roles, affective responsiveness, affective involvement, and behavior control (Epstein, Baldwin, & Bishop, 1983). The study used the general functioning scores without dealing with the specific dimension scores. Participants were asked to answer on 4-point Likert scales. Higher scores indicate more dysfunctional. The total score is the mean value of all 12 items.

The religious commitment inventory scale (RCI-10) assessed religiosity (Worthington et al., 2003). One of merits of the tool is its broad applicability to various religions. The scale is composed of two operational variables: interpersonal and intrapersonal commitment. Interpersonal commitment is the degree of engagement to religious relationships and practices. Intrapersonal commitment is defined by the degree of adhering to religious values and beliefs. The score of each dimension is the sum of the scores of the relevant items. A higher score indicates a greater commitment.

To assess drug abuse severity, Drug Abuse Screening Test (DAST)-10 was used (Skinner, 1982; Nicholson, Duncan, White, & Watkins, 2012). The scale was given to even non-drug-using participants to verify them once more. Individuals who had been in more than 12 months of drug use were asked to answer “yes” or “no” to each question about drug-related experiences. For example, “Do you abuse more than one drug at a time?” “Are you unable to stop abusing drugs when you want to?” The score is the counted number of “yes” in each question except for an item to add reversely. The range of score is 0 to 10.

## **DATA ANALYSIS**

IBM SPSS Statistics version 25 was used for data analysis. In the first section, family dysfunction and religiosity (interpersonal and intrapersonal) were compared between drug-using youths and non-drug-using youths. Pearson correlations were tested to analyze the primary relationships among variables. A Mann-Whitney U test compared family dysfunction between the groups because it did not satisfy the homogeneity of variance in two groups. Independent samples t-tests were employed to examine the differences in religiosity variables between the two groups. In the second section, Pearson correlations were used to investigate the associations of abuse severity with family dysfunction and religiosity and to find out correlated variables with abuse severity. A multiple linear regression was employed to predict abuse severity by three associated independent variables: duration of drug use, initiation age, and arrest experiences.

## **RESULTS**

### **Family dysfunction and religiosity**

A significant correlation was observed between family dysfunction and age among non-drug-using youths (NY) ( $r = -.263, p < 0.05$ ). The correlation was non-significant among drug-using youths (DY) ( $r = .189, p = 0.189$ ). Significant correlations between two religiosity variables were observed in both DY ( $r = .534, p < 0.01$ ) and NY ( $r = .662, p < 0.01$ ). A contrasting result was found between two groups; religiosity had a significantly negative correlation with education level among DY (interpersonal:  $r = -.557, p < 0.001$ , intrapersonal:  $r = -.400, p < 0.01$ ) whereas a non-significant correlation was found among NY (interpersonal:  $r = -.005, p = 0.971$ , intrapersonal:  $r = .132, p = 0.282$ ). Especially, a significant correlation between religiosity and

education level was observed among Hindu DY (interpersonal:  $r = -.663$ ,  $p < 0.001$ , intrapersonal:  $r = -.376$ ,  $p < 0.05$ ).

Table 2 Mean and standard deviation of psychosocial variables in drug-using youths (DY) and non-drug-using youths (NY).

Psychosocial variables	Mean $\pm$ Standard deviation		<i>p</i> -value
	DY (n=50)	NY (n=68)	
Family dysfunction	2.13 $\pm$ 0.39	1.98 $\pm$ 0.57	0.045 <sup>a**</sup>
Religiosity (interpersonal)	10.92 $\pm$ 4.04	11.31 $\pm$ 4.78	0.642 <sup>b</sup>
Religiosity (intrapersonal)	16.58 $\pm$ 4.80	18.00 $\pm$ 5.92	0.166 <sup>b</sup>

\*\*  $p < 0.05$  a Mann-Whitney test b Independent samples *t*-test

To test the first and second hypotheses, family dysfunction and religiosity (interpersonal, intrapersonal) were compared between NY and DY. Table 2 describes the mean value and standard deviation of three dependent variables in both groups. A Mann-Whitney test indicated that drug-using youths (Mdn = 2.04) were significantly dysfunctional than non-drug-using youths (Mdn = 1.88) in the family functioning,  $U = 1332.5$ ,  $p < .05$ ,  $r = 0.18$ . An independent samples *t*-test indicated that drug-using youths were non-significantly higher in both interpersonal and intrapersonal religiosity variables.

Table 3 describes the results in three religious groups (Hinduism, Islam, and Christianity). Participants were split by religion into three divisions. After assuring normal distributions and the homogeneity of variance in each religious group, an independent samples *t*-test compared religiosity variables between DY and NY. Hindu and Muslim samples did not show any significant differences between DY and NY. However, Christian participants' sample showed a considerable gap between DY and NY.

Drug-using Christian youths were significantly lower than non-using Christian youngsters in their interpersonal and intrapersonal religious commitment, especially more outstandingly in intrapersonal religiosity.

Next, another correlation test examined

Table 3 Mean and standard deviation of religiosity by religion in drug using youths (DY) and non-drug-using youths (NY).

Religion	Religiosity	Mean ± Standard deviation (n)		p-value
		DY	NY	
Hinduism (n = 70)	Interpersonal	10.77 ± 4.13 (30)	10.40 ± 4.87 (40)	0.741
	Intrapersonal	16.40 ± 4.51 (30)	16.03 ± 5.19 (40)	0.753
Islam (n = 29)	Interpersonal	12.09 ± 3.14 (11)	12.13 ± 5.57 (08)	0.987
	Intrapersonal	18.00 ± 4.49 (11)	19.00 ± 5.90 (08)	0.680
Christianity (n = 27)	Interpersonal	9.50 ± 4.87 (08)	12.95 ± 4.08 (19)	0.069*
	Intrapersonal	14.50 ± 5.83 (08)	22.16 ± 5.26 (19)	0.003***

N = 116 \*p < 0.1 \*\*\* p < 0.01

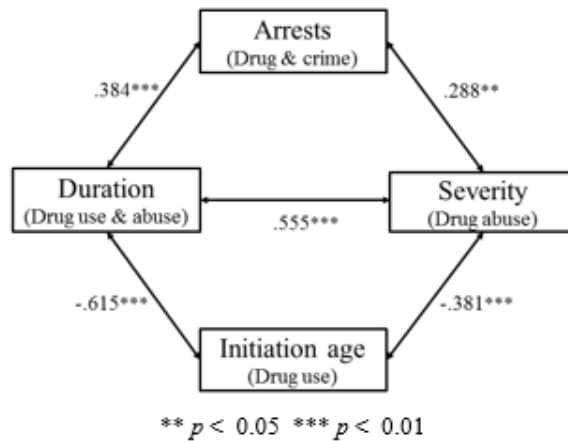
In sum, the results regarding family functioning demonstrated Hypothesis 1 by showing that DY's self-report family dysfunction was significantly higher than NY's. However, the findings in religiosity partially supported Hypothesis 2 only among Christian participants. DY were more likely to report that they are not religious compared to NY among Christian participants. However, Hindu and Muslim participants did not show any notable differences between DY and NY.

#### Determinants of drug abuse severity

To test the third hypothesis, correlations were analyzed among variables: family dysfunction, religiosity (interpersonal, intrapersonal), and abuse severity. As a result, both family dysfunction ( $r = -0.075$ ,  $p = 0.607$ ) and religiosity (interpersonal:  $r = 0.144$ ,  $p = 0.320$ , intrapersonal:  $r = 0.189$ ,  $p = 0.188$ ) were found to be non-significantly correlated with abuse severity. The findings supported Hypothesis 3 that the two psychosocial risk factors would not be associated with abuse severity. Family dysfunction and low religiosity were not significant determinants of abuse severity.

demographic and drug-related variables. Abuse severity was non-significantly correlated with age, religion, education level, income, presence of drug user(s) in family, and number of criminal arrests (all  $p > 0.05$ ). However, it had significant correlations with the duration of drug use ( $r = .555$ ,  $p < 0.001$ ), initiation age ( $r = -.384$ ,  $p < 0.01$ ), number of drug-related arrests ( $r = .297$ ,  $p < 0.05$ ), and total number of arrests ( $r = .288$ ,  $p < 0.05$ ). The duration of drug use was highly and significantly correlated with initiation age ( $r = -.615$ ,  $p < 0.001$ ). The result supports that those who initiated drug use earlier than others may have more likelihood of longer duration in drug use. Figure 1 portrays the relationships of the variables significantly correlated with abuse severity.

Figure 1 Variables significantly correlated with drug abuse severity.



A hierarchical multiple regression analysis was conducted to predict abuse severity based on the duration of drug use (duration), initiation age (initiation), and the number of arrests (arrests). Table 4 described the results of the hierarchical regression model. Duration of drug use appeared as a salient predictor. In Model 1, duration alone explained 30.8 % of abuse severity; duration increased 0.331 of an abuse severity score for a year. In Model 2, initiation age increased 0.3% more than the first model. As all three variables were included in Model 3, there was only an increase of 1.4 % in predicting abuse severity compared to Model 1 with maintaining still high prediction by the duration of drug use (44.2%). The result showed that the duration of drug use is the strongest predictor of abuse severity among the three variables.

Table 4 Hierarchical multiple regression models of predicting drug abuse severity based on duration of drug use, initiation age, and frequency of arrests.

Predictor	Model 1			Model 2			Model 3			VIF
	SE	$\beta$	t	SE	$\beta$	t	SE	$\beta$	t	
Duration	0.07	0.55	4.626*	0.09	0.513	3.345*	0.10	0.442	2.524*	2.07
Initiation age			**	0.09	-		0.10	-		1.77
Arrests				5	0.068	-0.445	0	0.111	-0.688	8
							0.14	0.119	0.859	1.29
							1	0.119	0.859	3
$R^2(\Delta R^2)$	0.308			0.311 (0.003)			0.322 (0.011)			
F	F(1, 48) = 21.398 ***			F(2, 47) = 10.619 ***			F(3, 46) = 7.286 ***			

\*\*  $p < 0.05$  \*\*\*  $p < 0.01$

Next, a multiple linear regression was calculated to predict the duration of drug use by initiation age and arrests. The multiple regression model indicated a strong and positive prediction of duration with an  $R^2$  of .519,  $F(2, 47) = 25.348$ ,  $p < 0.001$ . Initiation age and arrests explained 51.9 % of the duration of drug use. Both initiation age ( $\beta = -.612$ ,  $t = -6.045$ ,  $p < .001$ ) and arrests ( $\beta = .376$ ,  $t = 3.713$ ,  $p < .001$ ) predicted the duration of drug use.

Figure 2 Path diagram via regression in predicting abuse severity based on duration, arrests, and initiation age

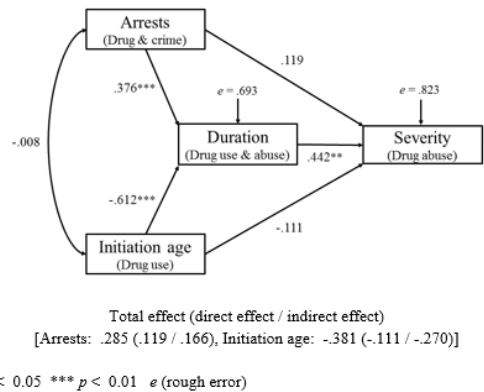


Figure 2 describes a path diagram which reduced the overall results of the regression models. The rough error variances ( $e$  values) were calculated as  $\sqrt{1-R^2}$ . The  $e$  value for duration was 0.693. The  $e$  value for abuse severity was 0.823. Arrests ( $\beta = .119$ ,  $p = .395$ ) and initiation age ( $\beta = -.111$ ,  $p = .495$ ) did not directly predict abuse severity. However, both variables significantly predicted duration. In the path diagram, the rough estimates of indirect effects of the two variables through duration were respectively .166 and -.270. In the estimated total effects, arrests explained 28.5% of abuse severity and initiation age explained 38.1% of abuse severity.

In sum, this section verified Hypothesis 4 by indicating that longer duration of drug use predicted higher abuse severity. It also verified Hypothesis 5 and 6 by showing significant correlations between the other two variables (initiation age and arrests) and abuse severity. However, they were not found as predictors of the duration of drug use. Instead, they had indirect effects in predicting abuse severity by way of the duration of drug use.

## **DISCUSSION**

### **Risk factors in drug abuse vs. determinants of abuse severity**

As reviewed in the prior empirical literature, family dysfunction and low religiosity have been remarkable psychosocial risk factors for drug abuse. The study replicated the previous evidence by demonstrating that family dysfunction was a notable risk factor for drug abuse. The family dysfunction level reported by drug-using youths (DY) was significantly higher than the level of non-drug-using youths (NY). However, when it comes to religiosity, there were different results by religion. Low religiosity appeared as a predictor of drug abuse by demonstrating a significant difference between Christian DY and NY participants. The result is in

line with most of the prior research conducted under the background of Western Christianity. However, Hindu and Muslim participants did not show any significant differences between DY and NY. It became challenging to regard that low religiosity would be a risk factor for drug abuse among young Hindu and Muslim drug users. There should be further studies to clarify what made such differences in the outcomes according to religion. However, at least the results imply that religiosity may have different influences on drug abuse according to religious values and cultural practices. As reviewed, most of the North American literature that reported a negative relationship between religiosity and substance abuse was in the contexts of Christianity and similar denominations. Abstinence from substances was an outstanding emphasis on their religious principles and exercises (Amoateng & Bahr, 1986; Levy, Campbell, Shea, & DuPont, 2018; Miller et al., 2000). In contrast, Indian Hindu and Muslim cultures seem to have been traditionally and relatively tolerant in substance use compared to Western religions.

Another significant finding of the study was that young drug users' perceptions of their family dysfunction and religiosity were not significantly associated with their abuse severity. Family dysfunction was not a significant determinant of abuse severity among DY, even though DY's family dysfunction was significantly higher than NY's. The evidence replicated the empirical findings of Noone (1983) in terms of the dissociation between abuse severity and family functioning. Abuse severity was also found to be non-significantly related to religiosity among all Hindu, Muslim, and Christian DY. The results support that psychosocial risk factors to drug abuse are not necessarily the determinants of abuse severity. They also imply the possibility that adaptive psychosocial dynamics cause changes in



the perceptions of young drug users in spite of the negative consequences of drug use.

### **Duration of drug use and abuse severity**

First, the study demonstrated that the duration of drug use was a salient predictor of drug abuse severity among youths in continued drug use. The result corresponds to the prior evidence about the negative influence of prolonged drug uses in the conditions of drug users (Coelho et al., 2000; Fernández-Serrano et al., 2010; Meyer et al., 2015; Moreno-López et al., 2012). Next, early drug initiation and arrests appeared as notably associated with the protracted drug use among young drug users. Though drug initiation age and arrests did not predict abuse severity, it was plausible for them to have indirect effects on abuse severity by way of the prolonged period of drug use (Figure 2).

The overall findings suggest that long-term drug use play a significant role in the deterioration of young drug users' conditions while interacting with other drug-related maladaptive factors. As the study demonstrated, the earlier drug initiation in itself may not explain higher abuse severity. However, the negative impact of early-onset can lead to more unstable conditions over time through the dysfunctional adaptations toward drug abuse. This point can explicate the prior evidence on why an individual who had an earlier onset of drug use appeared to be more chronic conditions in adulthood (Gustavson et al., 2007). More precisely, drug users who had earlier initiation of drugs are likely to be in a more extended period of drug use, and the lengthened duration may work as the main cause of increasing abuse severity. In sum, the overall results suggest that long-term drug use is a core predictor of severe drug abuse. Also, the prolonged period of drug use provides the space where other risk

factors may indirectly increase abuse severity.

### **SUGGESTIONS**

The overall findings of the study lead to suggestions regarding drug prevention and intervention policy among young drug users. Firstly, the observed dissociation between the two psychosocial risk factors and abuse severity suggest that there should be customized interventions in consideration of their dysfunctional adaptations. Practitioners in the treatment and prevention of drug abuse used to keep paying attention to psychosocial risk factors in and around individuals with drug abuse. Upon this, the study suggests taking their maladaptive dynamics into practitioners' considerations. It is because psychosocial risk factors to drug abuse may not be significantly associated with continuous deterioration of drug users' conditions. Today's prevention science for adolescent drug abuse looks more targeted on teens who are susceptible to drug use or in their initial use stage. The applications are mainly about reducing psychosocial risk factors while strengthening protective factors. However, it is another demand to develop proper prevention strategies for late adolescents or young adults who are already in their continued and dependent drug abuse (Robertson, David, & Rao, 2003). Therefore, the study urges efforts to bring more authentic evidence of dysfunctional adaptations of drug abuse among young drug users placed in continued drug use. Sophisticating knowledge of the ongoing psychosocial dynamics about risk factors is necessary for more systematic approaches (Csiernik, 2002; Gruber & Taylor, 2008). The attempts are expected to help effective prevention strategies and also serve to contrive plans reflecting the maladaptive dynamics into the consideration of treatment and intervention.

Secondly, the highlighted importance of the duration of drug use as a core determinant of abuse severity among young drug users suggests a need of flexible connectivity among strategies in drug policy toward prompt and early intervention in continued drug abuse. Prior empirical literature and the study have indicated the significant associations among duration, early drug onset, criminal involvement, and abuse severity. Prolonged drug use was a decisive predictor of abuse severity among young people who are already in regular drug use after initiation stage. The study suggests that drug policy should take a look at ways to shorten the duration of their continued drug use as early as possible. For decades, the Indian government has maintained a trifold strategy in drug policy to reduce drug supply, demand, and the harm caused by injecting drug use (Tandon & Collective, 2015). Legal sanctions and criminalization regulate drug supply and demand. Indispensable contributors to drug demand reduction are treatment and rehabilitation interventions. However, those seeking therapeutic help are extremely rare among individuals in problem drug use. Only about 12 percent of all drug-dependent people were estimated to have experienced hospitalization or other treatments (Ambekar et al., 2019). Harm reduction strategies have approached injecting drug users (IDUs) through targeted interventions under the National AIDS Control Program (NACP). The aim was mainly to prevent the transmission of Human immunodeficiency virus (HIV). Harm reduction programs may not be sufficient for drug prevention due to the pragmatic focus on the prevention of imminent hazards rather than abstinence from drugs (Hathaway, 2001). The approaches require continuous efforts to complement the shortcomings lest they catalyze long-lasting drug abuse. On the other hand, the approaches can be a

channel to reach acting drug users and surface them out of their unexposed and continued drug abuse. Compared to punitive legal strategies, harm reduction strategies maintain more receptive attitudes toward working drug users. They can take advantage of the openness to prevent their continued drug abuse. Specifically, the study suggests that harm reduction policies in India are in an urgent need of extending the scope of service among children and adolescents below 18 years (Dhawan, Pattanayak, Chopra, Tikoo, & Kumar, 2016). However, the extension of harm reduction strategies to the younger age group will be more active in the condition of securing flexible connectivity with customized therapeutic interventions and drug prevention strategies.

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