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Risk Factors of Drug Abuse among Malay Males FELDA Settlers in Jerantut, Malaysia

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Keywords

• Drug abuse; Risk factor; Malay male; FELDA; Jerantut

Abstract

Introduction: Drug abuse places a heavy burden on public health systems in terms of treatment, care, prevention and their health consequences.The objective of this study was to determine risk factors associated with drug abuse among Malay males FELDA settlers in Jerantut, Pahang.

Methods: A population based unmatched case control study was conducted in FELDA settlements in Jerantut, Pahang. Cases were defined as confirmed male drug abuser aged 18 to 60 years old. Controls defined as those who had never used any drugs in their lifetime. A total of 180 cases were selected randomly from NADA list, 180 controls were selected randomly from FELDA name list. A self-administered questionnaire was used in this study. Multiple logistic regression analysis was performed using SPSS 22.0. The final model was adjusted for age groups, marital status, education level, employment status, monthly income, smoking status, alcohol consumption, peer influence, self-esteem, family structures, family involvement in drug abuse and religiosity scale.

Results: The response rate for case is 180 (89.1%) and 180 (90.0%) for the controls. The final model has a good fit. The highest risk of drug abuse was in age group 20 to 29 years compared to age group 40 to 49 years (aOR=6.93, 95% CI=1.61, 29.83). Those who completed only until primary school had more risk of drug abuse compared to those in tertiary level of education (aOR=11.36, 95% CI=1.78, 72.55). Cigarette smoking had higher risk of drug abuse compared to non-smoker (aOR=10.56, 95% CI=3.14, 35.56). A person who had consumed alcohol had higher risk of drug abuse compared to those who had never consumed alcohol (aOR=9.14, 95% CI=3.75, 22.27). Low self-esteem increases risk of drug abuse compared to normal self-esteem individual (aOR=7.34, 95% CI=3.66, 14.72). High resistance to peer influence was a protective factor for drug abuse (aOR=0.31, 95% CI=0.16, 0.62). Individuals with family members involved in drug abuse had higher risk of being a drug abuse compared to those who had none drug abuse in the family (aOR=4.28, 95% CI=1.80, 10.17).

Conclusion: The risk factors associated with drug abuse are lower education level, smoking, alcohol consumption, low self-esteem, young age, and having family members' involvement in drug abuse. High resistance to peer influence was a protective factor for drug abuse.

INTRODUCTION

World Health Organization (WHO) defined substance abuse as harmful or hazardous use of psychoactive substances, including alcohol and illicit drugs that can lead to dependence syndrome [1]. Globally, it was estimated that a total of 246 million people aged between 15 and 64 years, had ever used illicit drugs in 2013 [2]. From the most recent information from Malaysian's National Anti-drugs Agency (NADA), almost 30,844 cases were registered in year 2016, which demonstrated an increasing trend from the year 2015 and 2014 which reported 26,668 and 21,777 cases, respectively [3]. In Malaysia, the most common drugs of abuse were Opiates (53.5%), Methamphetamine (31.8%), Amphetamine-type stimulants (10.7%) and 'ganja' (3.9%) [3]. Drug abuse is one of the major social problems in Federal Land Development Authority (FELDA) settlements. It had been reported through mass media but, information gathered regarding this issue through scientific researchers was limited. FELDA is a Malaysian government agency, established in 1956 for the development of land and relocation with the objective of poverty eradication through cultivation of oil palm and rubber.[4]The largest FELDA settlements in Malaysia are in Pahang. Jerantut is the largest district in Pahang consists of 10 FELDA settlements under its administrative area [4]. Jerantut had the highest prevalence of registered drug abuser (0.23%) compared to other areas in Pahang [3]. Majority of drug abuser (96.2%) were male and local NADA Jerantut data for 2016 shows that the total number of registered drug abuser is 910 people in which 640 people (70.3%) are from FELDA settlements. Drug-related unemployment, absenteeism and injury will lead to incapacitation and imprisonment which serve to reduction in productivity [5].

Some important risk factors associated with drug abuse were smoking, ethnicity, age, education level, alcohol consumption and religiosity [6]. Apart from socioeconomic and security threats to the community, drug abuse poses major risk in spreading blood borne viruses such as HIV, Hepatitis B, and Hepatitis C [7]. Hence, this study was done to determine the risk factors of drug abuse among Malay male FELDA settlers in Jerantut, Pahang.

MATERIAL AND METHODS

A population-based unmatched case control study design was used to determine risk factors of drug abuse. This study was conducted in FELDA settlements area in Jerantut, Pahang. There are 10 FELDA settlements under administrative of Jerantut which consist of FELDA Jengka 8-9, Padang Piol, Sungai Retang, Sungai Tekam, Sungai Tekam Utara and Kota Gelanggi 1-4.Since most drug abuse in Malaysia involved males and most of FELDA resident were Malay, this study only include Malay males. Cases (n=180) were defined as confirmed Malaysian drug abuser registered with NADA. Controls (n=180) were defined as Malaysian citizens that never abuse any drugs in their lifetime and not registered with NADA. Both cases and controls reside in FELDA settlement areas in Jerantut, Pahang. Proportionate stratified random sampling technique was used in this study. For the case group, name lists of drug abuser were obtained from NADA. The list names that fulfill the inclusion and exclusion criteria were divided into 10 strata based on FELDA residency from the address registered in NADA registry. Samples were taken from each stratum by systematic sampling technique. For the control group, name lists were obtained from FELDA settlement's office according to FELDA residency. The list name that fulfill the inclusion and exclusion criteria were double-checked with NADA list names and strengthened by verbally asking them whether they had ever used drugs or not. If the names were found to be in NADA registry or they had ever used drugs, they were excluded in the control's list name. Systematic sampling technique was used to select sample randomly consistent with number of samples in case group.

Data collection

Written consent was taken from respondents who were interested to participate in this study. Cases were approached individually or in groups during rehabilitation session programs with NADA. For the control group, they were approached individually from house to house or in groups during local FELDA programs such as local meetings or activities. Upon receiving consent, self-administered questionnaire methods were applied. Respondents need to answer all the questions in all sections in 15 minutes. After that, the questionnaires were collected and double-checked once it has been completed.

Statistical analysis

The data was analysed using SPSS 22.0 for Windows. Continuous variables were summarized using means and 95% confidence interval (95% CI) and differences between two means weretested using t-test (normal distribution).For categorical variables, any differences between proportion of cases and controls were tested using Chi-square test. Fisher's exact test was used if more than 20% of cells had an expected value less than 5. Odds ratios (OR) with their 95% CI were used to measure the associations between drug abuse and risk factors. From the univariate analysis, we looked at the crude associations of drug abuse and the following risk factors: age groups, marital status, education level, employment status, monthly income, smoking status, alcohol consumption, peer influence, self-esteem, family structures, family involvement in drug abuse and religiosity scale. Multiple logistic regression analysis was used to determine the predictors of drug abuse. All the variables were analysed using 'Enter' method, 'Forward LR' method and 'Backward LR' method. 'Enter' method produced the maximum significant variables. Using combination of the independent variables, 68.0% of the variances in outcome were explained by the logistic model (Nagelkerke R square: 0.680). Hosmer and Lemes how goodness of fit test was not significant (p = 0.276) indicated that the model fits the data.All statistical tests were two-sided and a p-value of less than 0.05 was considered as statistically significant.

RESULTS

Characteristics of respondents

Table 1 showed the characteristics of respondents by age groups, marital status, education level, employment status, monthly income, smoking status, alcohol consumption, peer influence, self-esteem, family structures, family involvement in drug abuse and religiosity scale. The mean age for the drug abusers seems to be easier to understand than cases was 29.9 (95% CI = 29.2, 30.7) years with a median of 29.5 years and ranged from 20 to 43 years. The mean age for the as before controls was 32.4 (95% CI = 31.5, 33.3) years with a median of 32.0 years and ranged from 20 to 47 years. The differences between the mean age of the cases and controls were statistically significant ($p < 0.05$). Majority of the cases (53.3%) were single while majority of the control were married (57.2%). Comparing education level, 41.7% of the controls group completed tertiary education while only 19.4% of the cases completed tertiary education. Employment status for both cases and controls were nearly similar. Majority of the respondents were self-employed and nearly 10% of them were unemployed. Averages monthly income for both cases and controls group also were nearly similar. Majority of the respondents (43%) earn RM 1,001 - RM 3,000 per month. With regards to smoking status, 96.7% of the cases were smokers compared to 68.3% from the controls group. 45.6% of the cases had ever consumed alcohol compared to only 6.1% in control group. Majority of the respondents (71.7%) had high resistance to peer influence while in cases group; majority of them (55.0%) had low resistance to peer influence. There was a statistical significant association between self-esteem for cases and controls. Majority of both cases and controls lived with their nuclear family but in cases group, 58.9% live with nuclear family compared to 81.1% in controls group. Divorcees of parents were found in 24.4% of the cases compared to only 7.8% in control groups. 35.6% of the cases group had their family members involved in drug abuse. Majority of both cases and controls do strongly agree that religion is important in life.

Crude associations between drug abuse and independent variables

Table 2 shows the crude association between drug abuse and the independent variables. The highest odds of drug abuse faced by those in age group 20-29 years and it decreased after age of 30 years (OR=5.02, 95% CI=2.12, 11.9). With regards to marital status, the odds of drug abuse in divorced group was 8 times more compared to married group (OR=8.32, 95% CI=3.56, 19.42). Being a single increases risk of drug abuse 3 times compared to being married (OR=3.32, 95% CI=2.08, 5.31). Those with primary education had the highest risk of drug abuse (OR=8.57,

Table 1: Characteristics of cases and controls.

Characteristics	Cases (%) (*n*=180)	Control (%) (*n*=180)	χ^2 test	P-value
Age Groups (years)			18.27	< 0.001*
20 to 29	90 (50.0%)	56 (31.1%)		
30 to 39	82 (45.6%)	99 (55.0%)		
40 to 49	8 (4.4%)	25 (13.9%)		
Marital Status			41.25	< 0.001*
Married	48 (26.7%)	103 (57.2%)		
Single	96 (53.3%)	62 (34.4%)		
Divorced	31 (17.2%)	8 (4.4%)		
Widower	5 (2.8%)	7 (3.9%)		
Education Level			25.15	< 0.001*
Primary	16 (8.9%)	4 (2.2%)		
Secondary	129 (71.7%)	101 (56.1%)		
Tertiary	35 (19.4%)	75 (41.7%)		
Employment Status			0.59	0.745
Employed	68 (37.8%)	75 (41.7%)		
Self-employed	92 (51.1%)	87 (48.3%)		
Unemployed	20 (11.1%)	18 (10.0%)		
Monthly income			2.61	0.625
No income	20 (11.1%)	18 (10.0%)		
Less than RM 1,000	66 (36.7%)	58 (32.2%)		
RM 1,001 - RM 3,000	78 (43.3%)	79 (43.9)		
RM 3,001 - RM 5,000	10 (5.6%)	16 (8.9%)		
More than RM 5,000	6 (3.3%)	9 (5.0%)		
Smoking Status			50.04	< 0.001*
Yes	174 (96.7%)	123 (68.3%)		
No	6 (3.3%)	57 (31.7%)		
Ever consumed alcohol			73.08	< 0.001*
Yes	82 (45.6%)	11 (6.1%)		
No	98 (54.4%)	169 (93.9%)		
Resistance to Peer Influence			26.33	< 0.001*
Low	99 (55.0%)	51 (28.3%)		
High	81 (45.0%)	129 (71.7%)		
Self-esteem			92.01	< 0.001*
Low	135 (75.0%)	44 (24.4%)		
Normal	45 (25.0%)	136 (75.6%)		
Type of family structure			30.32	< 0.001*
Nuclear Family	106 (58.9%)	146 (81.1%)		
Both biological parents without siblings	8 (4.4%)	7 (3.9%)		
Single-parents	29 (16.1%)	9 (5%)		
Grand-parents	12 (6.7%)	13 (7.2%)		
Blended Family	25 (13.9%)	5 (2.8%)		
Changes in family structures				
Divorcee of parents	44 (24.4%)	14 (7.8%)		
Death of parents	18 (10.0%)	7 (3.9%)		
No changes	118 (65.6%)	159 (88.3%)		

Family members involved in drug abuse			26.43	< 0.001*
Yes	64 (35.6%)	23 (12.8%)		
No	116 (64.4%)	157 (87.2%)		
Religion Importance			25.48	< 0.001*
Strongly Agree	156 (86.7%)	162 (90.0%)		
Agree	16 (8.9%)	15 (8.3%)		
Uncertain	8 (4.4%)	3 (1.7%)	2.42	0.298
Note: (*) significant at p <0.05				

Table 2: Crude association between drug abuse and age groups, marital status, education level, employment status, monthly income, smoking status, alcohol consumption, peer influence, self-esteem, family structures, family involvement in drug abuse and religiosity scale.

Determinants	Crude odds ratio (95% CI)	p-value
Age Groups (years)		
20 to 29	5.02 (2.12, 11.91)	<0.001*
30 to 39	2.59 (1.11, 6.05)	0.028*
40 to 49	1	
Marital Status		
Single	3.32 (2.08, 5.31)	< 0.001*
Divorced	8.32 (3.56, 19.42)	< 0.001*
Widower	1.53 (0.46, 5.08)	0.485
Married	1	
Education Level		
Primary	8.57 (2.67, 27.53)	< 0.001*
Secondary	2.74 (1.70, 4.42)	< 0.001*
Tertiary	1	
Employment Status		
Self-employed	1.17 (0.75, 1.81)	0.493
Unemployed	1.23 (0.60, 2.51)	0.578
Employed	1	
Monthly income		
No income	1.67 (0.50, 5.61)	0.409
Less than RM 1,000	1.71 (0.57, 5.09)	0.337
RM 1,001 - RM 3,000	1.48 (0.50, 4.36)	0.476
RM 3,001 - RM 5,000	0.94 (0.26, 3.44)	0.923
More than RM 5,000	1	
Smoking Status		
Yes	13.44 (5.62, 32.15)	< 0.001*
No	1	
Ever consumed alcohol		
Yes	12.86 (6.54, 25.29)	< 0.001*
No	1	
Resistance to Peer Influence		
Low	0.33 (0.21, 0.50)	< 0.001*
High	1	
Self-esteem		
Low	9.27 (5.74, 14.97)	< 0.001*
Normal	1	
Type of family structure		
Both biological parents without siblings	1.57 (0.55, 4.48)	0.395
Single-parents	4.44 (2.02, 9.77)	< 0.001*
Grand-parents	1.27 (0.56, 2.90)	0.568
Blended Family	6.89 (2.55, 18.58)	< 0.001*
Nuclear Family	1	
Changes in family structures		
Divorcee of parents	4.24 (2.22, 8.09)	< 0.001*
Death of parents	3.47 (1.40, 8.56)	0.007*
No changes	1	
Family members involved in drug abuse		
Yes	3.77 (2.21, 6.42)	< 0.001*
No	1	
Religion Importance		
Uncertain	2.77 (0.72, 10.63)	0.138
Agree	1.11 (0.53, 2.32)	0.786
Strongly Agree	1	
Note : (*) significant at p <0.05		

95% CI=2.67, 27.53) compared to those with tertiary education. The odds of drug abuse in secondary education were nearly 3 times more compared to tertiary education (OR=2.74, 95% CI=1.70, 4.42). Smoking increases odds of drug abuse 13 times more compared to non-smoker (OR=13.44, 95% CI=5.62, 32.15). Alcohol consumption was also increased odds of drug abuse by nearly 13 times compared to those who do not consume alcohol (OR=12.86, 95% CI=6.54, 25.29). There were no differences in the odds of drug abuse with regards to employment status and monthly income. High resistance to peer influence was a significant protective factor for drug abuse (OR=0.33, 95% CI=0.21, 0.50). Low self-esteem increased the odds of drug abuse by 9 times compared to normal self-esteem people (OR=9.27, 95% CI=5.74, 14.97). Those living in blended family (step parents or divorced parents) had the highest risk of being a drug abuse (OR=6.89, 95% CI=2.55, 18.58). The odds of drug abuse among

those living with single parents were 4 times compared to those living in nuclear family (OR=4.44, 95% CI=2.02, 9.77). Divorcee of parents increased 4 times odds of being drug abuse compared to no changes in family structures (OR=4.24, 95% CI=2.22, 8.09). Meanwhile, death of parents increases 3 times odds of being drug abuse compared to no changes in family structures (OR=3.47, 95% CI=1.40, 8.56). Having family members that involved in drug abuse also increases odds of drug abuse by nearly 4 times compared to those who do not have family members involved in drugs (OR=3.77, 95% CI=2.21, 6.42). There were no significant differences in odds of drug abuse and religiosity scale.

Multiple logistic regression analysis results

Multiple logistic regression was then carried out and adjusted for age groups, marital status, education level, employment status, monthly income, smoking status, alcohol consumption, resistance to peer influence, self-esteem, family structures and religiosity scale. Thirteen variables were included in the preliminary model; seven variables were found to be significant. In creating contrast, the reference categories used were age group 40-49 years, married, tertiary education, employed, monthly income more than RM 5,000, non-smoker, not consuming alcohol, low resistance to peer influence, normal self-esteem level, living with nuclear family, no changes in family structures, no family members involved in drug abuse and strongly agreed that religious is important in life. The final model (Table 3) showed the risk of drug abuse in age group 20 to 29 years was 7 times higher compared to age group 40 to 49 years (aOR=6.93, 95% CI=1.61, 29.83). Those who were divorced had not significantly increase risk of drug abuse. Comparing education level, those completed up until primary school only had 11 times more risk to abuse drugs compared to those in tertiary level of education (aOR=11.36, 95% CI=1.78, 72.55). Logistic regression was not significant for employment status and monthly income. The final model also showed that cigarette smoking had approximately 11 times higher risk of being a drug abuse compared to non-smoker (aOR=10.56, 95% CI=3.14, 35.56). A person who had consumed alcohol had approximately 9 times higher risk of being drug abuser compared to those who had never consumed alcohol (aOR=9.14, 95% CI=3.75, 22.27). High resistance to peer influence was a protective factor for drug abuse (aOR=0.31, 95% CI=0.16, 0.62). Low self-esteem increases risk of drug abuse by approximately 7 times compared to normal self-esteem individual (aOR=7.34, 95% CI=3.66, 14.72). Individual with family members involved in drug abuse had 4 times risk of being a drug abuse compared to those who had no drug abuse in the family (aOR=4.28, 95% CI=1.80, 10.17). The results showed that those who felt uncertain that religious is important in their life had statistically no significant risk of being a drug abuse (aOR=1.75, 95% CI=0.16, 19.54).

DISCUSSION

The result obtained from this study indicated that risk of drug abuse is multifactorial. Drug abuse is a complex phenomenon, influenced by a diverse set of risk factors, vulnerability to other externalizing disorder and by range of environmental risk factors reflecting lifestyle, marital instability as well as social disequilibrium. The result from multiple logistic regression analysis showed that of all the risk factors for drug abuse, only younger age groups, low education level, smoking, alcohol consumption, low resistance to peer influence, low self-esteem and having family members' involvement in drugs were found to be significantly associated with risk of drug abuse.

In this study, multiple logistic regressions showed that there was a statistically significant relationship between age group and drug abuse. This finding is consistent with studies done by Zain et al. (2007), suggested that the highest risk faced by those age group 20-29 years and decreased after the age of 30 years [6]. Statistical data from NADA also showed that 36.7% of the total drug abuser were from 20-29 years age group [8]. A study done by Dahl (2004) regarding brain development of adolescent suggested that the non-uniform maturation pattern in which the limbic region (emotions) develops faster than the cortex region (reasoning) may significantly contribute to an increase in risk taking and novelty seeking by youth and early adulthood [9]. So, brain maturation during adolescence may promote risk-taking and contribute to decisions to use drugs at an early age. As this early use of drugs trend emerge, risk factors leading to adolescent drug abuse must be continuously assessed in order to design effective prevention and intervention programs to tackle this issue.

The finding of this study indicated that education level significantly has an effect for drug abuse. Multiple logistic regressions showed a significant relationship between education level and risk of drug abuse especially for those that only completed primary education compared to tertiary education. This finding was consistent with national data in which tertiary education only account for 2.7% from the total number of drug abuse in 2016[3]. This was slightly different to the result of a study by Zain et al. (2007), which reported that those with secondary education had the highest risk (aOR=4.0, 95% CI=2.6, 6.0) compared with tertiary education [6]. A study done in Iran showed that diploma or academic education level (OR=0.29, 95% CI = 0.14, 0.60) was a significant protective factor in comparison to lower education level for presence of cocaine consumption [10]. These results suggest that education level may have some influence on those who would abuse drugs. A possible explanation is education helps people to learn skills and develop perceptions of risk. The majority of people who have a higher level of education do not go on to abuse drugs.

The result gathered in this study showed that employment status and monthly income did not have any statistically significant effect on the risk of drug abuse. National data by NADA also showed that only 14% of the registered drug abuses were unemployed [3]. Conversely, a study done in US reported that unemployed compared to employed person were more likely to be involved in illicit drug use (OR = 1.60; 95% CI: 1.44, 1.78) and drug dependence (OR=1.79; 95% CI: 1.55, 2.07) [11]. Income is an important determinant of health, in which individuals who make more income generally experience better health. This result is contradictory in a study in Canada, which reported that level of monthly income was strongly correlated with high risk drug use behaviors. The study found out that the highest income category was significantly and positively associated with daily heroin injection (aOR=2.97, 95% CI=2.33, 3.78), daily cocaine

Table 3: Predictors of drug abuse (adjusted for age, marital status, education level, employment status, monthly income, smoking status, alcohol consumption, peer influence, self-esteem, family structures and religious scale).

Determinants	B	SE	Adjusted odds ratio (95% CI)	*p-value*
Age Groups (years)				
20 to 29	1.936	0.745	6.93 (1.61, 29.83)	0.009*
30 to 39	1.343	0.696	3.83 (0.98, 14.98)	0.53
40 to 49			1	
Marital Status				
Single	0.798	0.431	2.22 (0.95, 5.17)	0.064
Divorced	1.202	0.661	3.33 (0.91, 12.15)	0.069
Widower	-1.449	0.993	0.24 (0.03, 1.65)	0.145
Married			1	
Education Level				
Primary	2.43	0.946	11.36 (1.78, 72.55)	0.010*
Secondary	0.879	0.388	2.41 (1.13, 5.15)	0.024*
Tertiary			1	
Employment Status				
Self-employed	-0.151	0.364	0.86 (0.42, 1.76)	0.678
Unemployed	-2.142	0.991	0.12 (0.02, 0.82)	0.031
Employed			1	
Monthly income				
Less than RM 1,000	-1.578	0.84	0.21 (0.04, 1.07)	0.06
RM 1,001 - RM 3,000	-1.255	0.797	0.29 (0.06, 1.36)	0.116
RM 3,001 - RM 5,000	-0.888	0.941	0.41 (0.07, 2.60)	0.345
More than RM 5,000			1	
Smoking Status				
Yes	2.357	0.619	10.56 (3.14, 35.56)	< 0.001*
No			1	
Ever consumed alcohol				
Yes	2.213	0.454	9.14 (3.75, 22.28)	< 0.001*
No			1	
Resistance to Peer Influence				
High	-1.161	0.347	0.31 (0.16, 0.62)	0.001*
Low			1	
Self-esteem				
Low	1.993	0.355	7.34 (3.66, 14.72)	< 0.001*
Normal			1	
Type of family structure				
Both biological parents without siblings	0.536	0.837	1.71 (0.33, 8.83)	0.522
Single-parents	0.86	1.26	2.36 (0.20, 27.93)	0.495
Grand-parents	-0.058	0.938	0.94 (0.15, 5.94)	0.951
Blended Family	1.747	1.382	5.74 (0.38, 86.19)	0.206
Nuclear Family			1	
Changes in family structures				
Divorcee of parents	0.539	1.215	1.72 (0.16, 18.56)	0.657
Death of parents	0.463	1.222	1.59 (0.15, 17.42)	0.704
No changes			1	
Family members who involved in drug abuse				
Yes	1.454	0.441	4.28 (1.80, 10.17)	0.001*
No			1	
Religion Importance				
Agree	-0.563	0.607	0.57 (0.17, 1.87)	0.354
Uncertain	0.561	1.23	1.75 (0.16, 19.54)	0.648
Strongly Agree			1	

injection (aOR=1.65, 95% CI=1.28, 2.12) and daily crack smoking (aOR=2.48, 95% CI=1.93, 3.17) compared to lowest quartile of monthly income [12].

A possible explanation on this contradictory result would be because this study was done in settlement area and all the respondents in this study were under FELDA's settlements scheme. Employment status and monthly income for each household was nearly the same.

The result of this study showed that smoking did have significant effect on drug abuse. This finding is consistent with the studies by Zain et al. (2007), who reported that ever smoker had approximately 99 times higher risk of being drug addict than non-smoker (aOR=98.7, 95% CI=28.7, 339.5) [6]. A study in US also showed that those who smoked cigarettes were far more likely to use cocaine (OR=7.5, 95% CI=5.7, 9.9), heroin (OR=16.0, 95% CI=6.8,37.9), crack (OR=13.9, 95% CI=7.9,24.5) and marijuana (OR=7.3, 95% CI=6.2,8.7) [13]. Most of the studies suggested that cigarette smoking may be a gateway drug to illegal drug use. Prior researchers also had identified tobacco use as key risk factors for later use of a broader range of substance [14]. The multiple logistic regression showed significant relationship between alcohol consumption and drug abuse (aOR=9.14, 95% CI=3.75, 22.27, p<0.001). This findings is consistent with a study done by Zain et al. (2007), which reported that alcohol consumption was associated with drug addiction (OR=8.3, 95% CI=6.8, 10.3) [6]. A study done in US also reported that alcohol consumption was a significant predictor for any drug use (aOR=29.01, 95% CI=10.6, 79.6) [15].

By using Steinberg and Monahan's Resistance to Peer Influence Scale, it measures an individual's capacity to stand up to peer pressure and behave as he or she wishes. The result of this study found out that peer influence did have significant effects on drug abuse. High resistance to peer influence was found to be a protective factor for drug abuse (aOR=0.31, 95% CI=0.16, 0.62, p=0.001). This is consistent with a study done in Thailand by Wongtongkam, Ward, Day & Winefield (2014), which reported that peer influence is a significant contributor to Thai adolescents' participation in substance abuse [16]. Having friends who use drugs was strongly linked to individuals' usage of drugs, especially marijuana (aOR=6.94, 95% CI=4.12, 11.71) and having delinquent friends was strongly associated with heroin use (aOR=7.13, 95% CI=1.86, 11.01) [16]. Similar findings were found in a study done in Equador which reported that there is a direct relationship between peer influence and drug use (p<0.01) [17]. Peer influence is most likely to take place during teenage years when people are most vulnerable. Low self-esteem has a significant effect on drug abuse. The multiple logistic regression reported significant relationship between low self-esteem and risk of drug abuse (aOR=7.34, 95% CI=3.66, 14.72). This findings is consistent with a study done by Zain et al. (2007), which reported that an increase in self-esteem was associated with a reduced risk of drug addiction (OR=0.4, 95% CI=0.3, 0.4) [6]. This findings also similar with a study done among Chinese adolescent reported that male non-drug users had higher self-esteem than the drug users (p=0.024) [18]. In Nigeria, a study done by Ojo, Akintoyese, Adenibuyan, Adegbohun &Abiri (2013) reported that having low self-esteem was associated with both past year (OR=1.5, 95% CI=3.12, 6.21, p=0.01) and current use of substance (OR=2.2, 95% CI=1.61, 4.32, p=0.01) [19].

Individual who had family members involved in drug abuse do have significant effects on risk of drug abuse. Multiple logistic regression showed that individuals that had family members involved in drug abuse had higher risk of being a drug abuse compared to those who had none drug abuse in the family (aOR=4.28, 95% CI=1.80, 10.17). This is consistent with a Swedish case control study that reported that the risk for drug abuse was substantially higher in siblings (OR=5.29, 95% CI = 5.19, 5.40) [20]. The result gathered in this study found out that religious scale in which individuals' degree of agreement on importance of religion had no significant effect on drug abuse. On the opposite, Zain et al. (2007), reported that those who disagreed that religion was very important as guidance in their life had a significantly higher risk of drug addiction compared to those who strongly agreed (OR=11.8, 95% CI=7.8, 17.6) [6]. These contradictory findings can be explained by looking at the religion of the respondent. As this study only included Malay ethnicity and the majority of them were Muslims, majority of the answer from respondents is 'strongly agree' and none of the respondents answered 'disagree' nor 'strongly disagree'.

One of the limitations in this study is that case groups were registered under NADA, undergo rehabilitation programs and being follow-up by NADA. Their views on self-esteem and religion may have differed from the time when they were not under treatment. Another limitation is that some of the factors of drug abuse were not examined. For example, availability of the drugs is one of the major issues in Malaysia. Bearing in mind the ethical and legal consequences, availability of the drugs factor was excluded in this study. Population based control group were not tested for drugs. Ideally, urine test for drugs should be done to confirm the status of drug abuse in control groups. Respondents in the control group may have concealed their status. In reality, it is not feasible to ask the control groups to undergo urine test for drugs unless there is a police or legal requirements.This study is an unmatched case control study design. Matching could add more power to the study. However, matching was not done due to time limitations.

This study has important implications for drug abuse prevention strategy. From this study, not everyone is at the same risk for drug abuse, thus people at greater risk can be identified and programs and intervention should be developed to meet their special needs. As the saying goes 'individuals' behaviour started at home', more efforts should be focused and directed towards strengthening relationships within the family. Within family itself, potential issues such as smoking and alcohol consumption need to be addressed and identified as these can be a potential for drug abuse later in the future. As the numbers of drug abuse continue to increase in this country, there is a need for integrated community programs at every level to tackle this issue. At school level, school based programs and intervention should be focused on specific groups of students with the known risk factors apart from current practices in which programs are dedicated to the whole schools. At community level, involvement of 'JKKK' (Village Development and Security Committee), FELDA local committee, governments' health clinics, mosque and NADA

is an important strategy to eradicate drug abuse in FELDA. The prevention and treatments programs should start now and need to be continuous for a better FELDA generations.

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