Original article

Substance use and birth weight among mothers attending public hospitals: A case control study

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Abstract

Background: Substance use during pregnancy is greatly underestimated in many parts of the world. Specifically, there are limited up-to-date researches addressing the relationship between substance use and birth outcomes among women in Ethiopia. Therefore, having a study to close the gap and generate firsthand information on the issue is important. The aim of this study is to determine the effect of maternal substance use during pregnancy on the birth weight of a newborn.

Methods*:* The study used analytic facility based case control study, using a face to face interview with a structured and pre-tested questionnaire. The total sample size was allocated to each health facility based on their patient load through proportion to population size, and a total of 112 cases of neonates with low birth weight (weight < 2500gms) were compared with 235 controls of neonates, born with a birth weight above 2500 grams or more. The data were analyzed using both bivariate and multivariable analysis.

Results: - Maternal khat chewing, tobacco smoking and narghile (shisha) smoking during pregnancy and paternal smoking were statistically associated with lower birth weight. However, maternal history of alcohol drinking during pregnancy was not associated with lower birth weight. Mothers who did not attend primary school and having history of previous low birth weight child were statistically associated with low birth weight. Moreover, lesser weight gains during pregnancy and short intra pregnancy interval were associated with low birth weight.

Conclusion: - The association of low birth weight with substance use was strong, particularly, with maternal khat chewing, cigarette and narghile (shisha) smoking including passive smoking during pregnancy. Therefore, we recommend health professionals working in antenatal care service, be aware, on counseling of mothers for banning or lowering use of substance during pregnancy. [*Ethiop. J. Health Dev*. 2017;31(1):27-35]

Key word: Substance use, Pregnancy, Birth weight, Smoking, Khat chewing, Ethiopia

Introduction

Substance use is a socio-economic and major public health problem that societies are facing worldwide. Substance use during pregnancy is a growing health problem affecting the future generation of a country. Alcohol and substance abuse by women during pregnancy has also been reported to be widespread and can affect the unborn fetus with a potential for lifelong mental and physical disabilities (1-4). Substance use during pregnancy can affect the developing fetus, both directly, through passing the placenta and minimizing passage of nutrient through placenta to the fetus. It also affect indirectly, through poor maternal health habits and environmental conditions (5, 6). Although the placenta once was thought to protect the fetus against exposure to toxins, it is now known that metabolites of drugs, including cocaine, opiates, amphetamines, marijuana, and tobacco, to pass through the fetal bloodstream (4, 5, 7). Active metabolites are also known to penetrate the fetal blood-brain barrier and interfere with early neuronal cell development or cause neuronal loss (4, 7).

The prevalence of substance abuse in young adults of both genders has increased markedly over the past 20 years, and nearly 90% of drug-abusing women are of childbearing age (8, 9). However, the exact number of drug-dependent women is unknown, because the statistics relies heavily on voluntary patient disclosure. Research findings concerning the effects of prenatal substance exposure on children's development are often inconclusive and controversial. Prevalence of alcohol drinking habit in Ethiopian women is about 44.7%, and is most common in Tigray (86.3%) and Amhara (78.6%) regional states (10). In Addis Ababa, the magnitude of alcohol drinking habit among women in reproductive age is 51.6%, (10). Magnitude of khat chewing among Ethiopian women was about 11.0%, and it is more chewed in Harari 39.2% and Dire Dawa 27.1% (11). In Addis Ababa, only 5.7% of women, in a reproductive age range, have the habit to chew Khat, (10). Regarding cigarette smoking, in Demographic and Health Survey 2011, only few women (35 women of the 14,000 women in EDHS 2011) responded to use tobacco (10). It is often difficult to quantify the developmental effects of prenatal exposure to a specific substance (12). The development of infants exposed prenatally to substances may be simultaneously affected by numerous factors, including exposure to multiple substances and utilization of prenatal care (12-15).

In Ethiopia, substance use is increasing in some of the major towns including Addis Ababa (11), and birth defects and other problems caused by illicit drugs are completely preventable (16-18). However, research findings concerning the effects of prenatal substance exposure on children's growth and development are often inconclusive, controversial and inadequate. Although there is abundant research on substance use during pregnancy and low birth weight, there have been limited studies depicting presence of association in low resource countries, and to our knowledge there is no study depicting such a study in Ethiopia.

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Presence of evidence at national or local level could increase the scope of the finding and may enhance on promotion of substance use free population especially during pregnancy. Therefore, the aim of this study is to determine the relation between maternal substance abuse and the adverse birth outcome among women giving birth in selected health facilities of Addis Ababa, Ethiopia.

Methods

Study setting: The study was conducted in public hospitals found in Addis Ababa City Administration. With an estimated area of 530.14 square kilometers, this chartered city has a density of 5,607.96 people per square kilo meter, and an estimated population of 2,738,248 (19). According to the 2003 Health and Health Related Indicators publication, by Federal Ministry of Health, Addis Ababa has 33 Hospitals, 52 Health Centers and 35 Health Posts as public health facilities (20). Delivery service and midwifes are available, almost in all health facilities, of which the hospitals are equipped by skilled physicians including obstetrics and gynecology specialists (20). Newbornes delivered in hospitals and health centers are weighed and recorded in a log book prepared for it. The study was conducted in three public hospitals, that are owned by Addis Ababa Health Bureau.

Study design: The study used analytic facility based unmatched case control study to compare maternal substance abuse during pregnancy against new borne birth weight in selected hospitals of Addis Ababa, from March to June 2014. Neonates with low-birth weight were considered as cases while neonates with a normal birth weight above the standard cutoff point were considered as controls.

Source and study population: The source population for this study was pregnant women attending delivery service at public health facilities of Addis Ababa, and the study population for this study were pregnant women who delivered their newborn in selected hospitals of Addis Ababa. In this study, the cases were neonates of pregnant women who delivered a term live singleton newborn baby with birth weight < 2500 grams, while neonates who were delivered as term live singleton newborn with a birth weight $\geq$ 2500 grams, just delivered immediately after the case were considered as controls. Neonates of mothers with chronic illness like (diabetic mellitus, cardiac illness, hypertension), mothers of neonates with disability of hearing or listening or unable to give verbal consent and still borne neonates were excluded from the study.

Sample size and sampling technique: The sample size was calculated using a formula to determine proportion in two populations, with an assumption of prevalence of substance use among the general pregnant women of 4.3%, considered as controls (11). For the calculation, 10% difference between cases and controls of having substance use, with 1:2 ratios between cases and controls, at 95% confidence level, and 80% power was considered. A total of 109 cases and 218 controls are required, but to compensate for possible non-response and incompleteness of data, extra 5% neonates of cases and controls were added. Therefore, a total sample size of 120 cases and 240 controls were included. Every pregnant woman who delivered a term newborn baby, in one of the selected three Hospitals, was eligible for the interview.

The study was conducted in three hospitals: Zewditu Memorial, Yekatit 12 and Mahatma Ghandi Memorial. These hospitals were selected purposively due to their higher level of delivery service in the city (2). The sample size assigned to the hospitals was distributed, proportional to population size, considering their patient load. In each selected health facility, the newly borne neonates, who fulfill the eligibility criteria, were recruited until the share sample size for the facility was complete. In each hospital, a case was the first to be selected, for data collection, while the two consecutive newly born controls were included for interview, and in this study no replacement of eligible newborn was made for those who failed to participate.

Data collection and management:- Data was collected through a face-to-face interview of mothers using structured questionnaire, medical record review. Birth weight of every child was measured in a gram using a pretested and pre-calibrated neonatal weight scale within one hour of delivery. Six experienced nurses, with a diploma or more qualification were recruited as data collectors and two supervisors were recruited to assist the data collection process with main responsibility of checking the completeness of the questionnaire. A two days training was given to the supervisors and data collectors on the objective of the study, the questionnaire content, and the way to keep privacy and confidentiality. The questionnaire was prepared in English at first, translated to Amharic, the local language, and then back to English to check for consistency. The Amharic version of the questionnaire was used as a data collection instrument. The questionnaire was pre-tested in Black Lion Hospital, to identify the clarity of the instrument. All the data were checked for completeness, accuracy, clarity and consistency by supervisors before women were discharged from the hospitals. Missing value for the outcome variable was followed by discarding the study subject from the study. Missing values from the other variables resulted omitting the subject for that analysis.

The outcome variable was having less than 2500 gram birth weight of the newborn while the explanatory variables were socio-demographic characteristics, maternal obstetric history and substance use during pregnancy. Socio-demographic characteristics of the mother include age, educational status, residence, marital status, occupation and religion. Maternal obstetric history including parity, birth intervals, history of abortion and antenatal visit were used as independent variables. Substance use during the current pregnancy of the mother, including alcohol drinking, khat chewing, tobacco smoking, narghile (hubble-bubble) or shisha smoking, cannabis use and other substances with duration and frequency of use during pregnancy. Alcohol drinking was considered

the use of the substance in its traditional form ((Tella, Teg, Areke) or a labeled form like (Beer/ Wine, Whiskey). Tobacco use by a partner during pregnancy was also included as independent variable. Substance use, in this study, was considered when the mother of the newborn uses substances like khat, alcohol, cigarette, narghile (shisha), cannabis, heroin, cocaine, etc. at least once per week during the current pregnancy without a medical prescription.

Data processing and analysis: Data was entered into Epi Data version 3.1 software package, having a specific program for entry of the questionnaire. Random counter checking of the entered data, with that of the hard copy, was employed randomly. On completion of data entry, the data was cleaned by correcting outlier entries. Data was then analyzed using SPSS for windows.

The analysis assessed for difference in socio-demographic characteristics between cases and control newborns. In addition, assessment for association was made for socio-demographic, maternal obstetric history and substance abuse against low-birth weight. After assessing the association between substance abuse and low-birth weight, analysis was made using multivariable analysis. For the multivariable analysis, in a logistic regression, possible confounder variables, from socio-demographic characteristics and maternal obstetric history having strong or borderline ($P < 0.1$) association with the lower birth weight and with the major explanatory variables (substance abuse), were included in the model.

Ethical Consideration: Ethical clearance was found from Research and Ethics Committee of the School of Public Health, Addis Ababa University for appropriateness and scientific content. The study was conducted in the selected health facilities after permission was obtained from the relevant bodies. Informed verbal consent was obtained from mothers of eligible neonates before participating in the study. They were informed regarding the purpose, procedures, potential risks and benefits of the study. Each participant was informed on the right to refuse, ask any question that is not clear and to discontinue interview any time in between for any inconveniences. They were also informed about, absence of denial for any health service benefit, for a refusal. They were also assured of strict confidentiality with regard to any information obtained. Data was obtained after 8-12 hours of delivery, during their maximal comfortable time, in a room having privacy.

Results

Socio-demographic characteristics of the respondent: A total of 112 cases and 235 controls participated in the study, making the response rate 93.33% among cases and 97.9% among controls. The major reason for non-response was when eligible women lack to give informed consent as a result of pain or other complication. For the other three mothers, it was total refusal to participate. In this study, majority of the respondent were between the age group of 15-29 years. Higher proportion of the study subjects were Orthodox Church believers and married or living together with their spouses. Almost half of the mothers were housewives, followed by private sector and government employees. In this study, education status [X^2=28.614, (df=3) P<0.001] and monthly income [X^2=8.257, (df=3) P<0.004] of mothers were associated with low birth weight of newborns. However, there was no significant difference in age distribution, religion, marital status and occupations of the mother as well as the father, (Table 1).

Obstetric history of the respondent: As table 2 illustrates, of the entire respondent, majority (9/10) of the mother had 2 or less children. One in five, of the study subjects reported to have history of abortion. More than four in five had visited ANC clinic for 4 or more times, and about similar number of mothers visited antenatal care service for the first time at a gestational age of 16 weeks or before. Majority of mothers in the two groups had received iron supplement.

Table 1: **Comparison of socio-demographic characteristics of mothers who gave to a lower birth weight against normal (or higher) birth weight in public Hospitals, Oct 2016, (Cases n=112; controls n=235)**

Characteristics	Case # (%)	Control # (%)	Statistics
Age			
15-24	46 (41.1)	95 (40.4)	
5-29	49 (43.8)	86 (36.6)	X^2=3.261
30+	17 (15.2)	54 (54.0)	(df=2) P>0.05
Education			
Never educated	22 (19.6)	8 (03.4)	
Elementary(1-8)	41 (36.6)	87 (37.0)	X^2=26.625
Secondary or more (9+)	49 (43.8)	140 (59.6)	(df=2) P < 0.001
Religion			
Orthodox	82 (73.9)	171 (73.4)	
Muslim	18 (16.2)	37 (15.9)	X^2=0.56
Protestant	11 (9.9)	25 (10.7)	(df=2) P>0.05
Marital status			
Married/living together	100 (89.3)	202 (86.0)	
Single/never married	8 (07.1)	25 (10.6)	X^2=1.077
Divorced/Separated/Widowed	4 (03.6)	8 (03.4)	(df=2) P>0.05
Occupation of the mother			
House wife	51 (48.5)	101 (43.0)	
Government employee	10 (8.9)	37 (15.7)	X^2=3.187
Private sector employee	27 (24.1)	53 (22.6)	(df=4) P>0.05
Merchant	16 (14.3)	31 (13.2)	
Other	8 (07.1)	13 (05.5)	
Occupation of the husband			
Government employee	19 (17.9)	50 (22.8)	
Private sector employee	47 (44.3)	95 (43.4)	X^2 =2.123
Merchant	31 (29.2)	51 (23.3)	(df=3) P>0.05
Other	9 (08.5)	23 (10.5)	
Income			
Unknown	33 (29.5)	42 (17.9)	
<1500 birr	24 (21.4)	46 (19.6)	X^2=8.257
1500-2999 birr	29 (25.9)	65 (27.8)	(df=3) P<0.04
≥ 3000birr	26 (23.2)	82 (34.9)	

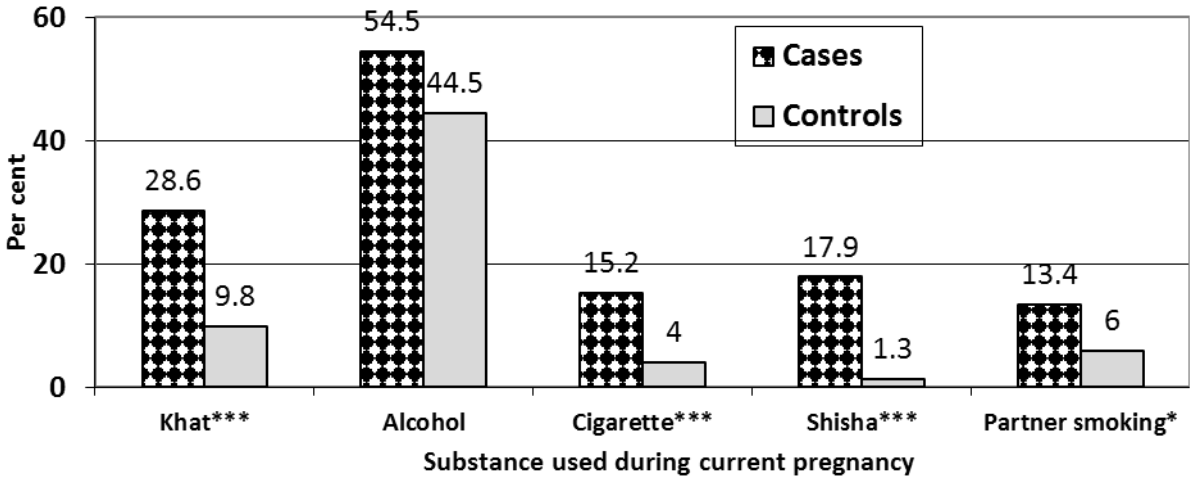
In this study, higher proportion of cases than controls had history of inter pregnancy interval less than two years, and the association is statistically significant, [X^2 =12.3; (df=1); P < 0.001]. Similarly, 19 (17.9%) of cases and 13 (6.2%) of controls reported to have history of giving birth for underweight child in their previous delivery [X^2 =10.557; (df=1); P < 0.0001]. Moreover, 12 (10.8%) of cases and 89 (37.9%) of controls got weight gain of 10 Kg or more during the last pregnancy, and less weight gain during pregnancy was statistically associated with low birth weight, [X^2 =26.7; (df=1); P < 0.0001]. However, in this study, parity of the mother, history of abortion, antenatal care visit status, and history of iron supplement during pregnancy were not associated with low birth weight of the neonate, (Table 2).

Behavioral factors (substance use) among study subjects: Out of 346 study subjects 32 (28.6%) of the cases and 23 (9.8%) of the controls were using Khat during last pregnancy. Moreover, 61 (54.4%) of the cases and 105 (44.5%) controls reported to drink alcohol in the last pregnancy while 17 (15.2%) cases and 1 (4%) of the controls reported to be smokers of tobacco during the last pregnancy. In this study, twenty (17.9%) of the cases and 3 (1.3%) of the controls had practiced smoking narghile (hubble-bubble) or shisha during pregnancy. Similarly, among the respondents, 15 (13.4%) of the cases and 14 (6%) of the controls reported their partners to smoke cigarette during their last pregnancy. In this study, no study participant reported to use other illicit drugs during the last pregnancy (Fig 1).

In this study, khat chewing, cigarette and narghile (shisha) smoking and having a smoking partner during pregnancy were statistically significant with lower birth weight. However, history of alcohol drinking during pregnancy was not associated with lower birth weight, (Fig 1).

Table 2: **Comparison of obstetric history of mothers who gave to a lower birth weight against to normal (or higher) birth weight in public Hospitals, Oct 2016, (Cases n=112; controls n=235)**

Variable	Case # (%)	Control # (%)	Statistics
Parity			
<3 children	102 (91.1)	204 (86.8)	$X^2 = 1.323$
≥ 3 children	10 (08.9)	31 (13.2)	(df=1); P>0.05
History of underweight birth			
Yes	19 (17.9)	13 (06.2)	$X^2 = 10.557$
No	87 (82.1)	196 (93.8)	(df=1); P< 0.001
History of abortion			
Yes	22 (19.6)	46 (19.6)	$X^2 = 0.00$
No	90 (80.4)	189 (80.4)	(df=1); P>0.5
Iron supplement			
Yes	205 (87.2)	93 (83.0)	X^2=1.102.
No	30 (12.8)	19 (17.0)	(df=1); P>0.05
Weight gain during pregnancy			
<10 KG	99 (89.2)	29 (62.1)	X^2=26.7
≥10 Kg	12 (10.8)	89 (37.9)	(df=1); P<0.001
Inter pregnancy interval			
< 2 years	24 (52.2)	21 (22.6)	X^2=12.3
≥ 2 years	22 (47.8)	72(77.4)	(df=1); P<0.001
Number of ANC visit			
≥4	85 (75.9)	205 (87.2)	X^2=7.107
<4	27 (24.1)	30 (12.8)	(df=1); P=0.08
Gestational age at first visit			
Before16weeks	87 (79.8)	174 (78.4)	X^2=0.091.
After 16weeks	22 (20.2)	48 (21.6)	(df=1); P>0.05



Key: * P < 0.05 ** P < 0.01 *** P < 0.001

Figure 1: **Comparison of substances use during pregnancy of mothers who gave to a lower birth weight against normal (or higher) birth weight in public Hospitals, Oct 2016, (Cases n=112; controls n=235)**

Substance use and lower birth weight: Low birth weight was associated to a significant level with women who were substance users like khat, tobacco, narghile (shisha) and women having smoking partner. The chance of giving low birth weight among women who chew khat during the last pregnancy was more than four times higher compared to those women who don't chew. The association was still statistically significant after it was adjusted for weight gain, history of underweight, education, income of the mother, inter pregnancy spacing, [AOR = 2.83; 95% CI; 1.35, 5.93], (Table 3).

The chance of giving low birth weight, among women who were smoking narghile (shisha) during last pregnancy, was more than 17 times higher compared to mothers who did not smoke. Smoking narghile was still statistically significant after it was adjusted for weight gain, history of underweight, education, income of the mother and inter-pregnancy spacing, [AOR=20.10; 95% CI; 3.94, 102.56], (Table 3).

The likelihood of giving low birth weight, among women who were tobacco smokers during the last

pregnancy, was more than 37 fold higher than non-smoker mothers, and after it was adjusted for weight gain, history of underweight, education, income of the mother, inter pregnancy spacing, [AOR = 24.24; 95% CI; 2.79, 210.2]. Similarly, mothers, whose partners were tobacco smokers during the last pregnancy, had about twice-higher chance of giving to a low birth child compared to mothers whose partners did not smoke. Moreover, having a tobacco smoker partner was still significantly associated with low birth weight after it was adjusted for weight gain, history of underweight, education, income of the mother, inter pregnancy spacing, [AOR=1.86; 95% CI; 1.08, 4.91)], (Table 3).

Table 3: **Association between substance use and lower birth weight in public Hospitals, Oct 2016**

Variable	Crude OR (95% CI)	Adjusted* OR (95% CI)
Alcohol		
No	1.0	1.0
Yes	1.45 (0.91, 2.33)	1.45 (0.84, 2.49)
Khat		
No	1.0	1.0
Yes	3.82 (2.02, 7.21)	2.83 (1.35, 5.93)
Cigarette		
No	1.0	1.0
Yes	37.4 (4.88, 286.3)	24.24 (2.79, 210.2)
Narghile (shisha)		
No	1.0	1.0
Yes	16.8 (4.88, 57.9)	20.10 (3.94, 102.56)
Partner Smoking		
No	1.0	1.0
Yes	2.44(1.14, 5.25)	1.86 (1.08, 4.91)

*Adjusted for weight gain, history of underweight, education, income of the mother and inter birth spacing.

Discussion

In recent years, increasing emphasis has been held on substance abuse, and many studies have been conducted to assess the effect of substance abuse during pregnancy on low birth weight. The finding in this study also has attained similar association, indicative of previous researches. Comparison between cases having low birth weight with their controls was assessed for difference in substance use, reproductive health history and some socio-demographic characteristics, crudely and after adjusting for some factors associated or borderline association with low birth weight. The study revealed that there has been statistically significant association between low birth weight and maternal substance use such as khat chewing, cigarette and narghile (shisha) smoking and presence of cigarette smoking partner. Moreover, educational status and monthly income of the mother were found to be statistically significant with neonatal low birth weight.

Lower birth weight was associated with maternal education. The association was strong and this may be explained by the development of higher knowledge, about nutrition and healthcare for a pregnant woman, among educated women, may have resulted on higher birth weight than the non-educated women (21). Although there is no statistically significant association between level of income and low birth weight, there is decrement of proportion of low birth weight with increase in income of the women, and this may be due to educational level and employment status of the women which may be related with increment in income. In this study, inter-pregnancy spacing is related with birth weight and women with inter-pregnancy spacing less-than two years were more prone to give lower birth weight, and is consistent with previous study (22-24). This indicates that the previous pregnancy may have not given the mother to prepare for next pregnancy, affecting gestational weight, and as the time between pregnancies minimizes the effect could be observed in the second child birth weight. Such a lower birth weight may be as a result of rejuvenation of the mother's deficits due to previous pregnancy and its outcome. Weight gain during pregnancy was inversely related with birth weight, and mothers who gained less than 10 Kg during pregnancy were more likely to give birth weight less than 2500 grams. The strong association in this study is consistent with previous studies (25, 26) and this gives more eveidence for cause and effect relationship. Previous delivery of low birth weight child is also related to low birth weight child of the following delivery. In this study, women having history of low birth weight child were more likely to give to low birth weight, and this is consistent to a finding from previous studies (27, 28). The explanation behind the fact is related to repetation of expriencing similar difficulty of retrieving during pregnancy of the newborene as in the previous pregnancy.

In this study, women who chew khat during pregnancy were more likely to give low birth weight child and this may be due to the effect of khat chewing on lowering of appetite (29), or the vaso-constrictive effect of khat on placental vessels (29, 30) which could result in lowering birth weight. Use of tobacco during pregnancy is related with lower birth weight. In this study, smoking was strongly associated with lower birth weight, and is consistent with a study done in a

systematic review and meta-analysis (31) in a cohort study in Spine (32), illustrating that smoking having strong association with lower birth weight. The strong association and its consistency with other studies provides evedence for cause and effect relation of tobacoo use during pregnancy with lower birth weight.

Moreover, the likelihood of maternal use of narghile (shisha) during pregnancy was more than 20 times higher among neonates with low birth weight than among neonates whose weight was 2500 gm or more, and it is consistent to a finding from two studies done in Lebanon (33, 34). This higher level of association supplemented by its consistency with many previous studies, illustrates presence of good evidence that narghile (shisha) smoking to associate with lower birth weight. In this study, passive smoking was assessed in terms of a partner who smokes during pregnancy, and was associated with low birth weight. This has a lot to do with affecting the mother and the fetus (35, 36).

Previous study depicted that alcohol is associated with lower birth weight (37), but in our study, no significant association was found between women who drink alcohol during pregnancy and birth weight, although there is increase in chance of giving low birth weight with drinking alcohol. This may be due to difficulty of assessing the frequency and amount of alcohol drunk during pregnancy in this study. Similar study, examining habitual alcohol consumption during pregnancy was not associated with adverse perinatal outcomes, including birth weight (38).

The use of other substance during pregnancy is likely to be underestimated because respondents often deny substance abuse for fear of judgment or because of feeling shame and guilt. Previous studies have shown that 46% of perinatal illicit drug or marijuana users, who tested positive through toxicological screening, were missed when a questionnaire was used (39).

The study design of using case control may be appropriate to assess for different forms of maternal substance abuse and other possible causes on birth weight. Since it is difficult to measure lower birth weight at community level, use of case control from health facilities may be a proxy estimate in the public. Although many case control studies fail to show temporal relationship, this study has minimized this general limitation of the design, through requesting experience of substance abuse during pregnancy and the birth weight of the neonate immediately after birth. Selection bias, which is feared in most of case controls, has been tried to be minimized through sticking to protocol in selection of study subjects after clinical examination was made. The absence of association between most of the socio-demographic characteristics, between cases and controls depicts that selection bias was less likely to occur in this study. Therefore, this study paves the way to generate valid baseline information.

One of the limitations most likely to occur in this study is inclusion of information bias. This might appear from the self-report of substance use which might introduce social desirability response. Since the study deals with a very personal and sensitive behavior including abuse of substance, obtaining an honest response among mothers, using a face-to-face interview could be hard, and this may result on underestimation of the finding. However, since the limitation seem non-differential,, the observed result may be obscured to the null, so the true finding may be higher than what is found in this study.

Conclusion:

Based on the finding of this study's, low birth weight among others is associated with substance abuse particularly with khat chewing, cigarette and narghile (shisha) smoking during pregnancy. Partner's smoking which may contribute to passive smoking is associated with low birth weight. However, in this study, alcohol drinking during pregnancy was not associated with low birth weight. Therefore, promotion of interventions that lowers substance abuse during pregnancy should be encouraged. Health professionals working in antenatal care service should be given training on counseling of mothers for banning or lowering use of substance abuse.

Contribution of Authors

Both authors contributed extensively to the work presented in this paper. ED initiated the hypothesis; proposal writing and participated in supervising thedata collection, ND participated in designing the project and data collection plan. Both ED and ND participated in the analysis of the data, writing up of the manuscript, and finally ND critically evaluated the manuscript.

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