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Association between Chewing Qat and Low Birth Weight Fetus among Pregnant Women in Al-Gomhori General Hospital in Taiz Residence from June to November 2025 Hospital-based Comparative Cross Sectional Study

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**Association between Chewing Qat and Low
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Abstract:

The results of this study showed that the age between 20-35 years was the most common age for both the qat-chewing and non-qat chewing groups during pregnancy (64%), and most of the participants in both groups (55%) lived in the urban setting with no statistical differences. Women who had completed university education represented the largest percentage in both groups (45%), and most of the women were housewives (76%). The majority of the study group (82%) chewed Qat for 2-4 hours per day, while 16% chewed it for more than 5 hours per. Weekly sessions ranged from 2-4 for 40% of the women, while daily sessions were observed for 52% of the qat-chewing group. There are 28% of both groups smoked shisha, 16% used Mada'a, and only two women smoked cigarettes. Most women in both groups (70%) were multiparas. There were 59% of both groups visited antenatal care clinics. Common comorbidities included diabetes (7%), hypertension (7%), bronchial asthma (3%), and preeclampsia (2%). The most common gestational age at delivery was between 38-40 weeks (77%). There were no statistically significant differences between the two groups ($P = 0.31$) in relation to preterm births. Vaginal delivery was happened for 62% of the participants in both groups and 38% of births being by cesarean section ($P 0.26$). The relationship between birth weight and Qat chewing was statistically significant; birth weights were lower in the Qat-chewers group compared to the non-chewers group ($P 0.03$).

keywords: Qat Chewing, Pregnancy and Low Birth Weight.

Introduction

Qat (*Catha edulis* Forsk) is an evergreen flowering tree or shrub which grows mainly in East Africa and the Arabian Peninsula. It belongs to the suborder Rosidae and family Celastraceae. *Catha edulis* forsk, commonly known as “Chat” in Ethiopia but largely mentioned in the literature as Qat. It is perceived economically, spiritually and socially as the most important plant in many countries of Eastern Africa, especially in Ethiopia, Somalia, Kenya and Yemen.

In Yemen, it has been reported that the prevalence of chewing qat in adult women were found to be 29.6% [1]. Chewing qat, a psychotropic plant, is a deeply rooted addictive habit in Yemeni society [1]. Qat has been cultivated for use as a stimulant for centuries in Yemen, other parts of the Arabian Peninsula as well as the Horn of Africa [2, 3].

In Ethiopia, qat is cultivated in almost all corner of the country on a commercial bases and exported to other countries, specially neighboring countries. It is also freely marketed and consumed within the country more significantly in Eastern Ethiopia, Harar and Dire Dawa. Based on existing evidences, chewing of Qat in Ethiopia is being usual and increasing at an upsetting rate with an estimated prevalence ranging from almost 30% to 53% [2-5]. The highest report being in the Harari region [5]. According to 2016 Ethiopia Demographic and Health Survey (EDHS), about 27% of men and 12% of women had qat chewing practice [6]. Research data on substance use during pregnancy is lacking for most low-and middle-income countries. A study in Yemen, reported 41% prevalence of chewing qat during pregnancy [7]. Documented research evidences of substance use in Ethiopia especially, during pregnancy is limited. According to the existing limited evidences, in addition of adults, the youth and pregnant women are widely chewing qat in Ethiopia. According to recent report, 16.7% [8] of adolescents and 20% [9] of pregnant women in Ethiopia, are practicing chewing qat. In addition, a study done in Eastern Ethiopia showed, 19.6% [10] of pregnant women chew qat. The main quantitatively reported factors in relation to qat chewing in the previous literature [7,9,10] where age, educational levels, residence, income levels, religion status, health status, partner and family qat chewing status. In the same way, observational studies conducted on human in Yemen [13] and in Ethiopia [14] found a significant association between qat chewing during pregnancy and giving birth of low birth weight infants.

Objectives:

- 1- To assess the effect of chewing qat on low birth weight baby.
- 2- To determine whether duration of maternal qat chewing is associated with neonate birth weight.
- 3- To identify other maternal factors associated with low birth weight such as maternal age, parity and antenatal care.

Subjects and Methods**Study Design:**

Hospital-based matched comparative cross sectional study.

Study Setting

The study was conducted at Al-Gomhory Teaching Hospital, Taiz City. This university-affiliated hospital provides 24-hour specialist obstetric care, primarily managed by residents under faculty supervision.

Study Period

The study was carried out over 6 months (From June to November 2025).

Study Population

This study included 100 pregnant women, 50 who chewed qat during pregnancy and 50 women who did not chew qat during the study period.

Inclusion Criteria

- Pregnant women > 28 weeks who delivered at hospital.
- Chewed qat during the current pregnancy
- Willing to participate in this study.

Exclusion Criteria

- Pregnant women who delivered < 28 weeks of gestation.
- Pregnant women who were seriously ill and unable to communicate or answer questions during data collection.
- Pregnant women with severe mental illness.
- Pregnant women who delivered multiple infants (twins or more).

Operational Definitions:**- Qat:**

Is plant containing stimulant alkaloids, most importantly cathinone and cathine.

- Qat chewer:

A participant who reported chewing qat at least twice per week for at least one year, including the current pregnancy.

- Non-khat chewer:

A pregnant women who reported not chewing qat at any time during the current pregnancy.

- Low birth weight:

A live-born infant with birth weight of less than 2500 grams measured within the first hour after birth, regardless of gestational age.

- Normal birth weight:

A live- born infant with birth weight of 2500-4000 grams.

- Birth weight:

The first weight of newborn, measured in grams, using a calibrated digital weighing scale within the first hour after birth.

- Gestational age:

The duration of pregnancy, expressed in completed weeks from the first day of the last normal menstrual period or confirmed by an early obstetric ultrasound when the last menstrual period was uncertain.

- Maternal age:

The age of mother in completed years at the time of delivery.

- Parity:

The number of previous pregnancies that reached fetal viability (usually 28 weeks or more, according to local practice), regardless of whether the infant were born alive or stillborn.

- Antenatal care:

The health care services received by a pregnant women from skilled health professionals throughout pregnancy to ensure the best possible maternal and fetal health.

- Smoking:

Maternal use of cigarettes or other tobacco products during the current pregnancy.

Sample Size

The sample of study was based on the hospital delivery available during the study period, while the theoretical minimum size was low due to the large, assumed effect size, a pragmatic sample size of 50 per group (N=100) was selected to ensure adequate power for subgroup analyses.

Sampling

Purposive sampling was depend on variabllle from labour room. The first 50 woman were qat chewers was selected and the next 50 women were non-qat chewers was selected after matching for age and parity as 1:1 ratio.

Variables

Independent Variable

Qat Chewing During Pregnancy



Birth Weight

Dependent Variable

- Low birth weight

Confounding Variables:

- Maternal age
- Parity
- Antenatal care
- Smoking
- Gestational age

Data Collection Techniques:

The information was collected in a structured questionnaire from 50 pregnant women, selected among pregnant women admitted to obstetric department with singleton pregnancy and > 28 weeks who were qat chewers and 50 pregnant women who were non-qat chewers in Al-Gomhori hospital in Taiz city in period from June 2025 to November 2025.

A structured questionnaire was used which consisted of 28 questions. Data included socio-demographics variables such as age, educational status and occupation.

Other factors include past obstetrics and gynecology characteristics such as gravidity, parity, gestational age, history of abortion, antenatal follow up and other substance use such as tobacco products and presence of chronic medical illness. These data were collected by researcher through direct interview with the participants two hours after delivery. To maintain consistency of data collection tool and facilitated understanding, the questionnaire was first prepared in English and then translated into Arabic language by professional translators. The weight of the newborn was

measured within one hour after delivery using a balanced digital scale and basic newborn care was provided. The scales were calibrated and the reading on each scale was reset to zero prior to measuring each newborn to check the validity of measurement. The process was repeated until the predetermined sample size was achieved. The collected data were checked for completeness, accuracy and clarity. The newborn weight less than 2500 grams was considered low birth weight.

Data Analysis

Data analysis was performed using Statistical Package for Social Scientists (SPSS; Version 24.0; Armonk, NY; IBM Corp) software system. The variables were expressed as number (frequencies) and percentages for categorical variables; means ($\pm$ standard deviations) or medians (interquartile ranges) for continuous variables, depending on distribution normality (assessed using Shapiro-Wilk test). Use Fisher's exact test for bivariate variables and Chi-square test for multivariables.

The strength of association was described by odds ratio and 95% confidence interval (CI), and P-value < 0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was sought from the Research Ethics Committee of Al-Gomhory Teaching Hospital and Taiz University. Informed verbal consent was obtained from the study participants. Confidentiality was strictly maintained; data collection forms used study IDs, and all electronic data were password-protected and stored securely. Only aggregated results are reported.

Results:

There was a 100 pregnant women analyzed in this study which divided into 50 women as Qat chewers and 50 women were non-chewers.

Table 1.

Distribution of sociodemographic variables according to Qat chewing.

Item	Qat chewing		Total	P value
	Yes	No		
Age (year)				0.89
< 20	5(10%)	5(10%)	10	
20 – 35	33(66%)	31(62%)	64	
> 35	12(24%)	14(28%)	26	

Item	Qat chewing		Total	P value
	Yes	No		
Residence				0.11
Urban	31(62%)	24(48%)	55	
Rural	19(38%)	26(52%)	45	
Educational level				0.37
Illiterate	1(2%)	3(6%)	4	
Primary school	8(16%)	4(8%)	12	
Secondary school	21(42%)	18(36%)	39	
University	20(40%)	25(50%)	45	
Occupation				0.001
Housewife	45(90%)	31(62%)	76	
Employed	5(10%)	19(38%)	24	

All % were calculated from column (50).

This table illustrates that out of 100 participants, 10 women aged < 20 years (10%), 64 participants aged between 20-35 years divided nearly equally between those chewing qat 33(66%) and 31(62%) who did not chew qat during pregnancy. The majority of participants residing in urban setting (55) and they have attained secondary education (39) and (45) had university degree, and more than three fourths working as housewives(76). The last variable (occupation) showed a significant association ($P=0.001$) in relation to qat chewing as housewives (45) out of 76 participants used qat chewing during pregnancy compared with employed women.

Table 2.

Pregnancy related characteristics and chewing Qat.

Item	Qat chewing		OR (95% CI)	P value
	Yes	No		
ANC				0.11
Yes	26(52%)	33(66%)	0.5 (0.2-1.2)	
No	24(48%)	17(34%)		
Previous LBW				0.61
Yes	7(14%)	7(14%)		
No	43(86%)	43(86%)	1.0 (0.3-3)	
Chronic illness				0.27
No	37(74%)	43(86%)		
DM	3(6%)	4(8%)		

Item	Qat chewing		OR (95%CI)	P value
	Yes	No		
Hypertension	6(12%)	1(2%)		
Br. asthma	2(4%)	1(2%)		
Preeclampsia	1(2%)	1(2%)		
Subtotal	50	50	100	

The percent of pregnant women who had ANC visits among non-qat chewers was (66%), which was higher than that among the qat chewers (52%) during the current pregnancy. There were 41% of the participants did not attend antenatal care services but the association was not significant ($P=0.11$). Only 14% had previous history of LBW, 7 women had DM, 7 women had hypertension, 3 had bronchial asthma, and 2 women had preeclampsia but the association was not statically significant ($P= 0.27$).

Table 3.

Distribution of fetal birth weight according to qat chewing.

Birth weight (g)	Qat chewing		P value	OR (95%CI)
	Yes	No		
< 1500	3(6%)	0(0%)		
1500 – 2000	6(12%)	1(2%)	0.0001	21.0 (7.5-58.6)
2100 – 2490	33(66%)	9(18%)		
≥ 2500	8(16%)	40(80%)		
Subtotal	50(50)	50(50)		100

This table illustrates the most important findings of this study. Those infants with birth weight <1500g were belonged to women chewing qat, those with birth weight between 1500-2000g had mothers chewing qat (6/7), and 33/42 of women with birth weight 2100-2490g were qat chewers and only 8 women chewers had babies with normal birth weight. From this table it is statistically significant association was observed between qat chewing during pregnancy and LBW, $P=0.0001$.

Table 4.

Relationship between neonatal birth weight and smoking.

Birth weight (g)	Smoking				OR (95%CI)	P value
	No	Shisha	Mada'a	Cigarette		
< 1500	3(5.5%)	0(%)	0(%)	0(%)		
1500 – 2000	5(9.2%)	1(3.5%)	1(6.3%)	0(0%)	0.92 (0.4-2.1)	0.88

Birth weight (g)	Smoking				OR (95% CI)	P value
	No	Shisha	Mada'a	Cigarette		
2100 – 2490	21(38.9%)	15(53.6%)	5(31.2%)	1(50%)		
≥ 2500	25(46.2%)	12(42.8%)	10(12.5%)	1(50%)		
Subtotal	54	28	16	2	100	

This table shows the relationship between neonatal birth weight and type of smoking. Those who used Shisha for smoking had the most frequency of smoking (28%) followed by Mada'a (16%) and only 2 women used cigarette. Among women who used Shisha (53.6%) had birth weight between 2100 – 2490 g. In general Shisha used was showing more frequency of LBW. The association was not significant ($P=0.88$).

Discussion

This study was aimed to investigate the effect of qat chewing during pregnancy on the birth weight. According to previous report from Ethiopia, there is one in ten Ethiopian women chew qat while the corresponding figure in Yemen is 50% [15]. Other studies on pregnant women reported that 25% of Ethiopian pregnant women chew qat less compared to 41% of Yemenis women [16]. According to our study it is very difficult to figure out the association between of qat chewing during pregnancy and LBW because most women deny such habit during history taking.

The present study found that qat chewing habit started early among women less than 20 years and peaked at 20-35 years (64%) then declined gradually after age of 35 years (26%).

The age of pregnant women aged between 20-35 years (66%) more likely to chew qat when compared with those aged less than 20 years (10%). The possible reason may be that as age increase, women are more likely to have changes in life situation such as, bereavement, loneliness, poor social support. This finding consistent with another study from Ethiopia [17] and suggests that qat chewing is a deeply rooted habit and spread across all maternal age.

The present study found that there was no statistical significant difference between women residing in urban setting (55%) and those residing in rural areas (45%) ($P 0.11$) regarding qat chewing habit, may be due to the qat was wide spread in rural areas as urban areas. It is reported that mothers who resided in rural setting were more likely to have low birth weight. This could be attributed to hard working, poor sanitation and an inadequately balanced

diet which ultimately hampers the normal growth and development of the baby among those living in urban areas as attributed to be the urban women attitude towards ANC care and their interpregnancy gap. In addition, qat chewing habit and amount of that consumption appears more in women of rural settings reflecting its availability and relatively cheapness.

Women aged between 20-35 years care at risk of chewing qat and lack of education, due to lack of awareness and knowledge of the negative health risk factors of this habit on the pregnant women and fetus. However, our study focused mainly on the association between qat consumption and low birth weight (LBW).

The present study found that most of the study population had attained high education as 45% had University degree. The distribution of qat consumption according to the educational level revealed that those with primary school use qat chewing double rate of non qat chewing (8 vs 4 women), 21 out of 39 women with secondary school education used qat and slightly decrease qat consumption with advance degree of education. The difference between the level of education and qat use is no significant (P 0.37). It is found in a study from Ethiopia that women with primary school who chew qat during pregnancy represented 58.8% supporting our belief that qat consumption increased with decreasing level of education. Our study showed that the percentage of having an LBW baby were increased among women who were qat chewers daily, weekly, and monthly compared to women who were non-qat chewers during pregnancy. This relationship between chewing qat during pregnancy and LBW may be attributed to the sympathomimetic activity of cathionone, the primary element of qat responsible for its vaso constrictive effects, which complicate pregnancy and birth outcomes. The vaso constrictive effects include maternal tachycardia, preeclampsia, decrease placental blood flow and fetal hypo perfusion, leading to intrauterine fetal hypoxia and limited fetal growth.

The present study found that among 50 women who chewed qat during pregnancy only one mother used qat for less than hour per session, 41 mothers used qat chewing between 2-4 hours per session, and more than 5 hours per session was found in 8 women. Regarding the frequency of sessions per week, our result showed that only 4 women engaged in one session per week, 20 women (40%) engaged in 2-4 sessions per weeks and 26 women (52%)

engaged in a daily sessions. A study [18] suggested that the effect of qat chewing in fetal growth is dose-dependent and more frequent qat use correlates with poorer fetal outcomes likely due to cumulative exposure to cathinone [18].

The present study demonstrated a statistically significant association between maternal qat chewing during pregnancy and the occurrence of low birth weight (LBW). Infants born to mothers who chewed qat had significantly lower birth weights compared with those born to non-chewing mothers ($p = 0.03$). Furthermore, the frequency and duration of qat chewing were associated with an increased risk of LBW, with women who chewed qat for 2–4 hours daily showing a higher frequency of low birth weight infants.

Qat also has sympathomimetic effect resulting in vasoconstriction. The vaso constrictive effects include maternal tachycardia, preeclampsia, reduced placental blood flow and fetal hypo perfusion leading to intrauterine fetal hypoxia, and limited fetal growth [19].

These findings are consistent with several studies conducted in regions where qat consumption is common. For example, a large study conducted among Yemeni pregnant women reported that mothers who chewed qat during pregnancy had a significantly higher proportion of low birth weight infants compared with non-chewers. In that study involving 1,141 deliveries, the incidence of LBW was significantly higher among qat-chewing mothers, suggesting that maternal qat use may adversely affect fetal growth [20]

Similarly, evidence from Ethiopia supports the association between maternal qat use and low birth weight. A case–control study conducted in southern Ethiopia found that maternal qat consumption was strongly associated with LBW, with qat-chewing mothers having a significantly increased likelihood of delivering low-birth-weight infants compared with non-users [21]. Another Ethiopian study also reported that the odds of delivering a low-birth-weight infant were approximately six times higher among mothers who chewed qat compared to those who did not [22].

Conclusions

- Qat chewing during pregnancy is a wide spread habit and this habit is increasing among women.
- Most of the studied women chewed qat in sessions lasting between 2-4 hours, and more than half of women chewed qat daily.

- The most frequent participants in the study group had aged between 20-35 years, had high level of education, residing mainly in urban settings and multipara.
- There was a strong association between qat chewing during pregnancy and low birth weight.
- This study support the dose-dependent effect of qat chewing as those with more sessions showed a significantly high rate of low birth weight.
- There was no increase in the cesarean section rate among both groups, as well as no increase in the preterm birth rate.

Recommendations

1- Health Education for Pregnant Women

Healthcare providers should provide regular education and counseling to pregnant women about the harmful effects of qat chewing during pregnancy, particularly its association with low birth weight and other adverse pregnancy outcomes.

2- Integration into Antenatal Care (ANC)

Screening for qat chewing habits should be integrated into routine antenatal care visits. Pregnant women who chew qat should receive targeted counseling and support to stop the practice.

3- Community Awareness Programs

Public health authorities should develop community-based awareness campaigns to inform families and communities about the risks of qat use during pregnancy and encourage supportive environments for pregnant women to avoid qat.

4- Policy and Public Health Interventions

Government and health policymakers should consider implementing strategies to reduce qat consumption among pregnant women, including health promotion programs and regulation of qat use in public health initiatives.

5- Involvement of Family Members

Since qat chewing is often a social practice, educational interventions should also target husbands and family members to encourage them to support pregnant women in avoiding khat.

6- Further Research

Additional longitudinal and large-scale studies are recommended to better understand the biological mechanisms linking qat chewing to low birth

weight and to evaluate the effectiveness of intervention programs aimed at reducing khat use during pregnancy.

7- Training for Healthcare Workers

Healthcare professionals should receive training on counseling techniques and risk communication related to qat use during pregnancy to improve maternal and neonatal health outcomes.

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