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PREGNANCY COMPLICATIONS IN WOMEN ADDICTED TO PAAN, GUTKA, CHALIA AND NASWAR.

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ABSTRACT

BACKGROUND: The consumption of psychoactive substances during pregnancy remains a pressing global health concern. **OBJECTIVE:** This paper explores the impact of smokeless tobacco (SLT) products such as gutka, paan, naswar or chalia on pregnancy outcome in Karachi Pakistan. **METHODS:** We conducted a cross sectional observational study at Gynecology and Obstetrics Department of Abbasi Shaheed Hospital from June to December 2024. At the time of the study, pregnant women who had developed an addiction to SLT were included. Such patients should have consumed at least one gutka packet per day for a period of more than a year. The demography and clinical examination were assessed in a systematic way including assessment of anemia by complete blood count (CBC). Exclusion criteria included any woman who smoked tobacco or who was suffering from anemia unrelated to tobacco use. We carried out statistical analysis by using SPSS v23. 0 using chi-square tests, odd ratio and independent sample t-tests. **RESULTS:** SLT use during pregnancy was significantly associated with adverse maternal and fetal outcomes with major complications including anemia ($p<0.05$), preterm delivery ($p<0.05$), and congenital defects ($p<0.05$). Prevalence of anemia did not appear to correlate with long-term SLT addiction. These data indicate the serious risks associated with SLT use during pregnancy. **CONCLUSION:** Smoking less tobacco during pregnancy poses serious health risks to women owing to abortion in spontaneous manner (stuck baby syndrome), still births, preterm delivery and low birth weight. This is to augment maternal and neonatal health issues prevalent in Karachi. This study highlights that urgent steps need to be taken in public health to mitigate this problem including efforts at awareness building, policy implementation and culturally sensitive cessation counseling.

KEYWORDS: Smokeless tobacco, maternal outcomes, fetal health, gutka, paan, chalia, naswar.

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INTRODUCTION

The consumption of psychoactive substances during pregnancy remains a pressing global health concern. Among these, chalia and smokeless tobacco (SLT) products such as gutka, paan with tobacco, and naswar—pose considerable risks to both maternal and fetal health. Increasing evidence links their use during pregnancy

to adverse outcomes, including low birthweight, premature delivery, congenital anomalies, and even miscarriage.[1,2,3]

SLT use during pregnancy is a relatively underexplored yet regionally significant public health issue. Globally, pooled SLT prevalence among pregnant women is estimated at 1.3%, with the highest rates observed in Southeast Asia—particularly Bangladesh and India, where prevalence can reach 2.6% or more[4]. In Pakistan, national surveys such as the Global Adult Tobacco Survey (GATS 2014) report SLT use at 8.6% overall, with 3.9% among women.[5] Localized studies in Islamabad have found female SLT use as high as 8.8% (Ali et al., 2014), while the Pakistan Demographic and Health Survey (PDHS 2012–13) estimates SLT use among reproductive-aged women between 1.4% and 2.5% (NIPS & ICF International, 2013). In India, the National Family Health Survey (NFHS-5) reported SLT use during pregnancy at 2.2%, whereas GATS 2016–17 found a higher estimate of 7.4%[6]

Despite these documented patterns, a critical gap exists in the literature: no studies have specifically examined the use of chalia (betel / areca nut) during pregnancy—either as a standalone exposure or in combination with other SLT forms. This omission is significant given chalia's widespread and culturally normalized consumption across South Asia, especially in Pakistan and India.[7] Its categorizing as an independent variable in SLT research e. g. see this article study represents a novel and necessary contribution to maternal health research and tobacco control policy in the region. SLT and chalia use is particularly common in South Asia (fuelled by) deep-rooted cultural norms and widespread misconceptions regarding their perceived health benefits such as help with digestion or oral care[5,8] affordability and accessibility of these products contribute also to their high uptake among women of reproductive age. More than 85 % of the global burden related to SLT and chalia use is concentrated in South and Southeast Asia; India 70 percent, Pakistan 7 percent • and Bangladesh (5%)[5,9] National statistics significant consumption within Pakistan, especially among individuals aged 15–44 years in urban and rural areas (surveys suggest 10% of women aged in 25–64% chewing tobacco or snuff while more than 5.62% smoke huqqa[10] ,Smokeless tobacco is widely consumed in Pakistan, especially among women, in culturally accepted forms such as Naswar, Betel Quid, Chalia/Supari, and Gutka. Iqbal et.al. (2015) highlights its strong association with head and neck cancers, noting that 58% of such cases globally occur in South and Southeast Asia. The rising trend in smokeless tobacco use demands targeted control strategies, particularly in low-income communities where its prevalence is highest.[11] Previous studies have shown association SLT use during pregnancy with reduced birth weight and negative neonatal outcomes[4], also substances commonly used with SLT (e. g. betel leaves and) slaked lime also can be a risky combination as betel leaves, often with tobacco create dependency through dopamine stimulation.[12,13] while slaked lime has been linked to irregular heart rhythms, cardiovascular issues, and obesity[14,5] Numerous SLT and chalia products are carcinogenic and associated with cancers of the oral cavity, pharynx and gastrointestinal tract—placing a substantial burden on already strained healthcare systems in low- and middle-income countries like Pakistan.[6,15] Despite these threats, awareness and cessation initiatives remain scarce, particularly among socioeconomically deprived Populations. Some research has looked at the general risk factors for SLT during pregnancy, local evidence on chalia-related maternal and fetal complications is lacking.

This study addresses that gap by systematically comparing the incidence of maternal anemia and neonatal birthweight

among SLT and chalia users versus non-users. Findings may inform targeted interventions and public health strategies to combat tobacco-related harm among vulnerable populations in Pakistan and similar settings.

MATERAIL AND METHODS

This observational comparative cross-sectional study was conducted from June 1, 2024, to December 31, 2024**,** at the Gynecology and Obstetrics Department of Abbasi Shaheed Hospital, Karachi**,** involving pregnant women at term (37 -41 weeks) who were admitted to the labor room for delivery. After the delivery of baby, participants were informed about the study and the questionnaire content was explained to them. Informed consent was taken from those patients who agreed to participate in the study. The participants were divided in two groups. Group 1 consisted of women who consume beetlenut (chalia) with or without smokeless tobacco including gutka, paan with tobacco, niswar and mawa during the current pregnancy and the group 2 comprising of women who do not consume beetlenut and or SLT.

After obtaining demographic details of the participant's birth weight of the baby (<2.5kg or >2.5 kg) were recorded.

All participants underwent a complete blood count (CBC) to evaluate hemoglobin levels. Participants with hemoglobin of 10.5 or less were classified as anemic.

Patients with other causes of anemia like thalassemia, APH or PPH in current pregnancy, blood transfusion or parenteral iron treatment in the last 3 months were excluded from the study, patients with multiple pregnancy or chronic medical disorders like chronic hypertension, diabetes, chronic renal disease, cardiac disease which could impact on fetal weight were also excluded.

Demographic details, including age, parity, education, socioeconomic status, and gestational age, were recorded using a structured proforma. Additionally, participants were interviewed to determine the duration of their consumption of chalia and or other SLT Data analysis was performed using SPSS version 23.0, where qualitative variables were assessed through simple frequencies and percentages, and statistical evaluations were conducted using chi-square tests, odd ratio test and independent sample t-tests.

RESULTS

Table 1: Descriptive Statistics of the Study Population

Variable	N (Valid)	Mean	Std. Deviation	Min	Max
Age	350	36.5	14.68	15	40
BMI		25.0	4.11	18	40
Gravidity		1.59	0.678	1	>5
Parity		1.55	0.750	0	>5

Quantitative variables were analyzed to determine the mean ±SD, as well as min and max values.

Table 2: Association of Smokeless Tobacco Use with Maternal and Fetal Health Outcomes

No.	Test Variable (Addiction vs.)	Test Value	p-value
1	Gastritis Symptoms	97.643	<0.001
2	Vaginal Infections	160.371	<0.05
3	Anemia in Pregnancy	114.710	<0.01
4	Preterm Delivery	142.494	<0.001
5	PROM (Premature Rupture of Membranes)	166.149	<0.02
6	Congenital Defects	306.644	<0.001
7	IUGR		<0.01
8	Addiction Duration vs. Anemia (Equality of Variances)	t = -1.202 F = 32.402	0.230 <0.001

Qualitative variables were analyzed by the Chi-Square test and independent T test

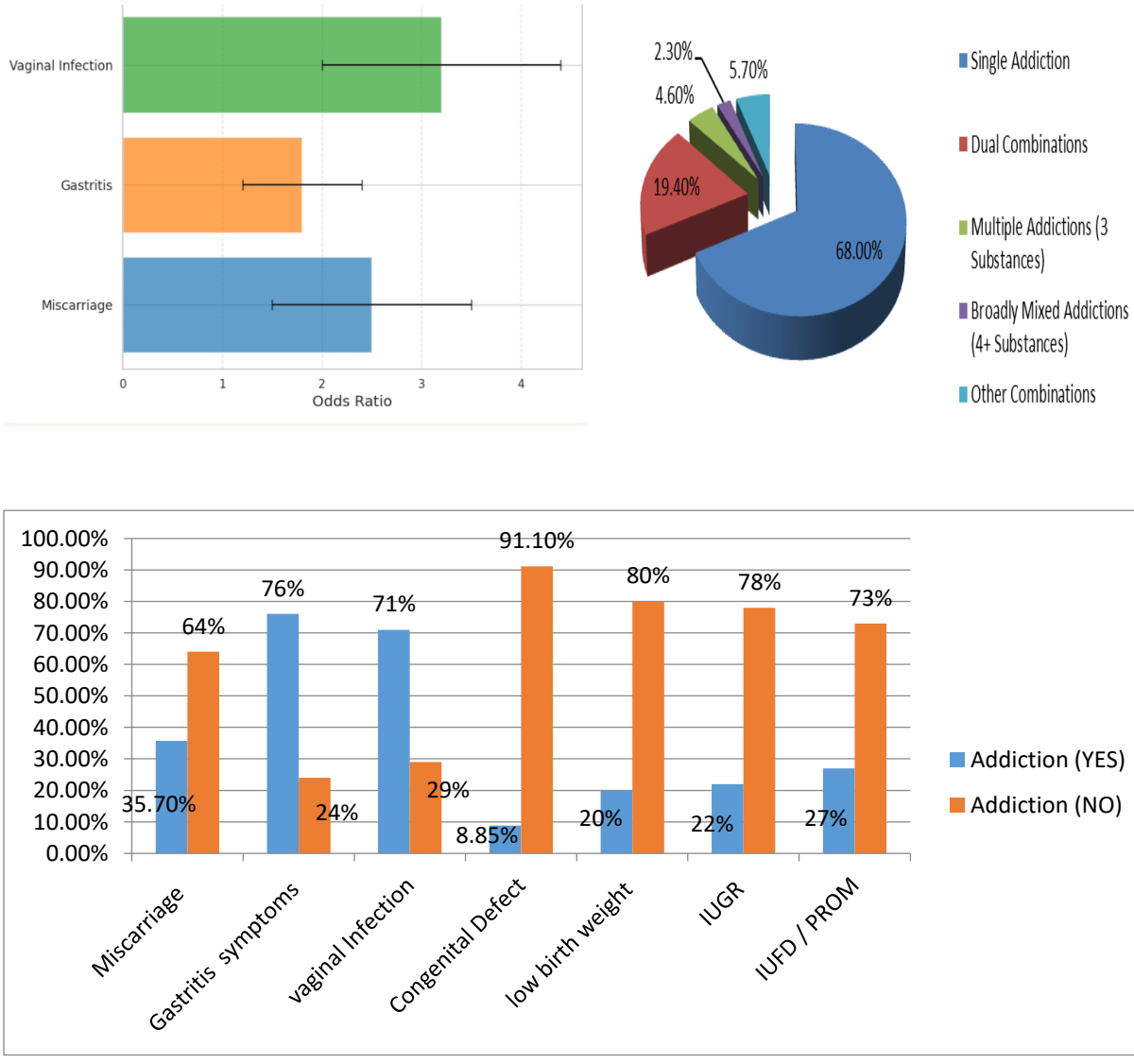

Figure 3: Odd Ratios with 95% CL for Conditions among SLT Users

The participants were predominantly young, with a normal body mass index (BMI) (Mean: 24.92**,** SD**:** 4.25**).** The average gravidity (1.60**)** and parity **(**1.55**)** indicated that most women were experiencing their second pregnancy or delivery**.** Smokeless tobacco (SLT) products, including paan, gutka, and

chalia, were significantly associated with six major pregnancy complications, all showing strong statistical significance (p-values <0.05). However, no notable link was identified between the duration of addiction and anemia (35.7%), though the potential for long-term health effects remains a concern.

Addiction was strongly correlated with anemia (35.7%), vaginal infections (71%), gastritis symptoms (76%), and miscarriage (35.7%), highlighting serious maternal health risks. In contrast, non-addicted individuals exhibited lower rates of these conditions but had higher occurrences of placental abruption (24%), postpartum hemorrhage (PPH) (18%), and hypertension (22%), suggesting differing risk profiles between the groups. These findings underscore addiction as a major risk factor for maternal and fetal complications, emphasizing the urgent need for targeted interventions. Furthermore, while single addiction (68%) was most common, polysubstance use (32%**)** increased health risks, exacerbating poor pregnancy outcomes.

DISCUSSION

While gutka and mawa have been relatively well-studied, chaalia remains under-researched despite its widespread use in South Asia, particularly Pakistan .[16, 17] In a cross-sectional study conducted in Karachi involving 350 pregnant women, a substantial number reported regular consumption of chalia—either in isolation or alongside other forms of smokeless tobacco (SLT)[9]

Although often perceived as less harmful, chalia contains arecoline, an alkaloid associated with vasoconstriction, anemia, and impaired fetal development[18] in the study of chowdhury et al. found that chalia users exhibited higher rates of maternal anemia and low birth weight (LBW), suggesting that areca nut should be incorporated into antenatal screening protocols, public health advisories, and future research efforts.[19]

The study revealed significant associations between SLT uses including gutka, paan, and chalia—and various maternal and fetal complications. Anemia was present in 262 addicted women compared to 88 among non-addicted participants ($p < 0.01$), reflecting earlier findings such as a 70% anemia prevalence in gutka users (Shaikh et al., 2023)[16] and 100% iron deficiency among gutka/mawa users in Thatta (Memon et al., 2022)[17] Interestingly, unlike Shaikh et al., this study did not find a statistically significant link between addiction duration and anemia ($t = -1.202$, $p = 0.230$), indicating that the presence of addiction itself may be a more potent predictor of anemia than its duration.

Low birth weight was more frequently observed among addicted mothers (70 cases) than among non-addicted ones (280 cases), mirroring findings by (Chowdhury et al. 2020)[19] regarding lower birth weights in children of daily betel quid users. Furthermore, addiction showed significant correlations with preterm delivery and premature rupture of membranes (PROM test value = 166.149, $p < 0.02$), reinforcing the hypothesis of SLT-induced intrauterine damage.

The study also reported strong associations between addiction and congenital anomalies as well as intrauterine growth restriction (IUGR), with congenital defects showing a test value of 306.644 ($p < 0.001$). This supports Chowdhury et al.'s (2020) proposal that postnatal catch-up growth may obscure early intrauterine impairments.

In terms of maternal health symptoms, gastrointestinal issues were highly prevalent among addicted women, with 76% reporting gastritis (OR = 10.35, p <0.001)—a novel observation not previously addressed in SLT literature. Vaginal infections were reported in 71% of smokeless tobacco (SLT) addicted women (OR = 5.91, $p < 0.05$), indicating a strong association. The **World Health Organization (2013)** emphasized increased mucosal infection risks during

pregnancy due to SLT use, validating the clinical significance of our findings. [20] Although Islam (2022) did not directly assess reproductive health, his study revealed that SLT users are less likely to attempt quitting, highlighting persistent exposure among women.[21] This behavioral pattern complements our results by showing how prolonged SLT use may contribute to reproductive health risks. Together, these studies reinforce the link between SLT consumption and adverse outcomes in women's reproductive health.

Miscarriage rates stood at 35.7% among addicted participants. While this initially seemed contradictory, odds ratio analysis revealed that addicted women faced 2.23 times greater odds of miscarriage compared to their non-addicted counterparts. This outcome corresponds to known teratogenic effects of nicotine and arecoline.[19]

A key innovation in this study is the distinct evaluation of chalia as an independent SLT exposure—an area neglected by prior research. Additionally, 32% of addicted women reported using more than one type of SLT, and this subgroup experienced more severe complications, pointing to additive toxic effects. This aspect was not addressed by Shaikh et al. (2023) or Memon et al. (2022), highlighting the necessity for antenatal care frameworks and public health initiatives to incorporate awareness of polysubstance SLT use.

Conclusion and Recommendation: Our study found the adverse effects of SLT and Chalia use during pregnancy, particularly in relation to anemia, LBW, IUGR, congenital defects, and maternal infections. As SLT remains culturally accepted and widely used—especially among low-income and uneducated women in Pakistan—these findings underscore the urgent need for antenatal SLT screening protocols, targeted public health campaigns, policy-level regulation of chalia and other SLT products, and longitudinal studies to assess developmental and metabolic risks in SLT-exposed offspring.

ETHICS APPROVAL: The ERC gave ethical review approval. REFF: 13/22 DATED27/04/2022.

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin.

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REFERENCES

1. Chaudhary J, Gupta E, Singh PK, Singh S. Tobacco exposure among antenatal women in India: Challenges in tobacco screening & cessation counselling. Indian J Med Res. 2023 Nov 1;158(5-6):477-82. doi:10.4103/ijmr.ijmr_188_23. PMID: 38088423; PMCID: PMC10878484.
2. Saeed S, Lakho N, Mahmood A, Parveen T, Memon R, Khatoon F. Prevalence of anaemia among gutka addicted pregnant women. J Soc Obstet Gynaecol Pak. 2020;10(3):180-4.
3. Wells AC, Lotfipour S. Prenatal nicotine exposure during pregnancy results in adverse neurodevelopmental alterations and neurobehavioral deficits. Adv Drug Alcohol Res. 2023 Aug 11; 3:11628.
4. Singh RJ, Tripathy JP, Lal P, Sahu S. Smokeless tobacco use among pregnant women in low- and middle-income countries: A systematic review and meta-analysis. Matern Child Health J. 2021;25(3):402-10.
5. Siddiqi K, Shah S, Abbas SM, Vidyasagaran A, Jawad M, Dogar O, Sheikh A. Global burden of disease due to smokeless tobacco consumption in adults: Analysis of data from 113 countries. BMC Med. 2015; 13:194.

6. International Institute for Population Sciences (IIPS). National Family Health Survey (NFHS-5), 2019-21: India. Mumbai: IIPS; 2021.
7. World Health Organization. Tobacco and its impact on maternal health. Geneva: WHO; 2021. Available from: https://www.who.int
8. National Institute of Population Studies (NIPS), ICF International. Pakistan Demographic and Health Survey 2012–13. Islamabad (PK), Calverton (MD): NIPS and ICF International; 2013.
9. Khabir M. Exploring gutka consumption: Healthcare risks on maternal and child health in Karachi, Pakistan. Addiction. 2024 Dec;119(12):2221-2.
10. Mufaddal T, Rizvi SA, Ali ST. Effect of tobacco use during pregnancy on fetal birth weight born to women between 18–35 years in Thatta District. Liaquat Natl J Prim Care. 2024;6(1):1-6.
11. Iqbal N, Irfan M, Ashraf N, Awan S, Khan JA. Prevalence of tobacco use among women: a cross-sectional survey from a squatter settlement of Karachi, Pakistan. BMC Res Notes. 2015;8:469.
12. Arora M. Eating betel leaf (paan) during pregnancy – Is it safe? Internet. FirstCry Parenting. 2024. Available from: https://parenting.firstcry.com/articles/eating-betel-leaf-paan-during-pregnancy-benefits-and-risks/
13. Islam MR, Aktar S, Pervin J, Rahman SM, Rahman M, Rahman A, Ekström EC. Maternal betel quid use during pregnancy and child growth: a cohort study from rural Bangladesh. Glob Health Action. 2024;17(1):2375829. doi:10.1080/16549716.2024.2375829.
14. Sajid TZ, Usmani RA, Mumtaz U, Riffat N, Baig S, Cheema MH. Association of low birth weight with environmental tobacco smoke (ETS) exposure among pregnant women. Prof Med J. 2022;29(4):448-58. doi:10.29309/TPMJ/2022.29.04.6274.
15. Khan A, Afridi SH. Smokeless tobacco: Carcinogenic properties and public health implications. Pak J Med Sci. 2021;37(4):1170-5. doi:10.12669/pjms.37.4.4478.
16. Shaikh A, Hussain S, Ahmed R, Khan M. Prevalence of anemia in gutka addicted pregnant women in Karachi. J Matern Health Stud. 2023;12(3):101-8.
17. Memon N, Qureshi F, Baloch S, Shah Z. Prevalence of gutka/mawa addiction and anemia in pregnant women in Thatta District. Sindh Med J. 2022;11(2):45-51.
18. Shaheen R, Karim S, Maheshwary N. Prevalence of gutka/mawa addiction in pregnant women and causing iron deficiency anemia. J Soc Obstet Gynaecol Pak. 2023 Sep 20;13(3):392-5.
19. Chowdhury R, Sinha B, Sankar MJ, Taneja S, Bhandari N, Rollins N, Martines J. Maternal betel quid use and child growth outcomes in rural Bangladesh: A cohort study. Int J Epidemiol. 2020;49(1):231-40.
20. World Health Organization (WHO). World health statistics 2013. Geneva: WHO; 2013. Available from: https://www.who.int/publications/i/item/9789241564588
21. Islam MM. Comparison between smokers and smokeless tobacco users in their past attempts and intentions to quit: Analysis of two rounds of a national survey. Int J Environ Res Public Health. 2022; 19(20):13662.