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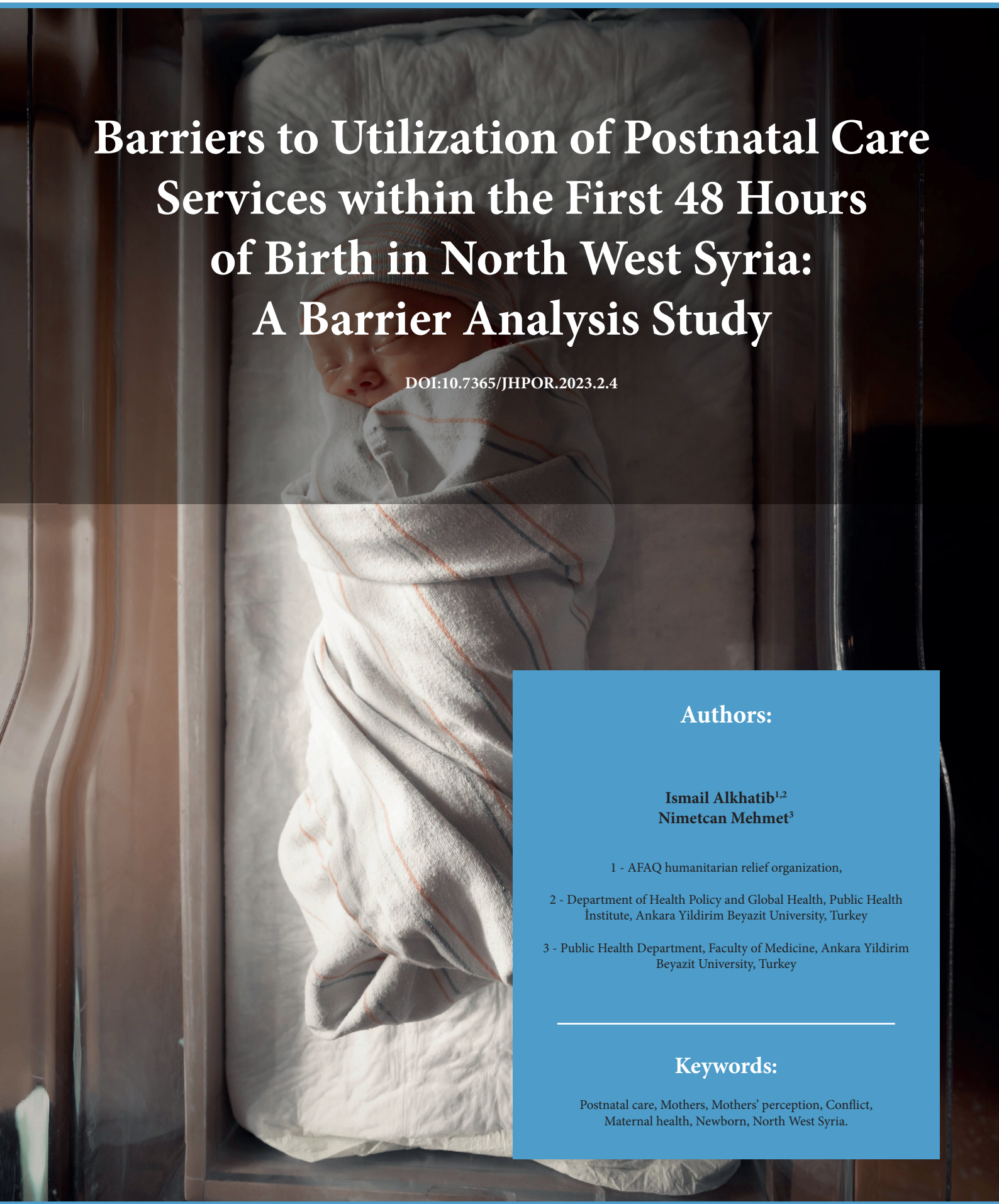

Barriers to Utilization of Postnatal Care Services within the First 48 Hours of Birth in North West Syria: A Barrier Analysis Study

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Abstract

Objectives:
The objective of this study is to identify barriers to the utilization of postnatal care services among mothers and neonates in a conflict-affected area.

Methods:
This study involves a cross-sectional survey utilizing the Barrier Analysis (BA) approach, which is based on the Health Belief Model and the Theory of Reasoned Action. It explores up to 12 recognized determinants of behavior adoption. The survey was conducted in six communities located in Idlib and western rural Aleppo, representing both urban and rural areas for host and displaced populations in northwest Syria (Selwa, Abin Samaan, Sahara, Tal Elkaramej, Boz Ghaz, Koknaya). Data collection took place from 7th to 11th November 2021. Initially, screening questions were used to verify participants' eligibility for the survey. The interviewed mothers were then classified into two main groups: the first group consisted of mothers of newborns who attended postnatal care within the first 48 hours after birth (DOERS), while the second group comprised mothers of newborns who did not attend postnatal care within the first 48 hours after birth (NON-DOERS). From both groups, a random sample of 90 mothers of newborns aged 0-6 months was selected (45 DOERS and 45 NON-DOERS) out of a total of 418 respondents. Their answers were analyzed based on the 12 determinants included in the questionnaire. All collected data, including coded qualitative data and closed-ended questions, along with their frequencies, were entered into the Standard Barrier Analysis Tabulation Sheet Excel (SBATS). The odds ratio and P-value were calculated, considering results to be "significant" if the P-value was less than 0.05.

Results:
All demonstrated significant results are being compared between doers (mothers who attend postnatal care within the first 48 hours after birth) and non-doers (mothers who did not attend postnatal care within the first 48 hours after birth) according to the determinants and based on their recurrence, not their percentage. A total of 90 mothers with newborns aged 0-6 months (45 DOERS and 45 NON-DOERS) were interviewed, the findings revealed that 68% of the interviewed mothers had a normal delivery at health facilities, while 20% had a cesarean delivery, and 12% had a normal delivery at home. The barriers to PNC services included the long distance of the health facilities and the absence of transportation, social norms and traditions that prevent women from leaving home after childbirth, overcrowding at health facilities, fear of COVID-19 infection when visiting health facilities, absence of accompanying people, and the perception among mothers that they were unlikely to experience immediate post-birth problems. On the other hand, the enablers for accessing postnatal care services included community-based health support through community health workers, awareness of the available services, the mother's level of education, and a perceived understanding of the risks associated with medical complications that may arise after birth. Additionally, the availability of transportation and economic resources played a facilitating role in accessing postnatal care services.

Conclusion:
This study examines the low uptake of postnatal care (PNC) services for mothers and neonates in a conflict-affected area. Findings highlight barriers including limited maternal knowledge, inadequate health service coverage, transportation challenges, and social norms.

Introduction:

Mothers and their newborns in the postnatal period are highly vulnerable to illnesses and deaths, particularly in low-income and middle-income countries. An estimated 287 000 maternal deaths occurred worldwide in 2010.[1] The immediate postnatal period, encompassing the first 24 hours after childbirth, carries the highest risks for postpartum hemorrhage and other significant morbidities, close direct or indirect supervision by a skilled attendant is required in this period so that any problems can be identified promptly, and appropriate intervention or referral can take place. To mitigate these risks, the World Health Organization (WHO) recommended the provision of postnatal care PNC for all mothers and their neonates regardless of where delivery occurs as early as possible within 24 hours of birth to assess the main vital signs and identify any danger signs promptly. (WHO

Recommendations on Postnatal Care of the Mother and Newborn, n.d.). Early postnatal care enables the early detection of medical complications for both mother and newborn during the critical postpartum period, such as excessive bleeding, fever, or neonatal problems.[3]

Syria has experienced nearly 12 years of political instability and military conflict as a result of the onset of a civil revolution against the Syrian regime on 15 March 2011. The Syrian conflict considers one of the most complicated conflicts in the world in the 21st century. the humanitarian situation there is very bad and the number of people in need increases day by day. Syria's complex conflict involves multiple spheres of influence; The Syrian Regime, Turkish-backed Armed Forces (TBAF) in Northern Aleppo, Hayat Tahrir Al-Sham (HTS) in Idlib province, Islamic State (IS) in a small area in the extreme eastern part of the Syrian Desert, and Syrian Democratic Forces (SDF) controlled areas in North-eastern part of Syria.[4] Among these, the North West Syria (NWS) region, which comprises Northern Aleppo and Idleb Province controlled by TBAF and HTS consequently, is home to approximately 4.6 million people according to the humanitarian needs overview of Syria HNO 2023.[5] including a substantial population of internally displaced individuals, with women accounting for 23% and children for 56% of those living in IDP sites.[5,6] Furthermore, in the whole of Syria, there are 4.2 million women of reproductive age in need to receive essential sexual reproductive health services, such as antenatal care, safe deliveries, postnatal care, and family planning.[5] The protracted conflict in Syria has had devastating effects on health services, leading to the widespread deterioration of physical infrastructure. Hospitals and primary healthcare centers. This cumulative impact has pushed the health system to the brink, exacerbated by various factors including the COVID-19 pandemic as the cumulative number of COVID-19-associated deaths during the last three waves in Northwestern Syria (NWS) amounted to 1,362 fatalities,[7] economic downturn, displacement movements, high cost of health services, inadequate quality of care, scarcity of medicines and supplies, shortage of skilled health staff, and overcrowding leading to long wait times for healthcare services. Consequently, these challenges have significantly impeded the utilization of essential reproductive health services.[8]

There is limited research on postnatal care PNC services in Syria, particularly in NW Syria, where the seeking for postnatal care during the postpartum period is rather ignored or neglected. In light of the aforementioned gaps in postnatal care utilization within the first 48 hours of birth in North West Syria and given the paucity of information on postnatal care in Syria, this study aims to: Assess the utilization of postnatal care among mothers of newborns during this critical period, analyze the barriers and enablers that influence access to postnatal care services in the region, provide valuable insights for policymakers and healthcare providers to strengthen the delivery and uptake of postnatal care, and ultimately contribute to the development of evidence-based interventions aimed at strengthening the delivery and uptake of postnatal care services, ultimately leading to improved maternal and neonatal health outcomes.

Material and Methods:

Study design:

This study involves a cross-sectional survey utilizing a Barrier Analysis (BA) approach, using individual interviews, as specified in the Practical Guide to Conducting a Barrier Analysis (2013).[9] following the 7 steps of the barriers analysis process. The first step involved defining the behavior to be analyzed, which in this case was the utilization of postnatal care services within the first 48 hours of birth in North West Syria. The next step was to determine the behavioral determinants that influence this behavior. Subsequently, a barrier analysis questionnaire was developed to guide the data collection process. Data was then collected through individual interviews. The collected data was analyzed to identify priority barriers that hindered the utilization of postnatal care services. Based on the analysis, recommendations were developed to address the identified barriers. Finally, the recommendations were validated and refined, ensuring their relevance and effectiveness in improving the utilization of postnatal care services in the study area.

The Barrier Analysis survey is a formative research method using a Barrier Analysis (BA) rapid assessment tool used in community health and other community development projects to identify behavioral determinants associated with a particular behavior, identify the factors that are preventing a target group from adopting a preferred behavior, as well as identifying the facilitators or motivators to adopting the behaviors by a target group in a targeted area. These behavioral determinants are identified so that more effective behavior change communication messages, strategies, and supporting activities can be developed. The BA approach is based on the Health Belief Model and the Theory of Reasoned Action and explores up to 12 recognized common determinants of behavior adoption. It focuses on the following 12 determinants:

Setting, Sampling, and Sample Size:

As this study somehow is similar to a case-control study, it is not necessary to have as rigorous a sampling method or to use population-based sampling. A sample size of 45 individual Doers and 45 individual Non-Doers is recommended, as this usually gives the best results in Barrier Analysis. Nevertheless, for results to be representative of most of the people in the area and according to BA methodology, purposive sampling was used, the sampling frame was drawn to ensure representation of both urban and rural areas, including host communities and internally displaced people to avoid any issues that may impact the practice of the behavior. The sampling frame consisted of 15 subdistricts in northwest Syria, specifically in Idleb and Aleppo governorates. From this frame, three subdistricts (Dana, Qurqania, Atareb) were randomly selected, then went to communities that were treated as clusters for further sampling, 2 communities (6 communities in total; Selwa-Abin Samaan-Sahara-Tal Elkaramej-Boz Ghaz, Koknaya;), were randomly selected in each subdistrict out of 57 communities located in the three subdistricts which already had been selected, within these communities, households were chosen using a random sampling method, with 100 households selected in each community. The target population for this study was mothers with children aged 0-6 months. To identify eligible participants, an initial screening question was asked: "Do you have a child under 6 months old?" A total of 418 respondents were identified as eligible mothers and included in the survey. Based on the classification of the interviewed mothers into two groups (DOERS and NON-DOERS), 169 mothers were categorized as DOERS (mothers who attended postnatal care within the first 48 hours after birth) and 249 mothers as NON-DOERS (mothers who did not attend postnatal care within the first 48 hours after birth). From these groups, a random selection of 90 mothers was made, with 45 DOERS and 45 NON-DOERS included in the final analysis. This sampling approach, with a total sample size of 90 mothers, was deemed appropriate for conducting a Barrier Analysis and yielded representative data for analyzing the 12 determinants outlined in the questionnaire.

Data collection:

Prior to data collection, a two-day training was conducted to familiarize the field teams with the barrier analysis methodology outlined in the Practical Guide to Conducting a Barrier Analysis (2013). The questionnaire used in this study was initially developed in English, following standard guidelines for questionnaire design. To ensure accurate translation, the questionnaire was then translated into Arabic by a native Arabic-speaking translator and reviewed by the data collection team during the training phase. Subsequently, the questionnaire was transformed into a KOBO tool to facilitate data collection.

The questionnaire begins with a title that specifies the behavior under study and the target group, namely "Mothers of newborns who attend a postnatal consultation within 48 hours/2 days after delivery." The first section captures demographic information, including details about the interviewers, while ensuring the anonymity of the surveyed mothers. This is followed by a scripted introduction, where the interviewer introduces themselves, explains the purpose of the survey, outlines the expected time commitment, clarifies how the results will be utilized, communicates the conditions of participation, and emphasizes the confidentiality policy. Prior consent is sought from the interviewees, highlighting the voluntary nature of their participation. Section A of the questionnaire comprises behavior screening questions and a Doer/Non-Doer classification table. This is followed by Section B, which consists of research questions related to 12 determinants.

The survey was conducted in six communities, namely Selwa, Abin Samaan, Sahara, Tal Elkaramej, Boz Ghaz, and Koknaya. A total of 12 field interviewers were assigned to conduct the interviews, organized into six teams of two. In total, 90 mothers were interviewed. Data col-

Table 1. Determinants of behavior adoption method

1	Self-efficacy	An individual's belief that he/she has the knowledge and skills to implement the behavior
2	Positive consequences	What positive things the individual believes will happen as a result of implementing the behavior (advantages)
3	Negative consequences	What negative things the individual believes will happen as a result of implementing the behavior (disadvantages)
4	Social norms	The perception that people close to the individual think he/she should implement the behavior
5	Access	Degree of availability of the products or services needed to implement the behavior
6	Perceived Susceptibility / Perceived Risk	An individual's perception of how susceptible they are to the problem the behavior is meant to address
7	Severity	An individual's perception that the problem (which the behavior is meant to address) is serious
8	Action Efficacy	An individual believes that by practicing behavior one will avoid the problem (which the behavior is meant to address).
9	Safety	How safe would it be for you to do the behavior
10	Divine Will	An individual's belief that it is God's will that the problem exists and that they are powerless to overcome it
11	Culture	The history, customs, lifestyle, and values of a self-defined group may influence the implementation of a behavior
12	Universal motivators	Factors found to motivate most people, irrespective of other variables.

lection took place between the 7th and 11th of November 2021. During the interviews, eligible participants were screened and classified as either Doers (mothers who attended postnatal care within the first 48 hours after birth) or Non-Doers (mothers who did not attend). Based on their classification, specific questions were posed to each group. The questionnaire included a combination of open-ended questions to explore and describe the perspectives of the participants and closed-ended questions to identify significant differences. The data collection process adhered to a systematic approach, ensuring the collection of comprehensive and reliable data on the barriers and enablers influencing the utilization of postnatal care within the first 48 hours after birth in the study area.

Data Management and Analysis:

The tool being used for analyzing the data is the Standard Barrier Analysis Tabulation Sheet "SBATS", through this tool, the data analysis process was performed after a random selection of the 45 doers/45 non-doers sample out of 418 respondents. All collected data (coded qualitative data and closed-ended data) and their frequencies were entered into the standard Barrier Analysis Tabulation Sheet MS Excel to calculate the odds ratio and P-value for each response according to the 12 determinants, and the results were considered "significant" in case of the P value is less than 0.05. All demonstrated/significant results are being compared between doers and non-doers according to the determinants and based on their recurrence, not their percentage.

Results

Demographic Characteristics:

The sociodemographic information of the 90 interviewed mothers was as follows, in terms of age, it was observed that 14 mothers (15.6% of the sample) were under 18 years old, indicating a significant proportion of adolescent mothers. The majority of the respondents, comprising 76 mothers (84.4% of the sample), were above 18 years old. Regarding residency status, the data showed variations among the respondents. Out of the total sample, 48 mothers (53.3%) were identified as internally displaced people (IDPs), indicating that they had been forced to flee their original homes due to conflict or other circumstances. Additionally, 40 mothers (44.4%) belonged to host communities (HCs), representing individuals residing in areas not directly affected by displacement. The remaining 2 mothers (2.2%) were classified as returnees, indicating that they had previously been displaced but had recently returned to their original homes.

Level of Education: As shown in Table 2, which also illustrates the education status of the surveyed mothers, the findings indicate that 35.6% of the mothers had completed primary school education. Furthermore, 32.2% had completed intermediate school, while 18.9% were found to be illiterate. A smaller percentage of the surveyed mothers had achieved higher levels of education, with 6.7% having completed high school and another 6.7% holding university or institute certificates. These results suggest that a significant portion of the surveyed mothers had limited formal education, with the majority having completed only primary or intermediate levels. This may have implications for their understanding of healthcare information and their ability to make informed decisions regarding postnatal care.

Table 2. Sociodemographic information of the participants:

Variable	Frequency	Percentage (%)
Age group		
Under 18 years	14	15.6
Above 18 years	76	84.4
Residency status		
Internally displaced people (IDPs)	48	53.3
Host communities (HCs)	40	44.4
Returnees	2	2.2
Level of Education		
Completed primary school	32	35.6
Completed intermediate school	29	32.2
Completed secondary school	6	6.7
Completed University/Institute	6	6.7
Illiterate	17	18.9
Total	90	100

General results of reproductive health services:

Delivery method and place: As shown in Chart 1 which displays the delivery method of 90 interviewed mothers with child aged 0-6 months, the findings indicate that among the 90 interviewed mothers with children aged 0-6 months (45 DOERS and 45 NON-DOERS), 68% had a normal delivery at health facilities, 20% had cesarian delivery, and 12% had a normal delivery at home. This suggests that the majority of mothers chose to give birth in healthcare settings, emphasizing the importance of accessing professional care during childbirth. However, a small percentage of mothers opted for home deliveries, which may carry potential risks.

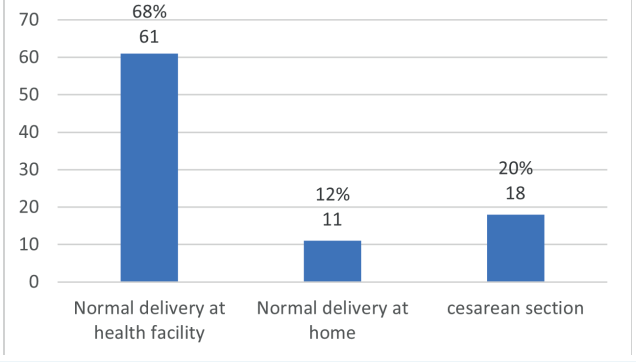

Figure 1. delivery method of mothers with children aged 0-6 months.

Home delivery:

The study further explored the reasons behind home births, identifying six common factors reported by both doers and non-doers. Multiple reasons were stated by some mothers. The findings, presented in Figure 2, reveal that the main reason for home births was the long distance to health facilities, accounting for 32% of the reasons. The absence of transportation was another significant factor, contributing to 23% of the reasons. Social norms and cultural factors played a role in 18% of the cases. Other reasons included suddenly occurring birth at home (14%), husband refusal (9%), and fear of COVID-19 infection (5%). These findings shed light on the various factors influencing the decision to have a home birth, with accessibility, transportation, cultural norms, and concerns about the pandemic being prominent considerations.

Complications after delivery: The below table provides an overview of the reported complications after delivery among both doers and non-doers, considering that some mothers experienced more than one complication. Out of the total sample of 90 mothers, 50 (28 doers and 22 non-doers) reported no complications after delivery. The most prevalent complications were bleeding and postpartum fever, accounting for 20.84% of all reported complications. Non-doers had a higher incidence of bleeding (60%) compared to doers (40%). Both bleeding and postpartum fever were reported at a rate of 10.42% each. Other reported complications included back and stomach pain, which accounted for 8.33% of the total complications, and uterine contractions, which represented 7.29%. The remaining group of complications combined made up 11.46% of the total complications reported. These findings highlight the occurrence of various post-delivery complications, with bleeding and postpartum fever being the most common. It is noteworthy that non-doers experienced a higher frequency of complications overall.

COVID-19 impact:

During the survey, mothers were asked about the impact of the COVID-19 outbreak on their lives. Out of the total sample of 90 mothers, 55 mothers (61%) reported no negative impact from COVID-19, with 24 mothers being doers and 31 mothers being non-doers. However, 35 mothers (39%) mentioned facing challenges associated with the pandemic, with 21 mothers being doers and 14 mothers being non-doers. Among the 35 mothers who experienced challenges related to COVID-19, 23 mothers reported limited access to health services due to fear of COVID-19 infection. This fear may have discouraged them from seeking necessary healthcare during the postnatal period. Additionally, 10 mothers faced moving restrictions

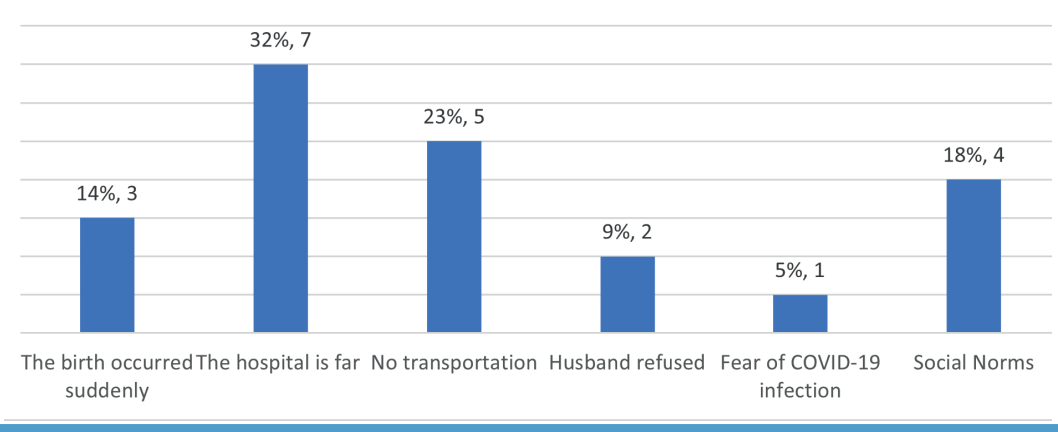

Figure 2. Reasons for home births.

Table 3: Complications after delivery.

Complication	Doers, n (%)	Non-Doers, n (%)	Grand Total, n (%)
Bleeding	4 (8.33)	6 (12.50)	10 (10.42)
Hypertension	0 (0)	1 (2.08)	1 (1.04)
Constipation	0 (0)	1 (2.08)	1 (1.04)
Uterine contraction	3 (6.25)	4 (8.33)	7 (7.29)
Exhaustion	0 (0)	4 (8.33)	4 (4.17)
Back and stomach pain	5 (10.42)	3 (6.25)	8 (8.33)
Pain at the site of the wound	3 (6.25)	1 (2.08)	4 (4.17)
Postpartum fever	4 (8.33)	6 (12.50)	10 (10.42)
Anemia	1 (2.08)	0 (0)	1 (1.04)
No complications	28 (50.33)	22 (45.83)	50 (52.08)
Grand Total	48 (100)	48 (100)	96 (100)

imposed due to the pandemic, which may have hindered their ability to access healthcare facilities. One mother reported undergoing a cesarean delivery due to a severe cough caused by a COVID-19 infection. This highlights the potential health complications that can arise from contracting the virus during pregnancy. Another mother mentioned experiencing severe stress likely attributable to the pandemic and its associated uncertainties.

Results of the behavior determinants:

Significance in this study was determined by a p-value threshold of less than 0.05. The comparison between doers and non-doers was based on the recurrence of significant results rather than their percentage. The analysis revealed that there were seven determinants found to be significant for postnatal care (PNC) utilization. The specific determinants identified as significant for each behavior are outlined below in Table 4.

1. Perceived Self-efficacy:

Ease of Attending PNC: Doers were 3.3 times more likely to mention that the availability of community health workers (CHWs) makes it easier for them to attend a postnatal consultation (p=0.004). Doers were 3.1 times more likely to mention that the approval of their husbands makes it easier for them to attend a postnatal consultation (p=0.007). Non-doers were 2.6 times more likely to mention that the availability of a nearby facility would make it easier for them to attend a postnatal consultation (p=0.022). Non-doers were 2.2 times more likely to mention that the availability of money and transportation would make it easier for them to attend a postnatal consultation (p=0.022).

Difficulty of Attending PNC: Doers were 3.5 times more likely to say that there were no difficulties for them to attend a postnatal consultation (p=0.008). Non-doers were 5.5 times more likely to say that the distance of the facility makes it difficult for them to attend a postnatal consultation (p=0.001). Non-doers were 4.1 times more likely to say that social norms and traditions that prevent women from leaving home after childbirth make it difficult for them to attend a postnatal consultation (p=0.025). Non-doers were 3.9 times more likely to say that the unavailability of transportation makes it difficult for them to attend a postnatal consultation (p=0.011).

2. Perceived Positive Consequences:

Advantages of Attending PNC: Doers were 2.2 times more likely to say that ensuring their health and the health of their children are advantages of attending a postnatal consultation (p=0.023). No significant results among the non-doers

Table 4: The significant determinants of utilization of postnatal care:

Determinant	Sub-Factor	Odds Ratio	p-value	Association - More likelihood
1. Perceived Self-efficacy				
1.1 Ease of Attendance PNC	Availability of CHWs	7.82	0.004	Doers: 3.3x
	Husband's approval	6.96	0.007	Doers: 3.1x
	Nearby facility	0.31	0.022	Non-doers: 2.6x
	Money and transportation availability	0.36	0.022	Non-doers: 2.2x
1.2 Difficulty Attending PNC	No difficulties	11.00	0.008	Doers: 3.5x
	Facility distance	0.13	0.001	Non-doers: 5.5x
	Social Norms and traditions	0.19	0.025	Non-doers: 4.1x
	Transportation unavailability	0.20	0.011	Non-doers: 3.9x
2. Perceived Positive Consequences				
2.2 Advantages of Attending PNC	Health benefits	2.70	0.023	Doers: 2.2x
3. Perceived Negative Consequences				
3.1 Disadvantages of Attending PNC	No disadvantages	5.33	0.002	Doers: 3x
	Overcrowding and fear of COVID-19	0.40	0.029	Non-doers: 2x
4. Social norms				
4.1 Acceptance of Attending PNC	Husband's approval	4.05	0.001	Doers: 2.8x
	Husband's disapproval	0.27	0.026	Non-doers: 2.9x
	Mother-in-law's disapproval	0.44	0.045	Non-doers: 1.8x
5. Perceived Access				
5.1 Difficulty Accessing Health Centers	Difficulties in accessing	0.33	0.009	Non-doers: 2.4x
6. Perceived Susceptibility / Perceived Risk				
6.1 Likelihood of Experiencing Postnatal Problems	High likelihood of problems	5.09	0.000	Doers: 3.2x
	Somewhat of a likelihood of problems	0.42	0.041	Non-doers: 1.9x
	No likelihood of problems	0.27	0.026	Non-doers: 2.9x
7. Universal motivators				
7.1 Perceptions and Suggestions to Improve Access to PNC	Extended stay in the health facility	8.11	0.029	Doers: 3.1x
	Transportation availability	0.27	0.026	Non-doers: 2.9x

3. Negative Consequences:

Disadvantages of Attending PNC: Doers were 3 times more likely to say that there were no disadvantages of attending a postnatal consultation (p=0.002). Non-doers were 2 times more likely to say that overcrowding and fear of COVID-19 infection are disadvantages for them to attend a postnatal consultation (p=0.029).

4. Social norms:

Acceptance of Attending PNC: Doers were 2.8 times more likely to say that their husbands approved of them attending a postnatal consultation (p=0.001). Non-doers were 2.9 times more likely to say that their husbands disapproved of them attending a postnatal consultation (p=0.026). Non-doers were 1.8 times more likely to say that their mothers-in-law disapproved of them attending a postnatal consultation (p=0.045).

5. Perceived Access:

The Difficulty Accessing Health Centers: non-doers were 2.4 times more likely to say that it was very difficult for them to attend a postnatal consultation due to transportation, accompanying people, privacy, time, etc. (p=0.009).

6. Perceived Susceptibility / Perceived Risk:

Likelihood of Experiencing Postnatal Problems: Doers were 3.2 times more likely to say that they are very likely to experience problems immediately after their next delivery (p=0.000). Non-doers were 1.9 times more likely to say that they are somewhat likely to experience problems immediately after their next delivery (p=0.041). Non-doers were 2.9 times more likely to say that they are not likely at all to experience problems immediately after their next delivery (p=0.026).

7. Universal motivators:

Perceptions and Suggestions to Improve Access to PNC: Doers were 3.1 times more likely to say that if the woman stays in the health facility for 48 hours after giving birth, it will improve access to postnatal care services (p=0.029). Non-doers were 2.9 times more likely to say that the availability of transportation will improve access to postnatal care services (p=0.026).

Discussion

The study aimed to explore the barriers and determinants influencing the attendance of postnatal consultations within 24 hours after giving birth in the context of NW Syria. The findings shed light on the factors that influence the behavior of mothers in accessing postnatal care and provide insights for targeted interventions to improve utilization rates.

The sociodemographic information of the participants in the study provided valuable insights into the characteristics of the interviewed mothers. The findings revealed a significant proportion of adolescent mothers, with 15.6% of the sample being under 18 years old. Based on pre-crisis data from Syria, it is estimated that approximately 51.3% of young girls were married before reaching the age of 18 years.[10] This highlighted the presence of a vulnerable group of young mothers who may have required specific support and tailored healthcare services.

In terms of residency status, the data showed a diverse range among the respondents. Approximately 53.3% of the mothers were identified as internally displaced people (IDPs), indicating that they had been forced to leave their original homes due to conflict or other circumstances. This suggested that a substantial portion of the sample had experienced displacement and may have faced additional challenges in accessing healthcare services, according to WHO, it was found that 85% of displaced women of the Democratic Republic of the Congo with recent pregnancies reported experiencing one or more complications during delivery.[11] This high prevalence of complications highlights the vulnerability and specific challenges faced by displaced women in accessing adequate maternal healthcare services. On the other hand, 44.4% of the mothers belonged to host communities (HCs), representing individuals residing in areas not directly affected by displacement. However, the influx of IDPs over 12 years of conflict had added pressure on the already overwhelmed healthcare system, exacerbating accessibility issues and straining limited resources. The presence of returnees, accounting for 2.2% of the sample, indicated that some mothers had previously been displaced but had recently returned to their original homes. These findings highlighted the diverse backgrounds and experiences of the surveyed mothers, which may have had implications for their access to and utilization of healthcare services.

The level of education among the surveyed mothers is an important aspect to consider. The majority of the respondents had completed primary school education, representing 35.6% of the sample. Additionally, 32.2% had completed intermediate school, while 18.9% were found to be illiterate. A smaller percentage of the surveyed mothers had achieved higher levels of education, with 6.7% having completed high school and another 6.7% holding university or institute certificates. These results indicate that a significant portion of the surveyed mothers had limited formal education, with the majority having completed only primary or intermediate levels. Neonatal danger signs were significantly predicted by maternal age of less than 20 years and a maternal education level lower than secondary school.[12] A comparable study conducted in rural India found that uneducated women had low rates of full antenatal care utilization at 7% and postnatal care utilization at 24%.[13] This suggests that there may be

challenges in terms of their understanding of healthcare information and their ability to make informed decisions regarding postnatal care. Efforts should be made to provide accessible and culturally sensitive health education to ensure that mothers with lower levels of education can effectively engage with and benefit from postnatal care services.

Considering the sociodemographic characteristics of the participants in the study, it is evident that there is a diverse range of mothers with varying backgrounds and experiences. This underscores the importance of adopting a context-specific approach to postnatal care, taking into account the unique needs and challenges faced by different subgroups of mothers. Targeted interventions and tailored support programs can contribute to improving maternal health outcomes and promoting equitable access to postnatal care services in the studied population.

The findings of the study indicated that the majority of mothers (68%) chose to give birth in healthcare settings, emphasizing the importance of accessing professional care during childbirth. However, a small percentage (12%) of mothers opted for home deliveries, which may have carried potential risks. These figures are slightly similar to the finding of study findings conducted in another region of Syria, titled "Syrian Women's Preferences for Birth Attendant and Birth Place",[14] the results indicate that our study reported slightly higher figures for the rate of cesarean section. In the other study, it was found that the cesarean section rate was (13.6 %), whereas, in our study, it was (20 %). Additionally, the study reported a higher percentage of women giving birth at home (20.4 %) compared to our study (12 %). The study further explored the reasons behind home births, identifying factors such as long distance to health facilities, absence of transportation, social norms, and cultural factors, sudden occurrence of birth at home, husband refusal, and fear of COVID-19 infection. These findings shed light on the various factors influencing the decision to have a home birth, with accessibility, transportation, cultural norms, and concerns about the pandemic being prominent considerations. Similar reasons were identified as factors influencing the non-utilization of maternal health services in general and postnatal care in particular among Syrian refugees in Jordan.[10]

The study revealed that bleeding and postpartum fever were the most prevalent complications after delivery, representing 20.84% of all reported cases. Non-doers had a higher incidence of bleeding (60%) compared to doers (40%). Additionally, other complications such as back and stomach pain, uterine contractions, and various other complications were reported. These findings underscore the occurrence of diverse post-delivery complications, with bleeding and postpartum fever being the most frequently encountered. It is worth noting that non-doers experienced a higher frequency of complications overall. Poor utilization of postnatal care (PNC) services was found to be associated with maternal complications during delivery.[12]

The findings provided valuable insights into the factors influencing the behavior of mothers in NW Syria, distinguishing between DOERS (those who attended the consultations) and NON-DOERS (those who did not attend). In this challenging context, the results highlight the critical importance of addressing specific barriers to postnatal care utilization. For doers, community health workers and spousal approval emerged as significant factors. Given the disruption and strain on the health system in NW Syria, the presence of community health workers can be instrumental in facilitating access to postnatal care by providing information, guidance, and support to mothers. These findings align with a study conducted in eastern Uganda,[15] which found that the involvement of CHWs positively influenced postnatal care utilization. Community health worker (CHW) programs have been used for decades to improve access to health services in rural settings in low- and middle-income countries.[16]

Additionally, the approval and support of spouses, despite the challenging circumstances, play a vital role in a mother's decision to attend postnatal consultations.

On the other hand, non-doers faced various barriers to attending postnatal consultations. The availability of nearby facilities, financial resources, and transportation were identified as crucial factors. Lack of access to nearby facilities can create logistical challenges for mothers, particularly those living in remote areas. Financial constraints and transportation limitations further compound the difficulties faced by non-doers in accessing postnatal care services. Non-doers also mentioned distance, social norms, and lack of transportation as additional barriers to attendance. The distance between their homes and healthcare facilities can deter non-doers from seeking postnatal care. This is consistent with a study conducted in Syria[17] where distance and financial constraints were identified as barriers to postnatal care utilization. A study from Pakistan showed slightly similar barriers.[18]

Social norms and traditions that restrict women's mobility after childbirth may also prevent them from accessing healthcare services. To motivate mothers to attend postnatal consultations, it is important to emphasize the advantages of postnatal care for both the mother's health and the well-being of their children. A similar study from Ethiopia showed that the awareness of postpartum maternal health care services was found to be associated with prior visits by community health agents.[19] While Comparable studies conducted in India demonstrate that mothers who attended antenatal care had a higher awareness rate (64.4%) compared to women who did not receive antenatal care (33.3%).[19,20]

Clear communication about the benefits and necessity of postnatal care can help dispel any misconceptions or concerns held by non-doers. Moreover, addressing specific concerns related to overcrowding and fears of COVID-19 infection can alleviate anxieties and encourage attendance. The involvement of husbands and mothers-in-law emerged as influential factors in determining postnatal care utilization. Traditional beliefs, cultural practices, and religious customs surrounding the care of postpartum women and their newborn babies are deeply rooted, and they can have a negative impact on the utilization of postnatal services.[21, 22] Engaging these family members in educational campaigns and interventions can help garner their support and create a supportive environment for mothers to seek postnatal care.

Improving access to postnatal care requires addressing the identified barriers, such as transportation issues, privacy concerns, and scheduling conflicts. Implementing strategies to ensure reliable and affordable transportation options, maintaining privacy in healthcare facilities, and offering flexible scheduling arrangements can enhance the accessibility of postnatal care services. Lastly, clarifying the risks and complications associated with inadequate postnatal care is crucial. Raising awareness about the potential health consequences of not attending postnatal consultations can help individuals make informed decisions and prioritize their postpartum health. Insufficient health literacy and limited awareness of the importance of postnatal care were identified as key barriers hindering access to postnatal consultations, among a range of other factors as indicated in a study from Indonesia.[23]

Limitations

Limited geographical scope, it is important to note that the findings of this study are specific to the context of NW Syria and may not be directly generalizable to other regions or countries. However, they provide valuable insights into the unique challenges faced by mothers in a conflict-affected setting and offer potential strategies for improving postnatal care utilization. Future research should further explore the impact of the conflict on the health system in NW Syria and its implications for maternal and child health services.

Small sample size, which can impact the generalizability of the results, The findings may not accurately represent the broader population, and there may be challenges in detecting significant associations or relationships between variables.

Conclusion

In conclusion, the findings of this study shed light on the barriers and determinants that impact the attendance of postnatal consultations in Northwestern Syria. The results emphasize the significance of considering contextual factors, including the influence of the ongoing conflict on the healthcare system and the role of sociocultural norms. These findings underline the need to develop targeted interventions that address these factors to enhance the utilization of postnatal care services. By identifying the specific factors that influence both doers and non-doers, strategies can be formulated to improve postnatal care attendance. This may include interventions that address health literacy gaps and increase awareness about the importance of postnatal care among women and their families. Additionally, efforts should be made to address the challenges posed by the conflict and sociocultural norms. Ultimately, the implementation of effective interventions to improve postnatal care attendance has the potential to positively impact maternal and child health outcomes in the region. By addressing the barriers and determinants identified in this study, healthcare systems can work towards enhancing access to quality postnatal care services, leading to improved health outcomes for women and their newborns in Northwestern Syria.

Declarations

Ethics approval and consent to participate:
Participants were assigned codes that were used throughout the data collection and management process to maintain congeniality. Idlib and Aleppo Health directorates approved this study before the initiation of any study procedures. All participants gave informed consent before any study procedures.

Competing interests

There are no competing interests

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Figures 3-7. Questionnaire used in the study

Group : ❑ Doer ❑ Non-Doer

Barrier Analysis Questionnaire :
Attendance at Postnatal consultation
for use with women of children <6 months old

Behavior Statement
Mothers of newborns attend a postnatal consultation within 48 hours/2 days hours after delivery

Demographic Data

Interviewer's Name: _____Questionnaire No.: _____Date: ___/___/___

Community: _____

Age in years _____

Residency status: ❑Host communities ❑ Internally displaced people ❑ Returnees

Scripted Introduction:
Hi, my name is_____; and I am part of a study team looking into maternal and infant health. The study includes a discussion of this issue and will take about 20 minutes. I would like to hear your views on this topic. Before we begin, however, I would like to know the age of your youngest child?
You are not obliged to participate in the study and no services will be withheld if you decide not to. Likewise, if you chose to be interviewed you will not receive any gifts, special services or remuneration. Everything we discuss will be held in strict confidence and will not be shared with anyone else.
Would you like to participate in the study? [If not, thank them for their time.]

Section A - SRH Screening Questions

1. How did you give birth? → ❑ A. Vaginally or ❑ B. cesarean section
2. For normal deliveries, did it take place in? → ❑ A. health facility or ❑ B. at home→If at home, why? Open question
3. Have you experienced any complications during giving birth? → Open question "please explain".
4. Do you think that COVID-19 has impacted you negatively? → ❑ A. Yes or ❑ B. No.
5. If yes, please explain how? → ❑ A. Limited access to health services. ❑ B. Moving restrictions. ❑ C. other please specify.
6. Is there anything that refrain you from visiting the health facility? "COVID-19" or any other reason? ❑ A. Yes or ❑ B. No.
   If please elaborate more.
7. **What level of education did you complete?**
   ❑ a. Completed primary
   ❑ b. intermediate
   ❑ c. Completed secondary

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❑ d. Completed University/Institute
❑ e. Other

Section A - Doer/Non-doer Screening Questions

1. Do you have a child under 6 months old?
❑ A. Yes
❑ B. No → *End interview and look for another respondent*
❑ C. Don't Know /won't say → *End interview and look for another respondent*

2. After you gave birth to your last child, did you have a postnatal consultation – by this I mean a consultation just after you gave birth?
❑ A. Yes
❑ B. No → *Mark as Non-Doer and proceed to Section B*
❑ C. Do not know / no response → *End interview and look for another respondent*

3. Where did you go for your postnatal consultation?
❑ A. private or public health facility, maternity, clinic, or hospital
❑ B. any other place mentioned → *Mark as Non-Doer and proceed to Section B*
❑ C. Do not know / no response → *End interview and look for another respondent*

4. How soon after the birth did you have this consultation?
❑ A. within 48 hours/2 days
❑ B. more than 2 days after the birth → *Mark as Non-Doer and proceed to Section B*
❑ C. Can't remember / no response → *End interview and look for another respondent*

DOER /NON-DOER CLASSIFICATION TABLE

DOER (all of the following)	**Non-Doer** (any ONE of the following)	**Do Not Interview** (any ONE of the following)
Question 1 = A		Question 1 = B or C
Question 2 = A	Question 2 = B	Question 2 = C
Question 3 = A	Question 3 = B	Question 3 = C
Question 4 = A	Question 4 = B	Question 4 = C

Group: ❑ Doer ❑ Non-doer

Behavior Explanation
In the following questions I'm going to be talking about postnatal consultations. When I say this, I mean the consultation at a health facility that takes place very soon after the delivery to check the health of the new mother and the newborn.

Section B – Research Questions

(Perceived Self-efficacy)

1a. ***Doers***: What makes it ***easier*** for you to attend a postnatal consultation within 2 days after giving birth?

1b. ***Non-doers***: What would make it ***easier*** for you to attend a postnatal consultation within 2 days after giving birth??

(Write all responses below. Probe with "What else?")

(Perceived Self-efficacy)

2a. ***Doers***: What makes it ***difficult*** for you to attend a postnatal consultation within 2 days after giving birth?

2b. ***Non-doers***: What would make it ***difficult*** for you to attend a postnatal consultation within 2 days after giving birth??

(Write all responses below. Probe with "What else?")

(Perceived Positive Consequences)

3a. ***Doers:*** What are the ***advantages*** of attending a postnatal consultation within 2 days after giving birth?

3b. ***Non-doers:*** What would be the ***advantages*** of attending a postnatal consultation within 2 days after giving birth?

(Write all responses below. Probe with "What else?")

(Perceived Negative Consequences)

4a. ***Doers:*** What are the ***disadvantages*** of attending a postnatal consultation within 2 days after giving birth?

4b. ***Non-doers:*** What would be the ***disadvantages*** of attending a postnatal consultation within 2 days after giving birth?

(Write all responses below. Probe with "What else?")

(Perceived Social Norms)

5a. ***Doers:*** Who are the people that ***approve*** of you attending a postnatal consultation within 2 days after giving birth?

5b. ***Non-doers:*** Who are the people that ***would approve*** of you attending a postnatal consultation within 2 days after giving birth?

(Write all responses below. Probe with "Who else?")

(Perceived Social Norms)

6a. ***Doers:*** Who are the people that ***disapprove*** of you attending a postnatal consultation within 2 days after giving birth?

6b. ***Non-doers:*** Who are the people that ***would disapprove*** of you attending a postnatal consultation within 2 days after giving birth?

(Write all responses below. Probe with "Who else?")

(Perceived Access)

7a. ***Doers:*** How difficult "transportation, accompanying people, privacy, time, …. etc." was it to get the health center for a postnatal consultation within 2 days after the birth? Would you say it's very difficult, somewhat difficult or not difficult at all?

7b. ***Non-doers:*** How difficult "transportation, accompanying people, privacy, time, …. etc." would it have been to get the health center for a postnatal consultation within 2 days after giving birth? Would you say it's very difficult, somewhat difficult or not difficult at all?

- ❑ a. Very difficult
- ❑ b. Somewhat difficult
- ❑ c. Not difficult at all

(Perceived Cues for Action / Reminders)

8a. ***Doers:*** How difficult was it to remember to attend a postnatal consultation within 2 days after giving birth? Very difficult, somewhat difficult, or not difficult at all?

8b. ***Non-doers:*** How difficult do you think it would have been to remember to attend a postnatal consultation within 2 days after giving birth? Very difficult, somewhat difficult, or not difficult at all?

- ❑ a. Very difficult
- ❑ b. Somewhat difficult
- ❑ c. Not difficult at all.

(Perceived Susceptibility / Perceived Risk)

9. ***Doers and Non-doers:*** How likely is it that you will experience problems immediately after your next delivery? Would you say it's very likely, somewhat likely or not likely at all?

- ❑ a. Very likely
- ❑ b. Somewhat likely
- ❑ c. Not likely at all

(Perceived Severity)

10. **Doers and Non-doers:** How serious would it be if you experienced problems immediately after your delivery? Would you say it's very serious, somewhat serious, or not serious at all?
    - ❑ a. Very serious
    - ❑ b. Somewhat serious
    - ❑ c. Not serious at all

(Action Efficacy)

11. **Doers and Non-doers:** How likely is it that you would experience problems immediately after your delivery, if you attended a postnatal consultation within 2 days after giving birth? Would you say it's very likely, somewhat likely or not likely at all?
    - ❑ a. Very likely
    - ❑ b. Somewhat likely
    - ❑ c. Not likely at all

(Policy)

12. ***Doers and Non-doers*:** Are there any community laws or rules in place that make it more likely that new mothers attend a postnatal consultation within 2 days after delivery?
    - ❑ a. Yes
    - ❑ b. Maybe
    - ❑ c. No

(Culture)

13. **Doers and Non-doers:** Are there any cultural rules or taboos against mothers attending a postnatal consultation within 2 days after giving birth?
    - ❑ a. Yes
    - ❑ b. Maybe
    - ❑ c. No

Now I am going to ask you a question totally unrelated to the topic we've been discussing.

(Question on Universal Motivators)

14. **Doers and Non-doers:** What are your perceptions or suggestions to improve the access of postnatal care services?

THANK THE RESPONDENT FOR HER TIME!

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