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RESEARCH ARTICLE

PREVALENCE AND FACTORS AFFECTING THE UTILIZATION OF ANTENATAL CARE IN SANA'A CITY, YEMEN

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Abstract

Background and objective: Antenatal care (ANC) is a health care intervention designed to ensure the safety of pregnancy for the mother and fetus. This system recommends a minimum of four preconception care visits for a healthy pregnancy, according to the World Health Organization. It is not known whether this recommended number of visits was followed or not in urban or rural areas of Yemen. Therefore, the study aimed to investigate the prevalence and factors associated with the ANC utilization by pregnant women in Sana'a city, Yemen.
Methods: This study is an Institutional based cross-sectional descriptive study of married pregnant women practices toward ANC services**.** The sample size was calculated by Epi-Info to be 452 participants; multistage sampling was adopted. Data were collected from direct interviews using a structured questionnaire with closed-ended questions filled in by the investigators. A local language questionnaire was used. The questionnaire consists of several parts (Demographic characteristics, obstetric history, and practices and utilization of ANC) at 10-Health centers of Sana'a city, Republic of Yemen. Epi-Info was used for data analysis, χ^2 was calculated and p value < 0.05 was considered as a cut off for significance of deference.
Results: The response rate was 99.1%. Only 214 (47.3%) of the respondents have adequate utilization of ANC. Adequate ANC utilization was high in educated mother, educated husband, with high moderate income, and mothers with children >5. According to obstetric factors, adequate ANC utilization was high in mothers whose age at first pregnancy was more than 20 years, primigravida and primipara.
Conclusions: The results of the study draw attention to the need to levitate the number of ANC visits, and the significance of using an suitable model to ascertain the important socio-demographic factors that ANC service providers shall focus on to improve the health of the unborn baby and the mother during pregnancy.
Keywords: Maternal and child health (MCH), Sana'a city, utilization of antenatal care services.

INTRODUCTION

Globally, approximately 830 women died daily in 2015 due to many reasons, among them, pregnancy and complications during childbirth clearly linked to poor health care. Inadequate antenatal care (ANC) is a global public health challenge, especially in developing countries. Unfortunately, these deaths could be prevented one way or another if there was access to health facilities[1]. About 99% of maternal deaths occur in poor areas and are preventable. Similarly, about 2.6 million babies were stillborn in 2015, mainly in poor areas[1]. Hence, the risk of a woman in a developing country dying from a maternal-related cause during her lifetime is about 33 times higher than in a developed country. This is imperative as countries in developing

world account for 97% of the world population growth, rising from 7.0 billion in 2011 to 7.04 billion in mid-2012[1,2]. Yemen is among the 10 countries in the region with the highest child, neonatal and maternal mortality rates[3]. Yemen is considered to be the poorest country in the Arab World, with a per capita gross domestic product (GDP) of US$1.160, for a population of over 24 million. Moreover, Yemen has high population growth, low economic growth, and limited natural resources, with a high shortage of water[4].

In Yemen, the maternal mortality rate due to complications in pregnancy and childbirth was 385 per 100 000 live births in 2015. However, most of these deaths were avoidable, if there had been careful planning, and sufficient preparation and care during pregnancy, childbirth and immediately after delivery. These measures help to reduce maternal and newborn morbidity and mortality[1]. In addition to existing geographic, socioeconomic, and demographic difficulties, the current crisis in Yemen has aggravated the weak implementation coverage of essential interventions, in spite of the efforts of authorities, partners, and civil society[3].

There were no studies to investigate the prevalence and factors associated with ANC utilization by pregnant women in Sana'a city, Yemen. However, there are a limited number of studies on maternal and child health[5-21]. Therefore, there is a need to understand and clarify the factors that act as barriers to the effective use of the ANC among women within the framework of the scheduled visits in Sana'a city, Yemen. This study will produce data on the use of the ANC program in Yemen. This will provide background information for further studies related to ANC. The recommendations will assist in the future redesign of health education interventions in Yemen and developing countries.

MATERIALS AND METHODS

Study design: A health facility- based cross-sectional study was conducted**.**

Study area: The study was conducted in the health facilities of Sana'a City; the capital of the Republic of Yemen. Administratively the city is divided into 10 districts, 9 of them are urban while one is rural. According to the Central Statistical Organization (CSO) Population projection for 2015, the estimated total population of Sana'a capital city is 1,957,000 (population estimate for 2015). Notable, the ongoing conflict has resulted in a more Internally Displaced Population IDP coming to Sana'a from hotspots governorates[4].

Study period: The study was conducted from February 2018 to August 2018.

Study population: Women of reproductive age (15-49 years) attending health centers.

Inclusion criteria: Women, who are resident in Sana'a city (resident for more than one year in Sana'a city), and last pregnancy not more than 5-years.

Exclusion criteria: Women who are resident for less than one year in Sana'a city and have last pregnancy of more than 5 years.

Sampling technique

Sample size: The sample size was calculated using Epi info version 7 and based on the following assumption: The total number of married women in Sana'a city (Population size) is 378.664[4]. The percentage of women who used ANC is 60%[4], the accepted margin of error=5%, design effect=1, and the confidence level= 97%, the calculated sample size is 452.

Sampling method

Multistage sample technique*:* The sample was selected from public health centre (Total number=64 health centre)[4]. The number of fully functioning centres is 45 and partially functioning is 11 health centre[4].

The multistage random sampling method was used to select the study sample and to obtain nationally representing sample.

Stage 1: The researcher depends on the administrative division of Sana'a capital city, as the total number in this city is 10 district.

Stage 2: Determining the total number of health centers in each district of the 10 districts.

Stage 3: Determining the number of health centers that will participate in the study from each district (from the 10 districts) then putting all functioning health centres for each district in separate list. One center was to participate from each district.

Stage 4: Determining the name of the health center that participate in each district by a random method as reflected in the following shape: The city of Sana'a consists of the district of Azal, Al-Tahrir, Al-Thawra, Al-Safia, Al-Sabeen, Al-Wahda, Shu'ub, Old Sana'a, Ma'in, Bani Al-Harith. A health center from each district was randomly selected. The randomly selected centers are Al-Tawhid Center, Al-Shaheed Ali Abdul-Mughni Center, Al-Tabari Center, Al-Iraqi Center, Al-Zahrawi Center, Al-Alfi Center, Al-Shaab Center, Al-Raisi Center, Gaza Complex and Bit-Handel Center.

Stage 5: Determining the number of married women who participate in the study from each center of the 10 selected centers by dividing the sample size equally.

Study Tool: Structured questionnaire was the tool for data collection. The questionnaire was developed with emphasis on knowledge, attitude and utilization of ANC with factors affecting it to achieve the objective of the study. We benefited from previous similar surveys in Ethiopia and India[22,23].

Data collection technique: The data was collected by direct interviews using a structured questionnaire close-ended question. The local language of the questionnaire was used. The questionnaire consists of five parts (Sociodemographic characteristics, obstetric history, knowledge, attitude and practice). Sociodemographic characteristics namely age; parity, education, occupation, and socioeconomic status were selected for studying association with knowledge and practices regarding ANC.

Statistical analysis: Data was analyzed using chi-square for categorical variables (if more than 20% of the cells contain an expected value less than 5, fisher exact test was used), p-value < 0.05 was considered as a cut-off for significant deference here showed. Findings were represented using text, graphs and tables.

Ethical consideration: Ethical clearance was obtained from the Ethics Committee in the Ministry of Public Health and population before data collection. An official letter was obtained from the Yemeni Board for Medical Specialization Council to be submitted to the health centers administration to facilitate conducting this research work, Verbal consent was also obtained from each health facility and study participants. Similarly, the participants were informed about the purpose of the study. All information gained during data collection was kept confidential; anonymity was followed. No any personal identifiable information has appeared; all gathered information was stored in a pass worded computer. The subjects were respected and committed to ensuring the independence of the research participants, preventing their independence from being compromised, and protecting people from exploiting their vulnerability. The dignity of all research participants was respected. Adherence to this principle ensures that people are not used simply as a means to achieve research objectives. Participation in the study is completely voluntary, and each participant has the right to withdraw from the study at any time without any negative impact on the health services provided to them.

RESULTS

The mean age of the respondents is 31.2±7.56 years. Most of the participants (63.1%) are aged between 20-34 years old. 78.1% are literate. The majority of husbands are literate, (84.5%). The household income of the majority of participants (75%) is low (Table 1). Regarding, the obstetric characteristics of participants: the mean age of participants at first pregnancy was 19.05±3.66 years. More than half of participants (62.2%) were less than 20-years-old in their first pregnancy. Regarding gravida, 84% were multigravida, while 16% were primigravida. Concerning parity, only 20% of the participants were primipara and 80% were Multipara (Table 1).

Table 1: Percentages of ANC service utilization by women in 8 socio-demographic categories.

Categorical variable	No (%)	Adequate ANC visit N (%)	Inadequate ANC visit N (%)	*p*
Age of participants (mean=31.2±7.56 years)				
Less than 19	14 (3.1)	7(50)	7(50)	<0.001
20-34 years	285 (63.1)	168 (59)	117(41)	
35-49 years	153 (33.9)	39(25)	114 (75)	
Total results	452 (100)	214 (47.3)	238 (52.7)	
Education level				
	Education level of mothers			
Illiterate	144 (31.9)	25 (17.4)	119 (82.6)	<0.001
Literate	308 (78.1)	189 (61.4)	119 (38.60	
	Education level of husbands			
Illiterate	70 (15.5)	8 (11)	62 (88.6)	<0.001
Literate	382 (84.5)	206 (54)	119 (31.2)	
Family income				
Low	339 (75)	202 (46)	236 (54)	<0.001
Moderate and high	113 (25)	12(80)	3 (20)	
Number of children in groups				
1-5	160 (53.4)	65 (78.3)	18 (21.7)	<0.001
>5	292 (64.6)	149 (40.4)	220 (59.6)	
Age of 1st pregnancy				
20years<	281 (62.2)	79 (23)	161 (67)	<0.001
20–34 years	171 (37.8)	135 (64.7)	77 (36.3)	
Gravida				
Primi gravida	72 (16)	57 (79.1)	15 (20.9)	<0.001
Multi gravid	380 (84)	157 (41.3)	223 (58.7)	
Parity				
Primipara	90 (20)	61 (78.2)	17 (21.8)	<0.001
Multipara	362 (80)	153 (40.9)	221 (59.1)	

Regarding antenatal care utilization during the last pregnancy: among the respondents 238 (52.7%) had inadequate ANC. Regarding, the factors associated with ANC utilization**:** the study revealed a statistically significant difference (*p* values between <0.01 and 0.05) between the mother's education level, father education, age at first pregnancy, gravida and parity (Table 1). On the other hand, ways of transportation, cost, time spent from home to the health facility, and waiting time in the health facility till getting the service showed no statistical significance with adequate utilization of ANC ($p>0.05$).

However, the participants reported the statistical significance of transportation cost with adequate utilization of ANC ($p<0.05$), however, 68.1% of participants who reported that transportation cost was high showed poor ANC utilization as compared to 43.4% of participants who reported moderate or low transportation cost (Table 2).

Table 2: Accessibility to ANC and ANC utilization of women attending the health facility, Sana'a, 2018 (N=398), for transportation cost (N= 199).

Characteristics		Adequate ANC N (%)	Inadequate ANC N (%)	*p*
How did you get to health center in last pregnancy?	Walking Private care, Rented car or bus	76 (50) 138 (55.8)	76 (50) 107 (44.2)	>0.05*
How much did you pay for transportation going and coming to health facility?	100- 300 RY 400- 5000RY	50 (51.5) 51 (50)	47 (48.4) 51 (50)	>0.05*
How long did it take you to get the health facility?	0-20 minutes >=20 minutes	144 (55.3) 70 (50.3)	116 (44.6) 68 (49.6)	>0.05*
For how long did you wait to enter ANC clinic?	0-30 minutes >=30 minutes	84 (52.1) 130 (54.6)	77 (47.8) 107 (45.3)	>0.05*
Do you think that the cost of transportation was:	Low and Moderate cost High cost	86 (56.5) 15 (31.9)	66 (43.4) 32 (68.1)	< 0.01*

DISCUSSION

In this study, 52.7% of participants reported insufficient use of ANC. These results are lower than those reported in Libya (76.4%),[24], and Iraq (82.4%)[25], but a nearly similar rate has been reported in Ethiopia (50%)[26] and India (42.6%)[22] . Older maternal age in the current study was associated with inadequate utilization of ANC (75%) (p<0.001) (Table 1), and similar results have been reported in Ethiopia[26], in Malaysia[27], but differ from that has been reported in Kenya[28] where there is no significant relationship between age and ANC utilization. There was a significant association between illiterate mother and inadequate ANC use (75%, p<0.001) (Table 1). This result is consistent with studies in Bangladesh [29] and Nigeria[18] where the use of antenatal care was lower among mothers with no or less education, but differs from that reported in Rwanda where there was no significant association between school attendance/ literacy and low ANC use[30]. This study established a significant relationship between low household income and insufficient use of ANC (54%, p-value <0.001) (Table 1). This finding is consistent with studies in Nigeria[31] and Chhattisgarh State in India[32], which reported that affluent women were more likely to benefit from ANC services than their poor counterparts. However, a study in Rwanda found that ANC use had no significant association with household income[30]. This study showed an association between family size (children >5) and insufficient use of ANC (59.6%, p-value <0.001). This finding is similar to a study in India[33], but contrasts with a study in Ethiopia that reported that mothers living in families with fewer than three children were eight times more likely to use ANC than those living in a household with more than five[34].

A significant association was found between participants' age in their first pregnancy at <20 years and inadequate use of ANC (rate=67%, p<0.001). This means that women of different age groups differ in their behavior in seeking health services. This finding is consistent with a systematic review of factors influencing the use of ANC in developing countries. For example, Bibha Simkhada reported earlier that ANC utilization is closely related to women's age at marriage and pregnancy, as it is more likely that prenatal screenings were attended by women who married at age 19 or older compared to those who got married younger and got pregnant early[35]. This study showed that mothers of primigravida had more adequate use of ANC than multigravida (with insufficient rate of multigravida=58.7%, p<0.001). This may be because primigravida is more likely to seek advice and help and start ANC early given that they have experienced symptoms or signs of pregnancy. Another reasonable explanation for this is that women pregnant with their first child were more careful about their pregnancy and therefore used ANC more often. This finding is consistent with a study in Kenya that showed that women at particular risk of delaying ANC visits were older multiparous women[28]. Similarly, a study in Oman showed that after adjusting for other factors in pregnancy, pregnancy with the first child was the only relevant indicator of the overall adequacy of the ANA use (odds ratio 2.2; 95% CI: 1.6–3.2)[36]. This study found that participants with inadequate utilization of ANC were multiparous (inadequate ANC rate=59.1%, p<0.001). This finding is consistent with studies in Cameron[37], rural India[38], Pakistan[39], which reported that the majority of women giving birth in first-degree use fully ANC. Although some studies conducted in Nigeria[31] showed no significant association between the parity of the respondents under study and their attendance/utilization of ANC services.

This study showed that over one-third of participants who adhere to ANC walk on foot to get to health facilities (Table 2). The majority of participants who followed ANC spent less than half hour from home to a health facility where ANC service was available. The median cost of travelling was 300 Rails. This finding is similar to studies conducted in Ethiopia[40]. Nonetheless, ways and cost of transportation, time spent from home to health facilities, and waiting time in the health facility showed no statistically significance with adequate utilization of ANC (p-value of > 0.05). This finding contradicts many studies conducted in Japan[41], South Africa[42,43] which reported that the perceived barriers to ANC utilization were issues related to access to health facilities and lack of resources. The main disparity between this research and previous studies is that majority of mothers in Sana'a city spent

less than half-hour from home to health facility, while more than one-third did not need to take transportation to reach health facilities for ANC.

Limitation of the study

Health efficiency in Yemen has not been studied as a deterrent or encouraging factor for the use of maternity centers has not been studied. Also, women's awareness of pregnancy, complications, symptoms and main causes of bad pregnancy has not been studied and investigated. Furthermore, public health interventions such as health education and community education that can reduce women's visits to the ANC, particularly to rural residents, have not been studied.

CONCLUSIONS

This study documented several socio-economic and cultural factors affecting the utilization of antenatal care services among women in Sana'a city. Adequate ANC utilization was found to be high in educated mothers, educated husbands, high and moderate-income, and mothers with family size less than 5 persons. As regards obstetric factors, adequate ANC utilization was high in mothers aged over 20 years at their first pregnancy, primigravida, and primipara. On the other hand, no statistical significance was found between ANC utilization and satisfaction, decision making for ANC visits, and ways, waiting for time and cost of transportation. The study outcomes emphasize the need to levitate the number of ANC visits, and the significance of by means of an appropriate model to ascertain the essential socio-demographic factors that ANC service suppliers shall focus on to progress the health of the unborn baby and the mother during pregnancy.

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AUTHOR'S CONTRIBUTION

Alqadi SA: writing original draft, designed the study, literature searches. **Mutahar DJA:** statistical analysis, formal analysis. **Al-Moyed KAA:** conceptualization, methodology. **Assabri AM:** editing, methodology. **Al-Shamahy HA:** methodology, supervision. **Al-Ankoshy AAM:** conceptualization, methodology. **Al-Hadad AM:** formal analysis. All Authors read and approved the manuscript.

DATA AVAILABILITY

The datasets generated during this study are available from the corresponding author upon reasonable request.

CONFLICT OF INTEREST

None to declare.

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