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Original Research Article

Knowledge and attitude regarding periodontal disease leading to adverse pregnancy outcomes among accredited social health activist workers in Davanagere Taluk: a cross-sectional survey

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ABSTRACT

Background: Periodontal disease is linked to adverse pregnancy outcomes. A study was done to assess knowledge and attitude regarding periodontal disease leading to adverse pregnancy outcomes among Accredited Social Health Activist (ASHA) workers in Davanagere Taluk.
Methods: A cross-sectional survey was done involving 280 ASHA workers of Davanagere taluk in a field setting. Data regarding demographic details and knowledge and attitude related to periodontal disease leading to adverse pregnancy outcomes was collected from research participants using a questionnaire which was tested for validity and reliability. Responses were presented in percentages and Pearson's correlation test was used for data analysis.
Results: Majority of ASHA workers (50-54%) felt that pregnancy and its outcomes were not related to gum disease and 15-20% of them did not know about it. Around 75-88% felt that pregnancy related outcomes like preterm birth, low birthweight baby, gestational diabetes were not linked to periodontal disease. Very few felt (11-21%) that gum disease was linked to adverse pregnancy outcomes. There was no significant correlation ($p>0.05$) between knowledge scores and age, educational level and years of work experience of ASHA workers.
Conclusions: Knowledge and attitude regarding periodontal disease leading to adverse pregnancy outcomes among Accredited Social Health Activist workers in Davanagere Taluk was poor.

Keywords: Accredited social health activist, Primary health care, Periodontal disease, Pregnancy, India

INTRODUCTION

Pregnancy brings about various physical and hormonal changes that affect almost every organ system, including the mouth. Periodontal infection is the most common oral problem associated with pregnancy.[1] Maternal periodontal disease has been linked with preterm birth, low birth weight or small for gestational age infant, preeclampsia, gestational diabetes and fetal loss.[2] Adverse pregnancy outcomes become an important concern because preterm birth and low birth weight are major causes of infant mortality. Two possible biological pathways suggesting the link between periodontal disease and adverse pregnancy outcomes are 1) the direct dissemination of the periodontal pathogens or their toxic by-products which reach the foetal-placental unit, and 2) an indirect mechanism when the circulating systemic inflammatory mediators induced by the periodontal inflammation can provoke secondary inflammation and foetal damage in the amnion.[3] Hence, periodontitis is now recognized as one of the modifiable risk factors for poor pregnancy outcomes. Complicated pregnancies are also linked to the offspring facing various lifelong problems, such as respiratory failure, impaired motor skills,

cognitive and intellectual disability, learning disabilities, and cardiovascular and metabolic disorders, in addition to an increased risk of fetal/neonatal mortality and morbidity.[4] As a result, unfavorable pregnancy outcomes are a significant public health problem. What must be recognized, though, is the critical role of community health care workers in this entire situation. Dental and community health workers should consider oral health care as an important part of overall prenatal care in order to offer appropriate and standard prenatal care thereby preventing adverse pregnancy outcomes.

Accredited Social Health Activist (ASHA) is a community health worker under NRHM (National Rural Health Mission) scheme appointed for every village with a population of 1000 to carry out health promotional activities like universal immunization, referral and escort services for reproductive and child health (RCH) and creating health awareness among women.[5] Pregnant woman in rural areas and backward communities are first seen by ASHA workers and they seek oral health care if oral health problems are recognized by ASHA workers and they refer them to dental professionals .As a result, it's crucial to determine ASHA workers understanding of periodontal disease and its implications on adverse pregnancy outcomes. Meanwhile, there is a scarcity of data on ASHA workers' understanding, and perceptions about oral health care during pregnancy and the impact of maternal oral health on pregnancy outcomes. Hence a cross-sectional study was planned to assess knowledge and attitude regarding periodontal disease leading to adverse pregnancy outcomes among Accredited Social Health Activist (ASHA) workers in Davanagere Taluk which could provide useful data for planning educational and training programs for ASHA workers to recognize the oral problems in pregnant women and encourage them to seek timely oral health care services towards prevention of adverse pregnancy outcomes related to periodontal disease.

METHODS

A descriptive, cross sectional questionnaire Survey was conducted among ASHA workers of Davanagere Taluk in a field setting. List of registered ASHA workers was obtained from registry available at office of District Health after obtaining permission from District Health Officer, Taluk Health Officer and Medical Officers at Primary health centres. Around 300 ASHA workers attached to 34 Primary Health Care centres of Davanagere taluk were invited to take part in the study. Purposive sampling was followed. One female health worker (Davanagere Taluk) was in-charge of 12 ASHA worker facilitators. Each facilitator was in-charge of three PHC'S and around 12 ASHA workers. So, the investigators first met the health workers, who lead the investigators to facilitators who further lead them to ASHA workers who provided the data. Around 280 out of 300 ASHA workers of Davanagere Taluk, voluntarily consented for participation in the study. Ethical approval was obtained from the Institutional Review Board of Bapuji Dental College and Hospital, Davangere. Voluntary written informed consent was obtained from the study participants after explaining them about the purpose of conducting the study and procedure of collecting the data through participant information form. Duration of study was from January 2022 to April 2022. All the ASHA workers of Davanagere taluk who consented to participate were included in the study. ASHA workers belonging to taluks other than Davanagere city were not involved in the study.

Data collection

A self-designed structured proforma containing both open and closed ended questions. The proforma was divided into five sections. It had the provision to record demographic characteristics like name, age, place of work, contact number, educational qualification, years of service and to record knowledge and attitude regarding periodontal disease leading to adverse pregnancy outcomes using questionnaire.

Questionnaire details

A questionnaire was framed consisting of 7 items under two domains namely knowledge and attitude. All the questions were closed ended except 5th and 7th question which was open ended with multiple choice response. Items 1,4,5,6 were knowledge related questions and Items 2,3,7 were attitude related questions.

Validation of the questionnaire

Language validity of the questionnaire was tested. As majority of the participants preferred Kannada questionnaire, for easier understanding and unbiased answers, the questionnaire was translated to Kannada and back translated to English by bilingual translators. Hence, language validity was established Content validity of the questionnaire was tested by five validators (one Public Health Dentist, one Periodontist, one ASHA worker, one Gynaecologist and one Oral Medicine Specialist). Items in the questionnaire was assessed for relevance, simplicity, clarity and ambiguity. The content validity index (CVI) of questionnaire was computed and validity was tested. According to Yaghmale F, the item with CVI score over 0.75 was recommended as acceptable CVI value.[6] A satisfactory level of agreement was found as reflected by every score for each item among the five experts, i.e., CVI score for relevance = 0.87, clarity = 0.84, simplicity = 0.92, and ambiguity = 0.94, respectively. These CVI values suggested that the questionnaire had a good content validity. Necessary modifications were done based on comments of the validators. Face validity of the questionnaire was determined by distributing the questionnaires to ASHA workers. A satisfactory level of agreement was found among participants regarding the clarity and

understandability of the questions and language of the questionnaire.

Details of pilot study

A pilot study was conducted to check the feasibility, reliability and internal consistency of questionnaire. The questionnaire was administered to 20 participants for pilot testing. After a period of three days the questionnaires were re – administered to the same participants to check the reliability by test - retest method. Cronbach's α (alpha) was 0.86 which reflected good reliability of questionnaire.

Method of data collection

Data was collected by distributing questionnaires to ASHA workers at their respective Primary Health Centre premises. The questionnaire was self-administered. Sufficient time was given to participants to answer the questionnaire. Maximum time of 20 minutes per participant was allowed to answer the questionnaire. Participants were not allowed to discuss among themselves during answering of questionnaires. After data collection, ASHA workers were educated regarding identification of periodontal disease, adverse pregnancy outcomes related to periodontitis and importance of referring pregnant women with periodontitis to dentist by the investigators.

Statistical analyses

The data obtained was compiled systematically in Microsoft Excel sheet and subjected to statistical analyses using IBM SPSS Statistics for Windows, version 21 (IBM Corp., Armonk, N.Y., USA. The significant level was fixed at $p \leq 0.05$. Descriptive statistics of the responses were generated in terms of frequencies and percentages. Pearson's correlation test was employed to test the correlation between knowledge and age, years of service and educational level of ASHA workers.

RESULTS

A total of 280 ASHA workers out of 300 registered ASHA workers of Davanagere Taluk participated in the study yielding a response rate of 93.33%. The mean age of participants was 38.86±4.87 years. Mean work experience was 7.95±2.95 years. Majority of them were 10th standard pass (68.7%), followed by Pre-university pass and graduates (22.5%). Few were educated till 7th standard (9.3%) (Table 1).

Around 25-35% ASHA workers felt that pregnancy and its outcomes were related to gum disease. Majority (50-54%) felt that pregnancy and its outcomes were not related to gum disease and 15-20% of them did not know about it (Table 2).

Table 1: Demographic characteristics of study participants.

Demographic variables	N (%)	Chi Square value (P value)
Age (years)		
20-30	5 (1.8)	164.10 (0.00)
31-40	180 (64.3)	
41-50	95 (33.90)	
Years of service		
1-5 years	76 (27.14)	227.20 (0.00)
6-10 years	130 (46.43)	
11-15 years	74 (26.43)	
Education		
Primary school	26 (9.3)	16.63 (0.00)
Higher primary	191 (68.2)	
Pre university and graduate	6 3(22.5)	

Table 2: Distribution of knowledge and attitude related responses of study participants.

Item no.	Response	N (%)
Do you feel that pregnancy is related to gum disease?	Yes	99 (35.4)
	No	139 (49.6)
	Don't Know	42 (15)
Do you feel pregnancy increases the likelihood of gum disease?	Yes	69 (24.6)
	No	152 (54.3)
	Don't know	59 (21.1)
Do you feel gum disease affects outcome of pregnancy?	Yes	82 (29.3)
	No	140 (50
	Don't know	58 (20.7)
Which of the following you feel is related to gum disease in pregnant women?		
Pre term birth	Yes	36 (12.9)
	No	244 (87.1)
Low birth weight baby	Yes	32 (11.4)
	No	248 (88.6)
Gestational diabetes	Yes	57 (20.4)

Continued.

Item no.	Response	N (%)
	No	223 (79.6)
Pre-eclampsia	Yes	59 (21.1)
	No	221 (78.9)
None of the above	Yes	69 (28.6)
	No	211 (75.4)
Don't know	Yes	43 (15.4)
	No	237 (84.6)
Which dental treatment do you think is safe during pregnancy?		
Cleaning of teeth	Yes	183 (65.4)
	No	97 (34.6)
Fillings	Yes	71 (25.4)
	No	209 (74.6)
Extraction	Yes	17 (6.1)
	No	263 (93.9)
Radiographs	Yes	30 (10.7)
	No	250 (89.3)
None of the above	Yes	30 (10.7)
	No	250 (89.3)
Don't know	Yes	14 (5)
	No	266 (95)
Which is the safest period for pregnant women to undergo dental treatment?		
First trimester	Yes	131 (46.8)
	No	149 (53.2)
Second trimester	Yes	64 (22.9)
	No	216 (77.1)
Third trimester	Yes	28 (10)
	No	252 (90)
None of the above	Yes	37 (13.2)
	No	243 (86.8)
Don't know	Yes	32 (11.4)
	No	248 (88.6)
If you come across pregnant ladies with gum problems whom do you refer them to?		
Dentist	Yes	205 (73.2)
	No	75 (26.8)
Medical doctor	Yes	74 (26.4)
	No	206 (73.6)
Do not refer	Yes	2 (0.7)
	No	278 (99.3)
Tell them to avoid dental treatment	Yes	0 (0)
	No	280 (100)

Table 3: Correlation between knowledge scores and age, educational level and work experience of ASHA workers.

Variables correlated	Age		Educational level		Years of work experience	
Knowledge score	**Pearson's correlation value**	**P value**	**Pearson's correlation value**	**P value**	**Pearson's correlation value**	**P value**
	-0.01	0.79	0.04	0.46	-0.002	0.96

Around 75-88% felt that pregnancy related outcomes like preterm birth, low birthweight baby, gestational diabetes were not linked to periodontal disease. Very few felt (11-21%) that gum disease was linked to adverse pregnancy outcomes. (Table 2). Majority felt that oral prophylaxis (teeth cleaning) was safe during pregnancy (65.4%). Very few perceived, dental restorations, extractions and radiographs to be safe during pregnancy (6-25%). Majority felt first trimester of pregnancy to be safe to undergo dental treatment (46.8%) followed by second

trimester (32.9%) and third (13.2%). Many (73.2%) expressed that they would refer pregnant women with dental problems to a dentist and medical doctor (26.4%) (Table 2). There was no significant correlation (P>0.05) between knowledge scores and age, educational level and years of work experience of ASHA workers. (Table 3) (correlation and p-values not mentioned in the table - table is incomplete). (Questionnaire completion rates not mentioned).

DISCUSSION

The results of the study indicate that the knowledge about periodontal disease leading to adverse pregnancy outcomes among ASHA workers of Davangere Taluk was poor. These results could not be compared with other studies as this was the first study which explored the ASHA workers' knowledge about periodontal disease related to adverse pregnancy outcomes. However, few studies indicated that the oral health related knowledge of ASHA workers was poor.[7-9] A study done by Hashim et al showed that the knowledge regarding periodontal disease leading to adverse pregnancy outcomes among Gynaecologists was good.[10] Periodontal diseases may have a negative impact on pregnancy outcomes due to the following hypothesised pathogenic processes. Firstly, following bacteraemia, periodontal bacteria originating in the gingival biofilm damage the feto-placental unit. Secondly, inflammatory mediators released by the subgingival inflammatory site travel to the feto-placental unit and trigger an inflammatory response.[11] Few systematic reviews have revealed adverse pregnancy outcomes like preterm birth, low birth weight, preeclampsia to be associated with periodontal disease.[12,13] Due to the possible hazards to the foetus linked with regularly prescribed medicines in dentistry and dental procedures, providing sufficient oral health care during pregnancy has long been a challenging task for dental health care workers. Pregnancy is no longer considered a contraindication to receiving appropriate dental care. Rather, implementing dental therapy throughout pregnancy will result in a healthier pregnancy related outcomes and a stress-free pregnancy for the expectant mother. Periodontal therapy is especially important during pregnancy, because hormonal changes make women more sensitive to plaque formation and gingival irritation.[13] To protect the mother and the developing foetus, any acute periodontal infection should be treated as quickly as possible. Many dental problems require the use of dental radiographs for diagnosis and treatment. According to few studies, taking essential intraoral and extraoral dental radiographs of pregnant women is safe and poses no risk to the growing foetus.[14,15] To safeguard the vulnerable organs, however, protective lead aprons and thyroid collars are recommended. Furthermore, the radiation dose should be reduced as much as possible while still producing a standard radiograph in order to reduce the pregnant patient's exposure to X-ray radiations.

Majority of ASHA workers, felt first trimester of pregnancy to be safe for pregnant women to undergo dental treatment. However, because of the physiological changes that occur during pregnancy, dental treatments and procedures must be modified and considered in order to protect the mother and foetus. Dental treatment can be safely administered during any of the three trimesters of pregnancy, but due to the morning sickness that most pregnant women experience during the first trimester and the high risk of postural hypotension during the third trimester, the second trimester of pregnancy is the best time to deliver efficient dental care.[14,15]

Knowledge related to periodontal disease leading to adverse pregnancy outcomes among ASHA workers was poor in the present study. This is of concern for dentists because it prevents them from giving the best possible care to pregnant patients. ASHA worker is the primary point of contact for any health-related needs of the poor, particularly women and children, who have difficulty accessing health care.[5] She is the fountainhead of community participation in public health programmes across rural areas in India. She is a health activist in the community who will create awareness on health and its social determinants and mobilizes the community and facilitates them in accessing health and health related services. Hence, it is crucial for ASHA workers to have knowledge related to periodontal disease leading to adverse pregnancy outcomes so that they can educate the pregnant women regarding the same thereby prevent adverse pregnancy outcomes and help the pregnant women receive necessary and timely oral health care. The backbone of ASHA workers' capacity building and functioning is training. Hence, oral health related training must be appropriately and effectively planned for them. Monthly meetings should be used to emphasise various aspects of periodontal disease in pregnancy, on a regular basis. More focus should be placed in training sessions on emergency dental treatments that require referral for dental care during pregnancy and a conceptual knowledge of periodontal disease leading to adverse pregnancy outcomes.

The results of the study could be best generalized to ASHA workers of Davanagere Taluk. However, the knowledge levels of ASHA workers could differ across different taluks. Information regarding training of ASHA workers related to oral health was not collected which could have provided more insights in planning future training programmes. The present study established a baseline data to plan awareness and training programs for ASHA workers to identify the oral health problems among pregnant women and refer them to dental care. Since it's a cross-sectional survey, the results of the study cannot be generalized to other populations. Some items in the questionnaire required recalling of events by the ASHA workers which might have led to memory and response bias. No item was framed to test the self-perceived knowledge about oral health of ASHA workers.

CONCLUSION

Knowledge regarding periodontal disease leading to adverse pregnancy outcomes among Accredited Social Health Activist (ASHA) workers in Davanagere Taluk was poor.

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