

Barriers to Adherence of Optimal Birth Spacing: A Qualitative Study Among Mothers and Their Husbands in Arba Minch Zuria district, Ethiopia

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Abstract

Background: Optimal birth spacing plays a critical role in promoting perinatal health. However, in Ethiopia, many women still have shorter birth intervals than they would prefer and studies done to assess knowledge of couples were scarce. The objective of this study therefore was to assess perceived knowledge of couples about the disadvantage of short birth intervals in Arba Minch Zuria district, Ethiopia. **Methods:** Qualitative study design was conducted from February to April 2014 among women having at least two consecutive live births. Purposive sampling was employed to select information rich participants. Data were collected through focus group discussions using a semi- structured flexible discussion guide. Sixteen FGDs were conducted involving a total of 128 participants. Data were entered in to open code software and analyzed thematically. **Result:** Perceived disadvantage of short birth spacing, ultimate decision maker about birth intervals and reasons for experiencing short birth spacing were the major themes emerged from the discussion. Perceived knowledge of focus group discussants about the disadvantages of short birth spacing was very high. Ultimate decision maker about birth spacing were couples in the optimal spacers groups. On the other hand, husbands had the right to say the final word among discussants that had short birth intervals. Index child being female, husband & religious influences, fear of side effects of contraceptive, lack of information about the benefit contraceptives, and inaccessibility of reproductive health services were noted as reasons to experience short birth spacing. **Conclusion:** Perceived knowledge of discussants was similarly high in both short and optimal birth spacers. The main reasons for experiencing short birth spacing were, husband influence, fear of side effects of contraceptives, lack of information about the benefits of contraceptives, and geographical inaccessibility of reproductive health care services. For women to achieve optimal birth spacing, they need the support of their significant family members. Hence, behavioral change communications should target all of those who have a direct or indirect influence on birth spacing decisions. Moreover, the district in collaboration with other stallholders needs to work hard to make reproductive health service accessible in all aspects.

Keywords: Perceived advantage, short birth interval, Qualitative study, Ethiopia

Introduction

Inter birth interval (IBI), which is defined as the duration of time between two consecutive live births, has critical effect on the health status of the mother and her child [1, 2]. Evidences showed that a relationship exists between shorter IBI and high infant and child mortality [3, 4]. It was also indicated to be linked with increased risk of preterm birth, low birth weight, small for gestational age (SGA), labor dystocia, maternal morbidity and mortality, premature rupture of membranes, third-trimester bleeding, anemia, and puerperal endometritis [5,6,4]. Beyond the health implications, closely spaced birth intervals accelerate population growth and undermining development efforts. It makes difficult for women to become productive members of society, thereby limiting their contribution to economic development. Moreover, when a newborn comes, it is likely that the family will invest more of its limited resources in the form of care to the newborn, while the other children will receive inadequate share of the resources [4].

On the other hand, optimal birth spacing (OBS) yields the greatest health, social, and economic benefits for the family. Although, previous research findings advocate an interval length of 2 years between two consecutive births for a better maternal and child health [3], recent evidence showed that births should be spaced at three to five years apart to ensure maximum health benefits for mothers, newborns, and older children[3,4].

The Federal Ministry of Health (FMOH), reproductive health department and health bureaus of respective regions have made concerted effort to reduce fertility and promote the health of the women and their children [7]. Women in Ethiopia however, still experience shorter birth intervals [5]. Ethiopia, the second most populous country in Africa, has a total population of 79.8 million [7] which is significantly rising as compared to the previous consecutive censuses periods (1984 and 1994) when it was about 40 and 53.5 million respectively [8]. Fertility rate is higher (4.8) as compared to the global figure (2.69) [5, 6]. Moreover, maternal and child

mortality are still high. Recent estimates showed that the country still experiences maternal, neonatal and infant mortality of 767/100,000, 37/1000, 59 per 1000 live births respectively [6]. However, little is known about the perceived knowledge of couples on disadvantage of short birth spacing. The aim of this study therefore was to assess perceived knowledge of couples about the disadvantage of short birth intervals among rural couples who had at least two consecutive live births in Arba Minch Zuria district, SNNP, Ethiopia.

Methods and Materials

Study setting and period

This study was conducted from February to April 2014 in Arba Minch Zuria district, demographic and health survey research site. Arba Minch Zuria is one of the districts in south nations, nationalities and people's regional state found in Gamo Goffa zone. It is located in the Great Rift Valley. The administrative town of this district, Arba Minch, is located about 502 Kms to south West of Addis Ababa, the capital city of Ethiopia. The district is situated 1285 meters above sea level. Gamo by ethnicity (69.53%) and Protestants (53.91%) by religion are the dominant ones. According to the figure from central statistical agency, 2007, this district has a total population of 164,529, of which about 82,199 were men and 82,330 were women [9]. In the district, reproductive age women accounted for 45,912 [10]. Regarding health care facility, the district has only three health centers operating currently. It has no hospital of any level. The sub-districts have difficult topography and limited road infrastructures and most of its areas are reached on foot.

Study population

A qualitative study was employed among randomly selected child bearing age women and their husbands who had at least two consecutive live births and the last delivery occurred within the past five years prior to the data collection.

Participant Selection

Study participants were selected purposively in the manner that they can be representative of the mothers with different reproductive history and residence. All the nine rural kebeles (smallest administrative unit in Ethiopia) found in Arba Minch Zuria district DHS research site were first considered. Then, six kebeles (three from the highland and three from the lowland areas) were selected. The high land and low land areas have different socioeconomic status and therefore mothers and their husbands were chosen from both to adequately represent the study area.

Once the study kebeles were identified, parents (mothers and their husbands) living in the six kebeles and having different birth histories were selected purposely from the list of households found in each kebele. Individuals who were believed to be the most informative about the subject under study were selected. Being married, having not been involved in any previous survey and being not related with each other were additional criteria used to select the study participants. To assist in finding and recruiting the discussants, community based health extension workers, development army leaders and kebele administrators were consulted. Once the women were chosen, their husbands were also recruited to the study in order to gain a full understanding of the knowledge and perceptions of birth interval. Mothers and their husbands who were sick and in capable of making discussions at the time of the study were not included. Moreover, development army and women association leaders were purposely excluded from the study, since they were expected to be more aware of the subject of discussion (from training and workshops about maternal health). Discussants were classified by sex, area of residence and level of birth interval to capture heterogeneity among different sub-groups and homogeneity within a group.

To determine children's birth dates and their respective birth intervals, immunization cards were referred. For participants whose children were not immunized, community based health extension workers were consulted since they have full and up to date document of all vital statistics. Finally, child bearing age women who gave birth with in the last five years and had at least two consecutive live births were invited to participate in the FGDs.

In the study, sixteen FGDs were conducted involving a total of 128 participants (64 males and 64 females). Eight groups were from parents who had inter birth interval less than 3 years (four group of husband and four group of mothers) and eight groups were from Parents who had after birth interval three to five years (four groups from each husbands and mothers).

Data collection

Data were collected through focus group discussions (FGDs) with mothers and their husbands to explore their perceptions about inter birth intervals. Open ended semi-structured and flexible questionnaire was used as a guide for the discussion process. The instrument was initially pre-tested in the communities for its cultural relevance.

Separate FGDs for men and women were held. The discussions were conducted in a quiet room according to the preference of discussants to enable them speak more freely about their perceptions. Two moderators and one field assistant were recruited to collect the desired information. One day training was given to data collectors before the actual data collection regarding the aim of the study, data collection tool and procedures. At the beginning of the discussion, the moderator introduced all participants, explained the topic and purpose of the discussion, and made them aware that each and every opinion was important and wanted and should feel free to express.

Husbands' FGDs were moderated by the principal investigator. Since mothers could relatively openly express their ideas with females without being afraid and shy, FGDs for mothers were moderated by registered female BSc Nurse. Data were tape recorded by a research assistant after thorough communication had been made with discussants. Each FGD lasted between 80-120 minutes. Two FGDs were performed each day so that emerging issues could be incorporated into subsequent FGDs. The number of FGDs was determined by the saturation of ideas (conducting FGDs stopped when no more new ideas emerged). Discussion questions included: perceived knowledge about short and optimal birth intervals, perceived disadvantages of short birth intervals, perceived advantages of optimal birth intervals, reasons for having short birth intervals, decision making about inter birth intervals, perception and awareness of modern contraceptive methods, and effect of culture and religion on decision making about inter birth intervals.

Data analysis

All the audio taped FGDs were transcribed verbatim after listening again and again. All observations made by the field assistant were recorded as field notes. Then, translation was made from Amharic (official and working language) to English. To assure the validity of the translation, another person, proficient in both languages checked and commented on it. Both transcription and translation of FGDs were made by the investigators. When there was no consensus during translation, both the principal and co-investigators replayed the original recordings and compared with the transcripts until agreement was reached. Finally, the principal investigator double-checked against the original recordings and the research team analyzed using content analysis.

Before coding, reading and re-reading was made by the principal investigator. Summarizing of the word for word transcripts was carried out. The transcripts (questions and their respective responses) were prepared in Microsoft word, saved in plain text and entered to open code software (qualitative data analysis software). Once it is entered, the investigators read the transcript again in order to become familiar with the responses. Then, the transcripts were coded according to the emergent categories. Both of the investigators conducted the coding process and together they reached a consensus. After completion of the coding process, themes were developed and classified. Contents were also supplemented with illustrations of direct quotes from the discussion. Then, final themes were compared among various groups' discussants to know the differences and similarities according with their perspectives about factors influencing short birth intervals. The findings were finally presented in the form of narratives.

Ethical Consideration

After approval, ethical clearance was obtained from institutional Review Board (IRB) of College of Medicine and Health sciences, Arba Minch University. Then, official letter was written from College of Medicine and Health sciences to Arba Minch Zuria district health office. Permission letters from district health office were processed before starting data collection. Written informed consent was obtained from each respondent prior to their inclusion in the study. Each participant was briefed on the study's background and objectives. Mothers were also informed that all the data obtained from them would be kept confidential and anonymous but their opinions and views would be included in the study to help improve the health status of women and children. To ensure confidentiality, names of respondents were replaced by code numbers. Group consent was also sought prior to audio taping of sessions.

Result

In this study, sixteen focus group discussions involving a total of 128 participants (64 males and 64 females) were conducted. Eight groups were from parents who had inter birth interval less than 3 years (four groups of husbands and four groups of mothers) and eight groups were from Parents who had inter birth interval of three to five years (four groups from each husbands and mothers FGDs).

All discussants were health development army members. Short and optimal birth spacing participants ranged in age from 22 to 35 years and from 23-44 years respectively. Educationally, majority of the mothers and husbands did not attend formal education. Almost all of the women and men discussants were house wives and farmers respectively. Their parity and inter birth intervals ranged from three to nine and one to five years respectively. The contents of the discussion included: perceived knowledge women and men about short and optimal birth intervals, perceived disadvantages of short birth intervals, perceived advantages of optimal birth

intervals, reasons for having short birth intervals, decision making about inter birth intervals, and the effect of religion on decision making about inter birth intervals.

Definition of inter birth spacing

Almost all mothers and husbands discussants defined birth spacing correctly. For all of them, birth spacing until the next delivery was understood as extending the period of time between the two consecutive births in the manner that could allow the mother to recover from pregnancy, labor, childbirth and lactation; replace her nutritional stores and provide time for the last child to self-feed and take independent care. The duration of time for short inter birth interval as defined by majority of the women and men discussants conformed to the world health organization recommendation. According to them, short birth interval refers to birth interval of less than three years. However, discussants were unable to differentiate between optimal and long birth intervals. Majority of the discussants who were experiencing short and optimal birth intervals realized that birth interval is said to optimal when it is greater than three years was.

Perceived advantage and disadvantage of short inter birth intervals

Perceived advantages of short birth spacing

Irrespective of their birth spacing status, majority of the discussants from all categories underlined that short inter birth intervals are by no means important for the health of the mother, the new born baby, the father, the rest of the children at home and the overall quality of life of the family. They reported that it deteriorates the health and economic states of the family. They further justified that mothers were having short birth intervals not because they believed it is beneficial but because of the influence of their husbands and religion, lack of health care information and inaccessibility of reproductive health care services.

“...from my experience women believe that closely spaced births are beneficial to nether of the family members. They are giving birth with in short time intervals because of different negatively influencing internal and external factors.”(A 29years old mother from short birth spacing group).

Very few advantages were noted by some of the discussants. Some women and husbands who were experiencing short birth intervals addressed that having closely spaced births were advantageous to early complete giving child birth before the woman gets weak. *“Giving birth when the mother becomes old exposes to economic and health problems. Moreover, when the mother becomes sick as a result of labor and delivery she does not produce enough milk to the child” (A 34years old mother from short birth spacing group).* Some also believed that if the index child was female the woman should frequently give birth until she gets a boy.

Perceived disadvantages of short inter birth spacing

Majority of the discussants noted birth interval as period for parents and children to make adequate preparations to receive anew born child and give appropriate care. It is the time when the mother primarily gets ready physically, mentally and economically. Unless this interval is planned and sufficient preparation is made, the outcome will be devastating to the health of the mother, the fetus in the womb, the father and the rest of the children at home. *“Those who have closely spaced births are nutritionally deprived and not healthy. Besides, it decreases the productivity of the family, particularly the mother.” (A 30years old husband from short birth spacing group).* According to the discussants, in most cases the mother is the primary care giver. Therefore, her health condition has a direct impact on the children in particular and the family as a whole. They noted that childbirth and lactation weakens the mothers' physical condition. Any childbearing related strain before the completion of at least 3 years, would endanger her life, lead to the lactating period being reduced and thereby, directly affecting the child's nutrition and growth. In addition to this, physical weakness means that the capacity of the woman to execute household responsibilities is reduced. *“Yeah, if the mother got pregnant before she recovers, she will not be healthy and never be productive to the family. When the mother is sick, the infant will be sick too” (A 30years old husband from short birth spacing group).* This could be a big problem particularly in communities whose socioeconomic status is poor. Thus, the disadvantage of short birth spacing was classified in to three sub-themes: physical, psychological and financial disadvantages.

Disadvantages for the mother

There was a general agreement among all focus groups that optimally spaced births allow the mother to recover from pregnancy, child birth and lactation; replenish her nutritional stores and provides time for the last born to self-feed and care. On the other hand, if child birth is closely spaced the mother faces multiple problems. Their health condition would be deteriorated through bleeding, anemia, nutritional deficiency, and child birth related trauma. Psychologically, it was felt that the mother would experience higher stress, exhaustion, be less relaxed and does not have adequate time to take care of herself, her last born child, her home and her husband.

“If the mother does not get sufficient rest after the preceding birth when she can regain important nutrients, and recovers from physical and psychological health problems the health of the mother herself, and her new

born child will be endangered. Yeah, the family will not be stable and peaceful because the disturbance of health condition.”(A 35 years old woman from optimal spacing group). Unhealthy and psychologically unstable mother would be more likely to have a negative effect on the well-being of the newborn.

Disadvantages for the husband

Almost all discussants understand that closely spaced birth intervals negatively affect the father in terms of health and economic status of his family. They noted that, when the mother is sick, and has many closely spaced children demanding beyond the house hold capacity, the father would psychologically be ill. **“If the number of children is increasing, demand for additional resources and further poverty will be the end result. It also keeps children out of school. These all are burden to the father and make him psychologically sick” (A 32 years old husband from optimal spacing group).** He will not be productive in his work and will lead a stressful life. Financially, he might not have an opportunity to save money and invest in his family and would be overwhelmed by the needs of his growing family. Some discussants indicated that if the husband did not receive the attention and comforts he expected, he might consider taking another wife to provide the care and comfort missing from the relationship with his current partner. This seriously affects the life of the family as a whole.

Disadvantages for the preceding and the new born child

Participants believed that mothers who space their children have more time to assure their children are clean, well-fed and loved, have adequate clothing and affection and are taken care of when sick. They felt these advantages would ensure that the child grows up healthy and cared for, with greater physical, mental and emotional wellbeing. On the other hand, if children are closely spaced the last two children can partly or wholly lack all the above activities mentioned. If both of the children are dependent for care as a result of closely spacing, the attention of the mother and the resources will be divided between them. They do not get adequate cloth, food and attention, not appropriately feed, cleaned and shared the love of the mother. **“If children are born in less than 3 years, they become short and thin. They remain seated. They never walk on time. Besides the health of the mother and father will be affected” (A 36 years old husband from optimal spacing group).** In addition, the duration of breast feeding will be short and the preceding child will never get the entire nutrient he has to from his mother. **“If children are born in less than 2 years they become poorly nourished because of inadequate breast feeding duration”(A 28 years old Mother from optimal spacing group).** Discussants also believed that the potential for jealousy between young siblings could also be another problem, as the last born would compete with the newborn for his/her mother’s attention and resources.

Decision making process about birth spacing

There was no real consensus as to who makes the ultimate decisions regarding spacing. Almost all of the mothers and their husbands who were conforming to the recommended range of birth spacing (optimal birth interval) reported that decision about when to have the next birth is shared between the couples (Husband and wife). Regardless of who has the upper hand in decision-making, it was reported that planning and discussion accompany the final decision. Even if opinions differ, each partner has to persuade the other when pregnancy should not occur. On the other hand, majority of discussants who had short birth intervals indicated that the decision-making power is vested in the hands of the husband. The majority of husbands and mothers believed that the husband had the decision-making role regarding the timing of subsequent pregnancies. Based on his financial position within the family he had the final say. Discussants added that husbands view their decision as the final word and the wives’ role as trying to persuade him is unlikely. Thus, decision-making is skewed in favor of the man. Some optimal birth spacing mothers noted that, when the mother lives in an extended family, the decision making power is mainly vested in the mother. It is the mother or sometimes the father who had the final say as when to the woman should get pregnant.

Reasons for choosing short birth intervals

Discussants from short spacing groups indicated that community and health care service factors deter women from adhering to optimal birth spacing. Lack of information about the benefit of contraceptive methods and optimal birth spacing was noted as the major obstacle by majority of the discussants from both categories. **“The major why women are experiencing short birth interval is lack of information about family planning methods and birth spacing” (A 34 years old husband from short spacing group).** Moreover, inaccessibility of the reproductive health care service was repeatedly underlined by short spacing mothers and their husbands from the high land areas. Shortage of public transportation service and road infrastructures compounded by the difficult topography of the district makes family planning utilization impossible in the area. The other factors preventing women from having optimal birth spacing are reliance on “clean lactation” and the negative side effects of contraceptive use, which tend to make women partially or completely stop using them and experience method failure. Just the fear of side effects deters some women from using contraceptives. **“As the contraceptive method**

I was using is not comfortable for me I stopped using it and give birth at a short period of time” (A 30 years old husband from short spacing group). Some of the discussants from short spacing group mentioned that husband, parent and religious influence could also prevent women from using contraception and practicing optimal birth spacing. *“Fear of being divorced makes women experience short birth spacing. Lack of education prohibits me from influencing my husband and my life” 29 years old mother from short spacing group).* Few discussants mentioned that if the preceding child is a female they have an intention to give birth frequently until they get a boy.

Discussion

This community based qualitative study identified the perceived knowledge of short and optimal birth spacing couples about the disadvantage of short birth interval among mothers & husbands who had at least two consecutive live births in Arba Minch Zuria District, Gamogofa zone, Ethiopia. Perceived disadvantage of short birth spacing, ultimate decision maker about birth intervals and reasons for experiencing short birth spacing were the major themes emerged from the discussion.

In this study, all of the discussants who were experiencing short and optimal birth intervals had similarly high knowledge about the disadvantage of short birth intervals. Irrespective of their level of birth spacing, majority of the discussants from all categories underlined that short inter birth interval is disadvantageous for the health of the mother, the new born and the preceding baby, the father, and the overall quality of life of the family. They expressed that they are experiencing short birth spacing not because of not being aware about the disadvantage but only because of multi faced contextual factors. This finding agrees with evidence from a study done in Egypt where majority of the discussants were aware that short birth spacing is by far disadvantageous to the family [11]. Some of the discussants also understand that short birth spacing causes economic crisis with in the family. When anew born baby comes, the expenditure of the family for the health care, food and clothing increases. Moreover, the woman becomes unhealthy and spends most of her time in child rearing and her economic contribution to the household is limited. This is congruent with study finding from Egypt and India [11, 12, 13].

Regarding the decision making process, no consensus was reached between the spacers and non-spacers as to whom the ultimate decision about birth spacing should make. Almost all of the mothers and their husbands who were experiencing optimal birth spacing reported that decision as to when to have the next birth is shared between the couples (Husband and wife). Regardless of who has the upper hand in decision-making, it was asserted that planning and discussion accompany the final decision. This finding goes with the result from Pakistan which indicated that health care decision was made jointly based the consensus of the mother and her husband [14]. In contrary, most of the male and female discussants experiencing short birth intervals indicated that the decision-making power regarding birth interval is exclusively vested in the hands of the husband. In Ethiopian culture, the husband has the right to make the final say about house hold decisions and the women and other family members are expected comply with the will of the husband without any dispute. This is in agreement with the study done in Egypt and Pakistan [11, 14].

When asked about factors preventing couples from having optimal birth spacing, most of the discussants from all categories inclusively reported that husband influence was the major factor which deters mothers from practicing optimal birth interval. Consistent with evidence from India [12], Even though mothers know that short birth spacing is harmful to the family, they accept the order of their husband because they respect them. Many discussants also noted that the other factors preventing women from having optimal birth spacing are reliance on “clean lactation” and side effects of contraceptive methods, which tend to make women partially or completely stop using. This is in line with report from Egypt [11]. Lack of information about the benefit of optimal birth spacing and inaccessibility of the reproductive health care service were noted as the major obstacles by majority of the short and optimal birth spacing discussants from the high land area [15]. Shortage of public transportation service and road infrastructures compounded by the difficult topography of the district makes family planning utilization impossible in the area. Unlike the others, few short birth spacing discussants agreed that couples should closely space their birth until they get a boy. This is in agreement with the study done in Ethiopia and Saudi Arabia [16, 17, 18]. This is in contrast with finding from Ethiopian demographic and health survey sex of the index child showed no association with short inter birth interval [6].

When interpreting the finding of the present study, the following limitations should be considered. The source of data for this study was based on the self-report of mothers, and no validation of information was made with any objective sources such as health facility cards except immunization cards of their children. But respondents were critically informed about the importance of giving accurate information by assuring the confidentiality of their responses and it is logical to assume that biases are less likely in birth interval related events as compared to other sensitive issues.

Conclusion

Perceived knowledge of focus group discussants of all categories about the advantage of optimal birth spacing and disadvantages of short birth intervals to the mother, father, the last child, and the rest of the children is very high. Despite their high knowledge, the level of optimal birth spacing practice was limited. Decision-making processes regarding the timing of new pregnancies were made jointly among mothers and their husbands who had optimal birth spaces. Regardless of who had the upper hand in decision-making, both discussants who practiced optimal and short spacing noted that planning and discussion between the partners accompany the final decision. On the other hand, husbands were the ultimate decision makers in deciding when to get pregnant for mothers who had short birth intervals. This is mostly considered to be the man's right to make the decision. Majority of the discussants mentioned that the main reasons why women were not having optimal birth spacing were index child being female, husband influence, religious prohibitions, fear of side effects to use modern contraceptive methods, lack of information about modern contraceptive methods, and inaccessibility of reproductive health care services.

Recommendations

For women to succeed in influencing their husbands and achieving an optimal birth spacing of three to five years, they need the support of their significant family members (husbands, and mothers) and health care providers of all categories. Hence, behavioral change communications (BBC) should target all those who have a direct or indirect influence on pregnancy decisions. Thus, based on the study findings the following actions are recommended:

For the public: The risks associated with closely spaced and frequent pregnancies that may affect the mother, fetus and/or neonate, should be described mainly to the husband using scientific evidences and disseminated to wives, husbands, mothers, and community and religious leaders. Convincing and encouraging religious leaders to disseminate accurate health care messages about birth spacing by providing them with RH training that includes scientific information about OBS. Couples need to understand that the capacity of lactation to prevent pregnancy is only effective when the newborn is under a strict regimen of exclusive breastfeeding and is effective for a maximum of six months; otherwise, the woman may become pregnant before experiencing postpartum menstrual bleeding.

For health care providers: Service providers should promote OBS during FP/RH and MCH client consultations and examinations. Written guidelines regarding optimal birth spacing should be developed and disseminated to increase providers' understanding and persuasion. The district health office together with its stalk holder should make family planning accessible to couples.

Abbreviations

AMU: Arba Minch University; **EDHS:** Ethiopian Demographic and Health Survey; **SSA:** Sub-Saharan African countries; **TFR:** Total fertility rate; **WHO:** World Health Organization; **IBI:** Inter birth interval; **OBS:** Optimal birth spacing; **BCC:** Behavioral change communications

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

DH conceived the study, participated in data collection, performed analysis and interpretation of the data and drafted the paper and prepared all versions of the manuscript. **TG** assisted in the design, participated in data collection, analysis and revised subsequent drafts of the paper. All authors read and approved the final manuscript.

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