ÉDITORIAL

Renforcer les systèmes de données pour promouvoir la santé et les droits sexuels et reproductifs en Afrique subsaharienne

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Le développement de la santé et des droits sexuels et reproductifs (SDSR) en Afrique subsaharienne est fondamentalement entravé par la « pauvreté des données de santé »[1]. Si de nombreux pays à revenu élevé ont réalisé des progrès significatifs dans le renforcement de leurs systèmes de données de santé, l'Afrique subsaharienne continue de faire face à d'importantes lacunes[1–3]. Malgré le besoin crucial de pratiques fondées sur des données probantes, le paysage régional des données est caractérisé par une méconnaissance généralisée de la valeur intrinsèque de données exactes. De nombreux pays de la région ne disposent pas de recensements de population réguliers, de dossiers de santé fiables ni de systèmes fonctionnels d'état civil et de statistiques vitales.

L'exactitude des données est souvent compromise par une réticence profondément ancrée des populations à fournir des informations personnelles. Dans de nombreux contextes africains, les tabous culturels, les croyances religieuses et la méfiance envers les « étrangers » entraînent des taux de refus élevés lors des enquêtes menées auprès des ménages et dans les établissements de santé. Par exemple, une étude menée en Afrique du Sud a mis en évidence comment des femmes peuvent refuser de parler de santé reproductive en raison d'une opposition religieuse ou par crainte d'être jugées par les chercheurs[4]. Les données sont parfois sujettes à la falsification et au biais de désirabilité sociale. Les personnes interrogées « apprennent » souvent à répondre de manière à minimiser la longueur des questionnaires, par exemple en déclarant moins de partenaires sexuels pour éviter les questions complémentaires.[5]

Plus grave encore, la crainte de répercussions juridiques ou sociales conduit à la dissimulation active d'informations sensibles par les individus et les établissements de santé. Des personnes ont déclaré avoir menti sur leur statut sérologique ou sur les violences sexistes qu'elles ont subies par crainte d'une intervention policière ou de la stigmatisation sociale.[4]

Même lorsque des données sont disponibles, on observe une minimisation et une non-utilisation systématiques des informations factuelles pertinentes pour la prise de décision et la planification stratégique. L'institutionnalisation du suivi fondé sur les données demeure faible et les plans annuels sont souvent élaborés sans tenir compte des informations sanitaires courantes.[6] Dans de nombreux cas, la planification fondée sur des données probantes est supplantée par l'ingérence politique et le népotisme, où les intérêts politiques — plutôt que les données empiriques — déterminent quels programmes de santé sont mis en œuvre et qui est nommé pour les diriger.[7] Sans s'attaquer à ces barrières culturelles et structurelles, les systèmes de données continueront de produire des informations de mauvaise qualité qui ne permettront pas d'améliorer significativement les résultats en matière de santé sexuelle et reproductive dans la région.[1,8]

Depuis la Conférence internationale sur la population et le développement (CIPD) du Caire en 1994 et jusqu'aux Objectifs de développement durable (ODD) pour 2030, la santé sexuelle et reproductive est reconnue comme un droit humain fondamental.[9–11] Ce droit est désormais inscrit dans les politiques nationales de santé et les cadres juridiques de nombreux pays.

Le droit à la santé sexuelle et reproductive comprend l'accès à la contraception, aux soins de fertilité et d'infertilité, aux services de santé maternelle et périnatale, à la prévention et au traitement des infections sexuellement transmissibles, à la protection contre les violences sexuelles et sexistes, et à l'éducation à des relations saines et sans risque.[12] comprend également le droit à l'information et la capacité de faire des choix éclairés concernant sa vie reproductive.

Lorsque cet accès est retardé ou refusé, les conséquences peuvent être graves, notamment le décès, un handicap permanent et des difficultés socio-économiques. Pour que ces droits se concrétisent, les systèmes de santé ont besoin de systèmes de données robustes. Des données précises, actualisées et

ORIGINAL RESEARCH ARTICLE

Assessment of pregnant women's awareness and practice of antenatal care in Mosul, Iraq

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Abstract

This study evaluated pregnant women's awareness and practice of antenatal care by using a cross-sectional study design. A structured questionnaire was used to collect data from pregnant women attending Al-Sukkar Primary Health Centre in Mosul, Iraq over a period of three months from 1 November2024 to 2 February 2025. The results showed that pregnant women had knowledge gaps pertaining to awareness of warning signals during pregnancy. The majority of participants, pregnant women demonstrated a positive attitude. Approximately half of the participants (52.4%) were regular in their visits and 31.8% reported more than five visits. Good knowledge and favourable attitude were significantly higher among employed women with a university education. In contrast, women with secondary education, those in the third trimester and house wives demonstrated, better practices. We conclude that improving and enhancing awareness about the proper utilization of antenatal care practices will be critical to improving maternal health outcomes in Mosul, Iraq. *(Afr J Reprod Health 2026; 30 [12]: 54-61).*

Keywords: Antenatal care, pregnant women; awareness; knowledge; attitude; practice; Mosul; Iraq

Résumé

Cette étude transversale a évalué les connaissances et les pratiques des femmes enceintes en matière de soins prénatals. Un questionnaire structuré a permis de recueillir des données auprès de femmes enceintes fréquentant le centre de santé primaire Al-Sukkar à Mossoul, en Irak, sur une période de trois mois, du 1er novembre 2024 au 2 février 2025. Les résultats ont révélé des lacunes dans les connaissances des femmes enceintes concernant les signes d'alerte pendant la grossesse. La majorité des participantes ont manifesté une attitude positive. Environ la moitié d'entre elles (52,4 %) se rendaient régulièrement à leurs consultations et 31,8 % ont déclaré avoir effectué plus de cinq visites. Les femmes actives et diplômées de l'université présentaient des connaissances et une attitude favorables significativement plus élevées. En revanche, les femmes ayant un niveau d'études secondaires, celles au troisième trimestre de grossesse et les femmes au foyer ont démontré de meilleures pratiques. Nous concluons que l'amélioration et le renforcement des connaissances sur le bon usage des soins prénatals seront essentiels à l'amélioration de la santé maternelle à Mossoul, en Irak. *(Afr J Reprod Health 2026; 30 [12]:54-61).*

Mots-clés: Soins prénatals, femmes enceintes ; sensibilisation ; connaissances ; attitude ; pratiques ; Mossoul ; Irak

Introduction

Pregnancy is a critical period for women. Antenatal care is an area of primary health care centred on providing care for pregnant women and their foetuses to support their pregnancy by providing education, screening, advice, treatment and monitoring services.[1,2] Approximately 260000 women around the world die each year from avoidable causes related to pregnancy and childbirth. In 2023, there were 700 maternal deaths every day on average.[3] Although the global maternal mortality ratio (MMR) dropped by 44% in 2015 compared to 1990, such a decline is unsatisfactory, especially in developing countries where the maternal mortality rate is 200 times higher than in developed countries.[4,5] Maternal mortality is another important health indicator that addresses community health and socio-economic disparities and should be reduced by enabling maternal accessibility to antenatal health care.[5, 6] Accordingly, efficient utilisation of antenatal care services is the main strategy to reduce maternal mortality and morbidity, together with provision of good information for pregnant women regarding child birth and how to prevent associated problems.[7] According to Thaddeus and Maine's three delays model, maternal mortality is mainly due to delays across three phases: first in the decision to seek appropriate obstetric care, second

in accessing suitable obstetric health care facilities and third, in receiving proper care at the health facility.[8] Researches show that regular and continuous antenatal care in accessible and high quality clinics with proper care prevents problems and decreases deaths during pregnancy by managing coexisting problems through the provision of different services.[1,9] In Iraq, antenatal care is provided free - of charge at governmental primary health centres with a notable progress made in meeting several criteria stated in the Millennium Development Goals (MDGs) concerning maternal and child health. However, there are no significant decrease in maternal mortality as a result of long periods of conflict and political instability.[9] According to statistics from the Ministry of Iraqi Health, 2017, the direct cause of maternal mortality were haemorrhage form 32.4%, pre-eclampsia and eclampsia 14.5%, thromboembolism 14.4% uterus rupture 4.7%, and sepsis 4.4%.[10] To improve maternal outcomes, improving good knowledge and attitude toward antenatal care services is essential.[11] Therefore, the aim of this study is to evaluate awareness and practice regarding antenatal care among pregnant women in Mosul City.

Methods

To achieve the purpose of this study, a cross-sectional study design was employed. The study was conducted in Mosul City, which is the second-largest city in Iraq, the capital of Nineveh Governorate. The data were collected by direct interviews with pregnant women attending Al-Sukkar Primary Health Care Centre during the study period.The data collection period ranged from 1 November 2024 to 2 February 2025 to satisfy the three- month collection period requirement.

The study participants included apparently healthy pregnant women who had agreed to participate. Any pregnant women with comorbidities or with acute illness, or who refused to participate, were excluded.

The sample was calculated using the formula of cross-sectional studies N= Z2 P (1-P)/d2, where N: refers to sample size, Z: to a level of confidence of 95% (1.96), P: to the proportion of pregnancy in Mosul, which corresponds to 20%, [11] and d: to the desired level of absolute precision (0.05). Based on this formula, the required sample was 245 and the calculated sample was 252.

Data collection tool

A structured questionnaire form was designed to collect the data. The content validity of the questionnaire was evaluated by the teaching staff in the Department of Family and Community Medicine at the Mosul College of Medicine regarding its clarity, coverage and relevance. According to the staff's subjective judgment, the overall validity was equal to 90%. A pilot study was conducted to examine the reliability of the questionnaire and its practicality. According to the pilot participants' answers in the pre-test and post-test; the reliability index of the questionnaire was equal to 88%.

The questionnaire consisted of four parts. The first part correlated the socio-demographic structure of participants. The second part assessed participants' knowledge of antenatal care through questions about general information and dangerous signs of pregnancy. The participants' answers were either yes or no, with one point awarded for each correct answer and zero for wrong answers. Regarding dangerous signs of pregnancy, point was given for each correctly selected dangerous sign. The third part designed to identify participants' attitude toward antenatal care through a series of questions with three Likert- scale options: 'agree', 'borderline' and 'disagree'. Each positive response was attributed one point with zero points attributed for neutral and negative attitudes. The final part of the questionnaire evaluated contributors' practice in relation to antenatal care through several questions that focused on participants' practice regarding different aspects of antenatal care. Some of the practice questions, such as the first, second and fourth questions were multiple choices, with higher scores given for the most appropriate practice and lower scores for less appropriate practice. The remaining questions were yes/no questions, with a point awarded for either response.

Data analysis

The collected data were entered into Microsoft Excel and transmitted to the software SPSS version 26 for data analysis. Descriptive statistics were used to determine the results, which were presented in tables with columns presenting the scores by number and percentage. Data attributed to the participants' knowledge, attitude and practice level were obtained by calculating the total scores for

correct or appropriate answers. Participants who obtained scores above the median were considered to have good knowledge, a favourable attitude, or good practice, while those below the median were considered to have poor knowledge, an unfavourable attitude, or poor practice. Accordingly, the median scores for knowledge, attitude and practice were 11 out of 16, 5 out of 7 and 7 out of 9 questions respectively. Statistical differences and associations between socio-demographic features and knowledge, attitude and practice levels were calculated by chi- square test with a p-value equal or less than 0.05.

Ethical approval

The ethical Committee at the College of Medicine/ University of Mosul, granted ethical approval (ref.no: UOM/COM/MREC/23-24/may1, Date 26/5/2024) for this study. Participation was voluntary and oral consent was obtained from contributors.

Results

Table 1**,** more than half (53.2%) of study population were in the 20-30 year-old age group, while 42.5% were illiterate or had only received primary education. Nearly three quarters (74.2%) were housewives. On the other hand, 58.7% had two to four children and 76.2% were in the third trimester.

Table 2 reveals that the pregnant women in this study had good knowledge about some aspects of antenatal care, such as selecting hospital as a safe place for delivery, the harmful effects of smoking and alcohol, the importance of folic acid and iron supplementation during pregnancy, and early breast feeding with rates of 99.2%, 98.4%, 98% and 92.5%, respectively. However, the study also identified gaps in their knowledge regarding number of required visits; importance of screening for hepatitis B, C, HIV and syphilis; and regular weight measurement with rates of 46.4%, 44.8% and 63.5%, respectively. Just over half of participants (55.2%) thought that the first visit should be made once pregnancy is confirmed. Additionally, pregnant women showed gaps related to knowledge of warning signs during pregnancy, with 22.2% recognising convulsion as an identifier.

Table 3 shows that the majority of pregnant women had a positive attitude about delivery under medical supervision and obeying doctors' dietary recommendation by 98.4% and 88.5%, respectively. However, positive attitudes were lower regarding the required number of visits to antenatal clinic, importance of screening during pregnancy and the importance first visit once pregnancy was confirmed by 42.1%, 55.1% and 65.5%, respectively.Table 4 shows that 77.4% of pregnant participants depended on private clinics for follow up of their pregnancy, with 70.6% making the first visit in the first trimester. Just over half (52.4%) of participants were regular in their visits, approximately one fifth (19.4%) had not visited an antenatal care clinic and 31.8% had more than five visits. The majority followed doctor's recommendations for folic supplementation, taking adequate rest and following dietary recommendations, by 94.4%, 90.5% and 91.7%, respectively. As Table 5 illustrates good knowledge was highly significant among women with university education (74.7%) and those who were employed (78.5%, p<0.001), and was significantly higher among women with two to four children (62.2%, p=0.045). A favourable attitude was also highly significant among women with university education (85.5%) and those who were employed (78.5%, p<0.001). Regarding antenatal practice, women with secondary education and those in the third trimester demonstrated higher level of good practice (62.9% and 57.3%, respectively, with a highly significant difference, p=0.005 for both),

Table 1: Socio-demographic characteristics of participants' pregnant women (n=252).

Variable	No.	(%)
Age in years		
<20	39	15.5
20 -30	134	53.2
>30	79	31.3
Education		
Illiterate and primary school	107	42.5
Secondary school	62	24.6
University	83	32.9
Occupation		
House wife	187	74.2
employed	65	25.8
Parity		
1	66	26.2
2-4	148	58.7
>4	38	15.1
Trimester of pregnancy		
first and second	60	23.8
third	192	76.2

Table 2: Knowledge of study population about antenatal care during pregnancy

General information	Correct answers	
	No.	%
Should pregnant lady attend antenatal care clinic?	209	82.9
Is it mandatory for pregnant lady to do at least 4 visits to antenatal clinic even if she feels healthy?	117	46.4
Is it necessary for a pregnant woman to undergo screening for hepatitis B, C, HIV, syphilis?	113	44.8
Should a hospital be prioritized as the safe place for delivery?	250	99.2
Is smoking and alcohol harmful for pregnancy?	248	98.4
Is Tetanus toxoid vaccine important to be taken by pregnant lady?	188	74.6
Is it important to measure the weight during pregnancy?	160	63.5
Is it necessary the supplementation of folic acid and iron during pregnancy?	247	98
Is it important to immediate breast fed of the baby soon after delivery?	233	92.5
The first visit at antenatal clinic should done:		
Soon after pregnancy is confirmed	139	55.2
At any time during pregnancy	99	39.3
Before ending first twelve months	14	5.6
Alarming signs during pregnancy are:		
High fever	133	52.8
Swelling of the hand and legs	65	25.8
Abdominal pain before labor time	136	54
Anemia	172	68.3
Convulsion/fits	56	22.2
Vaginal bleeding	142	56.3
Average knowledge (Mean ± SD)	10.984± 2.616	

Table 3: Demonstration of positive attitude of pregnant women regarding antenatal care.

Attitude Statements	Positive attitude	
	No.	%
First visit to antenatal clinic have to be done in first trimester of pregnancy	165	65.5
Antenatal examination is crucial for pregnant lady	174	69.0
Pregnant lady should made at least 4 visits to ANC.	106	42.1
During ANC visit infection screening should be done as a part of checking.	139	55.1
Regular monitoring of blood pressure is crucial for pregnant lady	198	78.6
Pregnant lady obliged to modify her diet according to doctor advice.	223	88.5
For better health to the baby delivery under medical supervision is recommended.	248	98.4
Average attitude (Mean ± SD)	5.000± 1.612	

Table 4: Presentation of antenatal practice among participants' pregnant women

Required practice	No	%
When you diagnosed as a pregnant who you consult to fallow your pregnancy		
Antenatal care health center	53	21.0
Nurse or midwife or a relative	0	0
Private clinic	195	77.4
Don't consult any one	4	1.6
During which period make your first visit to ANC clinic		
In the first trimester	178	70.6
In the second trimester	33	13.1
In the third trimester	6	2.4

Didn't make a visit	35	13.9
Are you regular in your antenatal care visit schedule?		
Yes	132	52.4
No	120	47.6
No. of antenatal visits did you make?		
No visit	49	19.4
One	18	7.1
Two	40	15.9
Three	30	11.9
Four	35	13.9
Five and above	80	31.8
Are you taking folic acid and iron as prescribed by your doctor?		
Yes	238	94.4
No	14	5.6
Are you taking proper rest as advised by your attending doctor?		
Yes	228	90.5
No	24	9.5
Do you made changes in diet plan as advised?		
Yes	231	91.7
No	21	8.3
Average practice (Mean ± SD)	6.488±1.863	

Table 5: Association between knowledge, attitude and practice with socio-demographic characteristics of study participants.

Socio-demographic features	**Frequency of Good knowledge**	**p-value***	**Frequency of favorable attitude**	**p-value***	**Frequency of Good practice**	**p-value***
Age in years	**No (%)**		**No (%)**		**No (%)**	
<20	19(48.7)	0.47	19(48.7)	0.076	19(48.7)	0.47
20 -30	75(55.9)		79(58.9)		75(55.9)	
>30	38(48.1)		55(69.6)		38(48.1)	
Education						
Illiterate and primary school	49(45.8)	<0.001	50(46.7)	<0.001	61(57)	0.005
Secondary school	32(51.6)		32(51.6)		39(62.9)	
University	62(74.7)		71(85.5)		32(38.5)	
Occupation						
House wife	92(49.2)	<0.001	101(54)	<0.001	106(56.7)	0.020
Employed	51(78.5)		51(78.5)		26(40)	
Parity						
1	29(43.9)	0.045	44(66.7)	0.460	33(50)	0.900
2-4	92(62.2)		88(59.5)		79(53.4)	
≥4	22(57.9)		21(55.3)		20(52.6)	
Trimester of pregnancy						
1st and 2nd	28(46.7)	0.071	37(61.7)	0.796	22(36.7)	0.005
3rd	115(59.9)		116(60.4)		110(57.3)	

* Chi-square test was used

and house wives demonstrated higher level of good practice (56.7%, p= 0.020).

Discussion

In the present study, the majority of pregnant participants demonstrated good knowledge about some aspects of antenatal care, such as the safety of hospital delivery, the dangerous effects of smoking and alcohol, the significance of folic acid and iron intake throughout pregnancy, and early breastfeeding. Other studies have reported comparable findings.[12-14]This correlation is likely due to how information is disseminated through

social and mass media. However, in our study, there were gaps in participants' knowledge, such as the number of required antenatal visits and the importance of screening, with 46.4% and 44.8% of participants indicating familiarity with these points, respectively. In comparison, 84% and 72% of participants in the study by Sadiq et. al. were familiar with the required number of visits and significance of screening.[12]

A higher proportion (95.8%) was aware of the required number of visits and screening in the study by Gebremariam et. al. [15] This finding reflects the actual shortage of antenatal health education in our locality. In addition, 55.2% of participants in our study understood that first visit should be done once pregnancy is confirmed. Similarly, 29.8% of participants in a study conducted in Saudi reported that the first visit should take place once pregnancy is confirmed and 13.5% during the first trimester.[16] This situation may be related to regional and cultural factors concerning later stages of pregnancy and delivery, or the desire to identify the sex of the foetus, especially in the eastern region. In our study, pregnant women exhibited knowledge gaps related to warming signs during pregnancy, especially convulsion, with only 22.2% recognising this sign. Regarding warming signs, in an Egyptian study, the most commonly recognised signs were vaginal bleeding and, severe abdominal pain (69.8% and, 56.2%, respectively). [17] In India, the top rated warming signs are pain in abdomen, swelling on hand and foot and anaemia with 70%, 57.5% and 52.5%, respectively.[18]These findings are most likely related to pregnancy experience rather than structured education and information.

The majority of pregnant women in this study shared positive attitudes about delivery at hospital, doctors' dietary recommendation and regular monitoring of blood pressure, with 98.4%, 88.5% and 78.6%, respectively. In line with this finding, 88.3% of participants in Nepal agreed with delivery at hospital.[13] In contrast, in a study from Pakistan, fewer participants (61.5%) agreed with modification of diet during pregnancy.[5] However, in our study, positive attitudes were lower regarding the number of visits to antenatal clinic, screening during pregnancy and the time of first visit, with 42.1%, 55.1% and 65.5%, respectively. In contrast, 90.3% of participants in a study in Eritrea agreed on the importance of antenatal screening.[15] In this study the participants' attitude was in alignment with their knowledge about these issues, which reflect the influential effect of knowledge on attitude.

Regarding antenatal practice, despite the data gathered from the governmental health institution, 77.4% of pregnant participants depended on private clinics to follow up their pregnancy. In fact, in our locality, pregnant ladies mainly visited governmental health institutions for immunisations or to obtain the maternity and child health handbook. In contrast, in India and Somaliland, 43.25% and 63.8% consulted governmental health institutions.[19, 20] In Iraq, although public health services were affordable and at a low cost, people chose private health services, which may be related to longer waiting times or diminished confidence of the quality of care in governmental health institutions.[10] On the other hand, in the current study, 70.6% of contributors made their first visit in the first trimester. A little more than half (52.4%) were regular in their visits and 31.8% had more than five visits. In an Egyptian study, 62.8% made their first visit within 12 weeks of gestation.[21]In comparison, in the United Arab Emirates, 50.2% of participants reported their first visit after four months of gestation. [22] In a Tanzanian study, 50.3% had adequate ANC visits.[23] Lower numbers of visits were reported in a Somalia, India and Somaliland [19, 20, 24] In an earlier study in Mosul City, 84% of pregnant participants had regular ANC visits.[25] These findings highlight the importance of increasing public awareness about the impact of routine antenatal care as a preventive measure to improve the health outcomes of both the mother and new- born.

In the present study, the majority followed doctor's recommendations for folic supplementation, taking adequate rest and dietary recommendations. These findings agree with other studies.[13, 16, 26] In general, there are commitments to these practices that may relate to awareness about their importance and feasibility of their application.In the current study, good knowledge was significantly higher among women with university education, those who were employed and among women with two to four children.

This finding is in line with other studies in which education and, employment, together with parity and age, were associated with better knowledge.[14, 22, 27–30] In addition, favourable attitude was highly significant among women with

university education and employed. Regarding antenatal practice, women with secondary education, those in the third trimester and house-wives indicated high level of good practice. In comparison, higher levels of good practice were observed among high parity and multigravida.[15] The higher level of practice among those with secondary education and unemployed most likely correlate with knowledgeable women's belief in depending on self-care with late and lower number of visits to ANC and less adherence to doctors' recommendations. On the other hand, higher levels of practice among women in the third trimester may relate to number of visits, while women in the first trimester usually have fewer appointments, resulting in poor practice. It was also found that high levels of knowledge and attitude are not always associated with good practice.[15, 28] Further, good knowledge and attitude not always translate to good practice due to some barriers such as risk recognition, social support, or the quality of given care; therefore these obstacles should be evaluated carefully.

Strengths and limitations

One limitation encountered in this cross-sectional study concerns that did not permit a rigorous causal analysis of the results, and the use of a questionnaire as it may subject to recall bias; however, inviting women who are currently pregnant reduces such bias. Also, the focus on one primary health centre may reduce its generalizability. Thus, it is recommended that future studies be conducted from multiple study setting.

Conclusions and recommendations

Pregnant women demonstrated good awareness about several common aspects of antenatal care, such as significance of delivery at hospitals, the harmful effects of smoking and alcohol, the importance of folic acid and iron supplementation during pregnancy, and early breastfeeding. However, there were gaps in their awareness and practice regarding alarming signs of pregnancy, the required number of visits to antenatal clinic, and screening during pregnancy. While higher levels of education and employment were associated with good knowledge and attitude housewives and participants in the third trimester were associated with good practice.Based on the above findings, adopting a national strategy to improve comprehensive awareness about antenatal care, together with evaluating and eliminating obstacles that impede proper utilisation of these services are suggested implementations. Further, improving the quality of antenatal care centres in governmental health institutions is additional recommendation.

Conflict of interest

The authors declare that no conflicts of interest are present.

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Authors' contributions

All authors contributed in the conceptualisation and design of the study. They contributed to drafting the manuscript and gave their final approval to the manuscript submitted for publication.

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