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Factors Influencing Induced Abortion in Cambodia: Evidence from Cambodian Demographic Health Survey 2021-2022

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ABSTRACT

Introduction

Despite legal abortion services, unsafe practices persist in Cambodia, with few national studies examining the factors of women who choose abortion. Therefore, this study was carried out to find out the factor influencing induced abortion among the women of reproductive age group of Cambodia.

Methods

We used data from the 2021-2022 Cambodia Demographic and Health Survey. The primary outcome was a report of induced abortion as recorded in the pregnancy history in the last three years. Bivariate and multivariate logistic regressions were performed using SPSS 21.

Results

Out of 6156 women, 8.8% reported an induced abortion within three years. Women aged 35-49 had higher odds (Adjusted Odds Ratio (AOR), 2.70; 95% CI, 1.47-4.98) of having had an induced abortion compared to women aged <20 years. Women from the poorest wealth quintiles were less likely to have an induced abortion (AOR, 0.53; 95% CI, 0.37-0.76). Women who had 3 or more children of under 5 years were 90% less likely to have abortion (AOR, 0.10; CI (0.04-0.23) as compared to those who didn't have under five children. Women who had used contraception currently had higher odds of induced abortion (AOR 1.96; 95% CI, 1.56-2.45) as compared to non-user. Exposure to media was also a significant factor of the abortion (AOR, 1.30; 95% CI, 1.01-1.69).

Conclusion

In Cambodia, age, wealth quintile of respondents, number of children of under 5 years, media exposure and current use of contraceptive methods influenced induced abortion among women. Interventions targeted at young, poor, women with more than three children of under 5 years and from rural area and remote individuals can address unequal access to abortion services.

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Introduction

Induced abortion is the intentional termination of pregnancy either medically or surgically means of ending pregnancy before the time of fetus viability, which can be safe or unsafe [1, 2]. It is a common gynecological procedure because legal abortion may not necessarily equate to safe abortion in some parts of the globe. So, it is crucial to use the terms "safe" or "unsafe" when discussing induced abortion. Unsafe abortion is characterized as: "a method intended to end an unintended pregnancy that is carried out by people lacking the requisite skills, in a setting that does not meet the bare minimum of medical standards or both" [3].

Complications associated with unsafe abortion include maternal deaths and morbidities like severe hemorrhage, infections, trauma, and renal failure [4, 5]. Globally, 73 million induced abortions were carried out annually. Out of ten unintended pregnancies, six ended in an induced abortion [6]. Abortion rates have significantly decreased in high-income nations while remaining stable in low and middle-income nations [7]. Nearly 50% of unsafe abortions took place in underdeveloped nations, including Cambodia [8, 9]. Additionally, according to the data from Cambodia Demographic Health Survey (CDHS), 8.6% of reproductive women in Cambodia between the ages of 15 and 49 had an induced abortion [10].

In Cambodia, in response to high maternal mortality, the abortion law was reformed in 1997 to allow abortion on request until the 12th week of pregnancy, and in certain circumstances during the second trimester. According to the law, abortions can only be performed by medical doctors, medical practitioners or midwives authorized by the Ministry of Health and only carried out in a hospital, health center, health clinic or maternity ward [11]. Despite the legalization of abortion laws and advancements in modern healthcare technologies, unsafe abortion remains a persistent issue. The risk of complications from abortion is heightened due to factors such as unmet family planning needs, rape, and early sexual activity [12, 13]. Study conducted in Sub- Saharan Africa using data from the Cameroon Demographic Health Survey found that women who were exposed to spousal violence were 50% more likely to experience at least one episode of pregnancy loss compared with women not exposed to violence [14]. Therefore, the study was carried out to find out induced abortion and the factors influencing induced abortion among women of reproductive age in Cambodia using data of Demographic and Health Survey.

Methods

Data source

This study used data from the Cambodia Demographic and Health Survey (CDHS) 2021-22. In brief, the sample selection was based on two-stage cluster sampling design for urban and rural areas and each of Cambodia's 25 provinces. The first stage involved selection of clusters. A total of 709 clusters was selected; 241 in urban areas and 468 in rural areas. The second stage involved systematic sampling of households. Thirty households were selected from each cluster, for a total sample size of 21,270 households. The 2021–22 CDHS interviewed 19,496 women aged 15-49. Among 19,496 women aged 15-49, 6285 women were interviewed for pregnancy outcomes [10, 15].

Variables

Outcome Variable

In the CDHS, women were questioned about all pregnancy's outcomes (live births, stillbirths, miscarriages, and abortions) that occurred three years before the survey. Women were also questioned about whether they underwent pregnancy termination to identify pregnancies that ended in abortion [15]. Induced abortion was the study's outcome variable, and it was classified as either "1" (if pregnancy was ended) or "0" (if it wasn't).

Explanatory Variables

Explanatory variables were household-level variable (wealth quintile), community-level variable (urban/rural residence), maternal variables (age, education status, number of children less than 5 years, attitude toward gender-based violence and media exposure), health service variable (use of contraceptive methods), and empowerment variable (women's autonomy on decision making). Attitude toward gender based violence was measured based on beating justified if the wife goes out without telling the husband, neglects the children, argue with the husband, refused to have sex and burns food. Attitude toward gender-based violence was categorized as "good" and "poor" based on their response. Media exposure was measured based on frequency of internet use, reading newspapers, listening to the radio and watching television. Having exposure to any one of the above media was categorized as having media exposure. Likewise, women's autonomy in decision-making was measured based on decisions on health care, decision on large household purchases, decisions on family visits and decisions on husband's money. Having decision to any one of the above decisions was categorized as having women's autonomy on decision. Current use of contraceptive, had autonomous decisions, attitude toward gender-based violence, and media exposure were dichotomized into "yes" and "no" for analysis.

Statistical analysis

Analysis was performed in SPSS 21. The population estimate was obtained by weighting the reported values by the sample weight. Proportion of induced abortion among categories of characteristics of study population was computed; 95% confidence interval was also presented. Bivariate logistic regression was used to calculate unadjusted associations between induced abortion and each exploratory variable over the last 3 years. Multivariate logistic regression analysis was used to compute adjusted odds ratios for having had an abortion in the previous 3 years, with predictors accounting for other potential confounders. P-value less than 0.05 was considered statistically significant level. Model fitness was assessed by Hosmer and Lemeshow goodness of fit test ($p>0.05$). The regression model was fit with the variables entered.

Ethical consideration

The Institutional Review Board of ICF and Cambodia Health Research Ethical Review Board both granted their permission for CDHS. The CDHS datasets are accessible to the public on the DHS website. After the first author received permission from DHS/ICF International, Rockville, Maryland, USA, and the CDHS 2021-2022 datasets were made accessible for download and use. All study participants were given a pre-structured consent form to read, and the interviewer verbally got their informed consent (or, in the case of minors, assent) before recording it [10, 15].

Results

The proportion of induced abortion among women of reproductive age was 8.80% in last three years preceding the survey in Cambodia based on Survey year 2021-2022. Proportion of induced abortion was 12.9% in the women of the richest wealth quintile and 8% in the poorest wealth quintile. Low proportion (7.1%) of induced abortion was observed among women from the rural area compared to urban area which was 11.2%. Higher proportion (14.5%) of induced abortion was observed among women of aged 35-49 years; and it was 5.3% among women aged below 20 years. High proportion (27.4%) of induced abortion was found among women of reproductive age who hadn't had under five-year children. Likewise, higher proportion (9.2%) of induced abortion was seen in women who reported poor attitude toward gender-based violence. Women who had exposure to media showed high proportion (9.3%) of induced abortion compared to women who were not exposed (7%) to media **(Table 1)**.

***Table 1**: Characteristics of women of reproductive age who had an induced abortion in the last 3 years in Cambodia*

Characteristics	Un-weighted Population (N=6285)	Weighted Population (N=6156)	Number of Induced Abortion (%) (n=541)	95% CI
Wealth quintile				
Poorest	1828	1267	101 (8.0)	6.5-9.4
Poorer	1156	1117	60 (5.4)	4.0-6.7
Middle	1112	1141	96 (8.4)	6.7-10.0
Richer	1273	1331	116 (8.7)	7.2-10.0
Richest	916	1300	168 (12.9)	11.0-14.7
Type of residence**				
Urban	2188	2527	284 (11.2)	10.0-12.4
Rural	4097	3629	257 (7.1)	6.2-7.9
Age of the respondents (in years)**				
<20	289	247	13 (5.3)	2.5-8.1
20-34	4536	4366	304 (7.0)	6.2-7.7
35-49	1460	1543	224 (14.5)	12.7-16.2
Highest level of education*				
No education	770	632	48 (7.6)	5.5-9.7
Primary	2671	2507	250 (10.0)	8.8-11.1
Secondary	2497	2574	213 (8.3)	7.2-9.3
Higher	347	443	30 (6.8)	4.4-9.1
Number of under five years children**				
No child	579	656	180 (27.4)	23.9-30.8
1- 2	5449	5251	354 (6.8)	6.0-7.4
≥3	257	249	7 (2.8)	0.6-4.7
Attitude toward gender based violence				
Good	3984	3815	325 (8.5)	7.6-9.4
Poor	2301	2341	216 (9.2)	8.0-10.4
Media exposure*				
No	1504	1329	93 (7.0)	5.6-8.3
Yes	4781	4827	448 (9.3)	8.4-10.1
Current use of contraceptive**				
Not used	2447	2300	129 (5.6)	4.6-6.5
Used	3838	3856	412 (10.7)	9.7-11.6
Women's autonomy on decision making*				
Other	2124	1986	153 (7.7)	6.5-8.9
Self	3899	3908	369 (9.4)	8.5-10.3

**p value <0.05, **p value <0.001*

Factors-influencing of induced abortion in Cambodia

The outcome variable and selected explanatory factors were analyzed using bivariate and multivariate analyses. R^2 value was 0.127 which meant that approximately 12.7% of induced abortion among women of reproductive age of Cambodia was attributable to the factors included in the model. As per the adjusted analysis, the odds of induced abortion was 0.2 (AOR 0.80, 95% CI [0.63-1.02]) among rural women as compared to urban women. The odd of induced abortion among 20-34 years age was 1.46 (AOR 1.46, 95% CI [0.80-2.65]) times more likely compared with reference age group less than 20 years. Likewise, there was 2.7 (AOR 2.70, 95% CI [1.47-4.98]) times more likelihood of induced abortion among 35 above aged women compared to reference age group. Women with 1-2 children of under five years were 77% less likely to have induced abortion (AOR 0.23, 95% CI [0.18-0.28]), and those with more than three under five years children had 90% (AOR 0.10, 95% CI [0.04-0.23]) less likely to have induced abortion compared to the women who had no under five children. Women who were exposed to media had 30% (AOR 1.30, 95% CI [1.01-1.69]) more likely of having induced abortion compared to those who didn't have exposure to media. The odd of induced abortion among women of reproductive age who used any type of contraceptive methods currently was 1.96 (AOR 1.96, 95% CI [1.56-2.45]) as compared to who didn't use any type of contraceptive method for family planning.

Wealth index, age, women with children less than 5 years, status of contraceptive used, and who were exposed to media were found to be statistically significant in both bivariate and multivariate analysis. Type of residence and women who had decision power had significant association in bivariate analysis. Education status and attitude toward gender-based violence didn't show any significant association in both bivariate and multivariate analysis. **(Table 2)**

Table 2: *Factors influencing induced abortion in Cambodia (n=6156)*

Characteristics	Crude OR		Adjusted OR	
	OR (95% CI)	P-value	AOR (95% CI)	P-value
Wealth quintile				
Poorest	1		1	
Poorer	0.66 (0.47-0.91)	0.01	0.53 (0.37-0.76)	0.001
Middle	1.05 (0.78-1.41)	0.72	0.89 (0.64-1.23)	0.50
Richer	1.10 (0.83-1.45)	0.49	0.72 (0.51-1.01)	0.05
Richest	1.70 (1.31-2.21)	<0.001	1.10 (0.77-1.58)	0.56
Type of residence				
Urban	1		1	
Rural	0.60 (0.50-0.72)	<0.001	0.80 (0.63-1.02)	0.07
Age of the respondents (in years)				
<20	1		1	
20-34	1.32 (0.75-2.34)	0.32	1.46 (0.80-2.65)	0.21
35-49	3.01 (1.69-5.33)	<0.001	2.70 (1.47-4.98)	0.001
Education				
No education	1		1	
Primary	1.34 (0.97-1.84)	0.07	1.36 (0.96-1.92)	0.08
Secondary	1.09 (0.78-1.51)	0.60	1.25 (0.86-1.81)	0.22
Higher	0.87 (0.54-1.41)	0.58	0.76 (0.44-1.30)	0.32
Number of under five years children				

Characteristics	Crude OR		Adjusted OR	
	OR (95% CI)	P-value	AOR (95% CI)	P-value
No child	1		1	
1-2	0.19 (0.15-0.23)	<0.001	0.23 (0.18-0.28)	<0.001
≥3	0.07 (0.03-0.16)	<0.001	0.10 (0.04-0.23)	<0.001
Attitude toward gender-based violence				
Good	1		1	
Poor	1.09 (0.91-1.30)	0.34	1.18 (0.97-1.45)	0.09
Media exposure				
No	1		1	
Yes	1.36 (1.08-1.72)	0.009	1.30 (1.01-1.69)	0.04
Current use of contraceptive				
Not used	1		1	
Used	2.01 (1.63-2.46)	<0.001	1.96 (1.56-2.45)	<0.001
Women's autonomy on decision making				
Other	1		1	
Self	1.24 (1.02-1.51)	0.029	1.13 (0.92-1.39)	0.23

Discussion

In the study, we used data from Cambodia Demographic Health Survey conducted in 2021-2022 to examine the factor associated with induced abortion among women of reproductive age during the last three years. The study showed that 8.8% women of reproductive age 15 to 49 years reported having an induced abortion during last three years. Study found that urban residents were more likely to report having an induced abortion compared to rural dwellers in bivariate analysis. This finding was similar to the studies conducted in Ethiopia [16] and study conducted in Ghana [17]. This might be because urban women are more likely to engage in risky sexual behaviors like peer pressure, binge drinking, unprotected sex. This risky behavior may result in unintended pregnancies. Another reason may be due to the easy accessibility of abortion services in the urban areas than in the rural areas.

The study showed that women with higher age group were more likely to have induced abortion compared to those with lower age group. This finding was relevant with the findings given by the study conducted in Nepal and Tehran, Iran showed that abortion peaked among those aged 20-34 years [18, 19]. The reason for this may be that women of older age generally engage in work, and they do not want to bear child with their career growth [20].

Women who had more under 5 years children were less likely to undergo induced abortion as compared to those who didn't have under 5 children. This may indicate that they have limited access to family planning method including induced abortion services. Study conducted in Nepal stated that most of the media reported that induced abortion was used as a method of contraception in Nepal which may be the reason for having induced abortion [18]. The likelihood of having an induced abortion was lower among those who good attitude toward gender-based violence than in those who had poor attitude. This finding was similar with the study conducted in Nepal and India [21, 22]. Women who reported experiencing violence may have a higher rate of induced abortion because they may be in violent relationships and lack of control over their sexual life, which can result in unintended pregnancies and abortions [23].

Women who were exposed to media were more likely to report having induced abortion than those who were not exposed to media. In the 21st century, mainstream media has invaded every aspect of young people's lives [24]. Studies conducted in Ghana [25, 26] among adolescent girls and young women also showed that those who were exposed to mass media were more likely to self-efficacy to make abortion decision. The authors claim that there is

a correlation between women's exposure to mass media and their likelihood of exposure to "Western ideas and messages that encourage independence and greater autonomy." Additionally, information about the many places and procedures that young people can use to stop a pregnancy can be accessed by using the various channels, such as the internet, that have become ingrained in the lives of most young people [25].

Respondents who were using contraceptive methods during survey time had more likelihood of having induced abortion than those who didn't use contraception. Studies have documented significant numbers of miscarriages and unintended pregnancies resulting from contraceptive failure in both developed and developing countries [27, 28]. Nearly15% of contraceptive failures in developing countries resulted in unwanted pregnancies. The low abortion rate is due to a high reliance on highly effective methods such as hormonal therapy and sterilization. However, the introduction of modern contraceptives and the likelihood of abortion have increased over time in many developing countries [29]. The study also found that women with limited FP options and few opportunities to switch to other methods had higher abortion rates [30]. Study conducted in Ghana showed that number of respondents who had their first abortion earlier had since gained knowledge of contraceptive methods and were using them [25]. So, reason for this result may be also that women who had induced abortion started using contraceptives after abortion.

The strength of this study is that it is based on a large, nationally representative sample of both urban and rural populations. Limitation of the study was it was cross-sectional study, and casual relation cannot be established. It is based on secondary data; respondents might have a recall bias.

Conclusion

The study found that about one in ten women of reproductive age had induced abortion in last 3 years of the survey in Cambodia. Wealth quintile, women's age, number of under 5 children, current use of contraceptive and exposure to media had significant association with induced abortion. Interventions targeting young women, women in the poorest quintile, and women in rural areas can help address disproportionate access to abortion services.

Authors' contribution

Sanju Banstola contributed to the conceptualization, data acquisition and management, manuscript preparation, modification and finalization of manuscript**; Sharadha Hamal** contributed to manuscript draft review and editing **Bimala Sharma** contributed to manuscript draft review and editing, supervision and guidance

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References

[1] Cunningham FG, Leveno KJ, Bloom SL, Spong CY, Dashe JS, Hoffman BL, Casey BM, Sheffield JS. Williams, obstetrics. New York: McGraw-Hill Medical; 2014: 370-83.

[2] World Health Organization. The Prevention and management of unsafe abortion: report of a technical working group, Geneva, 12-15 April 1992. World Health Organization; 1993.

[3] Faúndes, A. Unsafe Abortion. International Encyclopedia of Public Health. 2017. 301–310. http://doi:10.1016/B978-0-12-803678-5.00001-1

[4] Adler AJ, Filippi V, Thomas SL, Ronsmans C. Quantifying the global burden of morbidity due to unsafe abortion: Magnitude in hospital-based studies and methodological issues. International Journal of Gynecology & Obstetrics. 2012 Sep;118:S65-77. doi: 10.1016/S0020-7292(12)60003-4.
[5] Jagwe-Wadda G, Moore AM, Woog V. Abortion morbidity in Uganda: evidence from two communities. Occasional report. 2006 Dec 1.
[6] World Health Organization. Key Fact on Abortion. 25 Nov 2021. Available from: https://www.who.int/news-room/fact-sheets/detail/abortion. Accessed on: 20th June, 2023.
[7] Sedgh G, Bearak J, Singh S, Bankole A, Popinchalk A, Ganatra B, Rossier C, Gerdts C, Tunçalp Ö, Johnson BR, Johnston HB. Abortion incidence between 1990 and 2014: global, regional, and subregional levels and trends. The Lancet. 2016 Jul 16;388(10041):258-67. doi: 10.1016/S0140-6736(16)30380-4.
[8] World Health Organization. Unsafe abortion: global and regional estimates of incidence of unsafe abortion and associated mortality in 2008. World Health Organization; 2011.
[9] Grimes DA, Benson J, Singh S, Romero M, Ganatra B, Okonofua FE, Shah IH. Unsafe abortion: the preventable pandemic. The lancet. 2006 Nov 25;368(9550):1908-19. doi: 10.1016/S0140-6736(06)69481-6.
[10] National Institute of Statistics: Directorate General for Health and ICF International. Cambodia Demographic and Health Survey 2021-2022. Available from: https://dhsprogram.com/pubs/pdf/FR377/FR377.pdf
[11] National Institute of Statistics: Directorate General for Health and ICF International. Cambodia Demographic and Health Survey 2014. Available from: https://dhsprogram.com/pubs/pdf/fr312/fr312.pdf
[12] Gebremedhin M, Semahegn A, Usmael T, Tesfaye G. Unsafe abortion and associated factors among reproductive aged women in Sub-Saharan Africa: a protocol for a systematic review and meta-analysis. Systematic reviews. 2018 Dec;7:1-5. doi: 10.1186/s13643-018-0775-9
[13] Amhare AF, Alemayehu DG, Bogale AA. Factors Associated with Unsafe Induced Abortion among Women who attended Fitche Hospital, Oromia, Ethiopia: Cross-sectional study. 2019.
[14] Alio AP, Nana PN, Salihu HM. Spousal violence and potentially preventable single and recurrent spontaneous fetal loss in an African setting: cross-sectional study. The Lancet. 2009 Jan 24;373(9660):318-24. doi: 10.1016/S0140-6736(09)60096-9
[15] The Demographic and Health Survey. Available from: https://dhsprogram.com/data/availabledatasets.cfm?fbclid=IwAR0VdieHcQ_r89tfHWH5tpTxqd0v0GYnqeOMio5BnzhlYB5BKvQIy8j-Vkg. Accessed on: 12th May, 2023
[16] Nigussie T, Feyisa M, Yosef T, Berhanu M, Asefa A. Prevalence of induced abortion and its associated factors among female students of health science in South West Ethiopia. The Open Nursing Journal. 2020 Nov 26;14(1). doi: 10.2174/1874434602014010248
[17] Mote CV, Otupiri E, Hindin MJ. Factors associated with induced abortion among women in Hohoe, Ghana. African journal of reproductive health. 2010;14(4).
[18] Mehata S, Menzel J, Bhattarai N, Sharma SK, Shah M, Pearson E, Andersen K. Factors associated with induced abortion in Nepal: data from a nationally representative population-based cross-sectional survey. Reproductive Health. 2019; 16:68. https://doi.org/10.1186/s12978-019-0732-7
[19] Erfani A. Induced abortion in Tehran, Iran: estimated rates and correlates. International perspectives on sexual and reproductive health. 2011 Sep 1:134-42. doi: 10.1363/3713411
[20] Agrawal S. Determinants of Induced Abortion and Its Consequences on Women's Reproductive Health: Findings from India's National Family Health Surveys. Macro International; 2008.
[21] Thakuri DS, Ghimire PR, Poudel S, Khatri RB. Association between intimate partner violence and abortion in Nepal: a pooled analysis of Nepal demographic and health surveys (2011 and 2016). BioMed Research International. 2020 Aug 31;2020. https://doi.org/10.1155/2020/5487164
[22] Dhar D, McDougal L, Hay K, Atmavilas Y, Silverman J, Triplett D, Raj A. Associations between intimate partner violence and reproductive and maternal health outcomes in Bihar, India: a cross-sectional study. Reproductive health. 2018 Dec;15:1-4. doi: 10.1186/s12978-018-0551-2
[23] Pallitto CC, García-Moreno C, Jansen HA, Heise L, Ellsberg M, Watts C. Intimate partner violence, abortion, and unintended pregnancy: results from the WHO Multi-country Study on Women's Health and Domestic Violence. International Journal of Gynecology & Obstetrics. 2013 Jan 1;120(1):3-9. doi: 10.1016/j.ijgo.2012.07.003
[24] Grewal D, Hulland J, Kopalle PK, Karahanna E. The future of technology and marketing: A multidisciplinary perspective. Journal of the Academy of Marketing Science. 2020 Jan; 48:1-8. https://doi.org/10.1007/s11747-019-00695-1
[25] Ahinkorah BO, Seidu A-A, Mensah GY, Budu E (2020) Mass media exposure and self-efficacy in abortion decision-making among adolescent girls and young women in Ghana: Analysis of the 2017 Maternal Health Survey. PLoS ONE 15(10): e0239894. https://doi.org/10.1371/journal.pone 0239894
[26] Owoo NS, Lambon-Quayefio MP, Onuoha N. Abortion experience and self-efficacy: exploring socioeconomic profiles of GHANAIAN women. Reproductive health. 2019 Dec;16(1):1-3. https://doi.org/10.1186/s12978-019-0775-9
[27] Shah, I., Ahman, E. Unsafe abortion in 2008: global and regional levels and trends. Reproductive Health Matters. 2010: 18(36):90–101. doi: 10.1016/S0968-8080(10)36537-2
[28] Singh S, Remez L, Sedgh G, Kwok L, Onda T. Abortion worldwide 2017: uneven progress and unequal access. 2018.
[29] Cleland J, Ali MM. Reproductive consequences of contraceptive failure in 19 developing countries. Obstetrics & Gynecology. 2004 Aug 1;104(2):314-20. doi: 10.1097/01. AOG 0000134789.7366
[30] Black KI, Gupta S, Rassi A, Kubba A. Why do women experience untimed pregnancies? A review of contraceptive failure rates. Best Practice & Research Clinical Obstetrics &Gynaecology. 2010 Aug 1;24(4):443-55. doi: 10.1016/j.bpobgyn.2010.02.002