

## Knowledge and Perception of Accidental Falls in Pregnancy among Women of Child-Bearing Age in Southwest Nigeria

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### Abstract

Accidental falls occur commonly during pregnancy. Evidence has shown that awareness and risk perception can influence prevention of health risks, including falls, during pregnancy. However, there are no fall risk assessment and prevention guidelines in Nigeria. A self-reported survey of 745 women from four public health facilities in Ado – Ekiti was employed to obtain information about knowledge and perception of maternal fall risk. Fall rate was 26%, and its occurrence was predicted by the women's perception of their risk of falling (adjusted odds ratio: 0.395; 95% C. I. 0.19 – 0.81;  $p = 0.017$ ). The perception of the women about accidental maternal falls was significantly poorer amongst the women who were rural-dwellers ( $\chi^2 = 10.26$ ;  $p = 0.001$ ), unskilled workers ( $\chi^2 = 22.48$ ;  $p < 0.001$ ), had no more than a secondary education ( $\chi^2 = 29.95$ ;  $p < 0.001$ ), and were in the lower- and middle-socioeconomic classes (III - V) ( $\chi^2 = 24.22$ ;  $p < 0.001$ ). The women's knowledge of accidental falls during pregnancy was predicted by their occupation ( $\chi^2 = 13.68$ ;  $p = 0.03$ ) and socioeconomic class ( $\chi^2 = 20.38$ ;  $p = 0.01$ ). Fall awareness campaigns using effective risk communication models that can shape maternal perception of their fall risks should be promoted in women's clinics.

### Introduction

Pregnancy-related falls are a common occurrence [1]. These present a unique challenge because two patients need to be considered, the mother and the fetus.

After motor vehicular accidents, accidental falls in pregnancy rank as the leading cause of trauma-associated visits by pregnant women to the emergency department or hospital admissions. Generally, the rate of falls during pregnancy (27%) is similar to what obtains in women above the age of 70 (28%), thus they are the most common cause of non-obstetric injuries in pregnant women [2-6]. Maternal injuries following falls in pregnancy could include joint sprains, muscular strains, fractures, ruptured viscera, including the uterus, and occasionally, death. Other complications include placental separation, rupture of the fetal membranes, or fetal death [3, 7-10].

In other to prevent these falls and their possible complications, there must be a logical balancing of the real risk of maternal falls and the perceived risks by the women themselves [11]. Risk perception is the composite manner by which individuals judge and evaluate the risks they might be exposed to [12], and this strongly influences the decisions pregnant women make about prenatal care and the options of care they seek in high-risk gestations [13]. Thus, maternal rating of the risks they face from accidental falls may vary from the assessments by the health care providers.

Although falls during pregnancy have assumed a public health dimension, there are no studies on maternally perceived risks of accidental falls in Nigeria, and no falls-risk assessment or preventive guidelines. This study has been designed to close this information gap, and provide a basis for campaigns on prevention of accidental falls during pregnancy.

### Method

This health facility-based, multicentre, cross-sectional cohort survey of women of childbearing age was conducted within Ado – Ekiti, the capital city of Ekiti State, southwest Nigeria, between February and March, 2019. Ado – Ekiti has a population of 2,398,957, who are mostly Yoruba-speaking Christians, and facilities providing maternal and child health services across the different tiers of healthcare [14].

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Four public health centres were selected for this survey because of their adequate geographical spread across the capital, and the population of clients that were cared for. These are: (i) Ekiti State University Teaching Hospital, Adebayo, Ado – Ekiti, (ii) Comprehensive Health Centre, Okeyinmi, Ado – Ekiti, (iii) Basic Health Centre, Irona, and (iv) Basic Health Centre, Odo – Ado. They receive clients from the capital, other towns in Ekiti State, and from neighbouring Ondo, Kogi, and Osun states.

Case definition: Accidental fall was defined as a loss of balance during pregnancy in which a part of the body, besides the feet, touched the ground. All women within the childbearing ages (15- 49 years) who attended the maternal and child health clinics at the study locations during the survey duration, and who gave consent were interviewed. During the routine health education of the women, the purpose of the survey was explained to them, and semi-structured questionnaires were handed out to the consenting mothers. They were informed that though their responses would be held in confidence, they could opt-out.

The survey instrument was developed as an adaptation of other validated instruments for injury study [6, 15], and written in English, the official language of Nigeria. After pretesting, it was also decoded into Yoruba, to improve its comprehensibility. It enquired about the social and demographic characteristics of the respondents, including age, area of residence, occupation, marital status, parity, partner’s occupation, level of education and religion. The socioeconomic class was calculated after the model by Olusanya *et al*, with I being the highest and V the least [16]. In other to fulfil the study’s objectives, three blocks of questions were asked relating to *perception* of accidental maternal falls, *complications* that may occur after a fall, and when to *seek medical help* after a fall in pregnancy. The self-reported questionnaires were then retrieved by the trained assistants, perused for completeness, and further inquiries made from the respondents if necessary. Where missing values occurred, the mean or modal values (whichever was appropriate) were imputed. The respondents were also asked if they had a fall in their previous pregnancies.

The three blocks of questions were designed in a Likert-scale fashion with five options, ‘strongly agree,’ ‘agree,’ ‘don’t know,’ ‘disagree,’ and ‘strongly disagree.’ Each was assigned a numerical value of +2, +1, 0, -1, and -2 respectively. Thus, the total score for the responses on perception was 8; good perception was  $\geq 6$ , while poor perception was  $< 6$ . The total score for the questions on knowledge was 24;  $\geq 20$  was regarded as good knowledge, 12 – 19 fair knowledge, and  $\leq 11$  poor knowledge.

Ethical approval for the survey was given by the Ethics and Research Committee of the Ekiti State University Teaching Hospital, Ado – Ekiti, and the National Primary Health Care Development Agency, Ekiti State.

The retrieved data was coded into, and analysed using the Statistical Software for the Social Sciences (SPSS) package version 20. Responses were expressed using descriptive statistics, while chi-square and regression analyses were done for inferential purposes, with level of significance set at  $p < 0.05$ .

## Results

Of the 745 questionnaires distributed to the women, nine

(1.2%) were returned by women who decided to opt-out of the survey, while 2 (0.3%) were excluded because they were filled by women who were no longer in the childbearing years. Thus, the data analysis was based on 734 (98.5%) respondents. The mean age of the respondents was  $30.2 \pm 5.0$ . One hundred and ninety-one women reported at least a fall in their erstwhile pregnancy, giving a fall rate of 26%.

Seven hundred and three (95.8%) respondents were between the ages of 20 and 39 years, while 5 (0.7%) were teenagers. Most of the respondents were urban dwellers 485 (66.1%), unskilled workers 278 (37.9%), and married 706 (96.2%) multiparous 482 (65.7%) women. About two-thirds (66.5%) were educated to the tertiary level, with 440 (59.9%) being in the middle and lower socioeconomic classes (Table 1).

From Table 2, the perception of the women about accidental maternal falls was significantly poorer amongst the women who were rural-dwellers ( $\chi^2 = 10.26$ ;  $p = 0.001$ ), unskilled workers ( $\chi^2 = 22.48$ ;  $p < 0.001$ ), had no more than a secondary education ( $\chi^2 = 29.95$ ;  $p < 0.001$ ), and were in the lower- and middle-socioeconomic classes (III - V) ( $\chi^2 = 24.22$ ;  $p < 0.001$ ).

The women’s knowledge of accidental falls during pregnancy

Table 1: The sociodemographic characteristics of the respondents.

Characteristics	Frequency	Percentage
<b>Age (years)</b>		
$\leq 19$	5	0.7
20 – 29	312	42.5
30 – 39	391	53.3
$\geq 40$	26	3.5
<b>Residence</b>		
Rural	249	33.9
Urban	485	66.1
<b>Occupation</b>		
Unemployed	65	8.9
Unskilled	278	37.9
Semi-skilled	219	29.8
Skilled	172	23.4
<b>Marital status</b>		
Single	28	3.8
Married	706	96.2
<b>Parity</b>		
1	252	34.3
$\geq 2$	482	65.7
<b>Religion</b>		
Christianity	649	88.4
Islam	85	11.6
<b>Level of Education</b>		
No formal	8	1.1
Primary	26	3.5
Secondary	212	28.9
Tertiary	488	66.5
<b>Socioeconomic class</b>		
I	105	14.3
II	189	25.7
III	245	33.4
IV	177	24.1
V	18	2.5

**Table 2:** Relationship between respondents' perception of falls and their sociodemographic characteristics.

Characteristics	Perception about falls		χ <sup>2</sup>	df	p value
	Poor	Good			
<b>Age (years)</b>					
≤ 19	4 (80)	1 (20)	0.73	3	0.867
20 – 29	282 (90.4)	30 (9.6)			
30 – 39	350 (89.5)	41 (10.5)			
≥ 40	23 (88.5)	3 (11.5)			
<b>Residence</b>					
Rural	236 (94.8)	13 (5.2)	10.26	1	0.001*
Urban	423 (87.2)	62 (12.8)			
<b>Occupation</b>					
Unemployed	61 (93.8)	4 (6.2)	22.48	3	<0.0001*
Unskilled	258 (92.8)	20 (7.2)			
Semi-skilled	202 (92.2)	17 (7.8)			
Skilled	138 (80.2)	34 (19.8)			
<b>Marital status</b>					
Single	27 (96.4)	1 (3.6)	1.40	1	0.236
Married	632 (89.5)	74 (10.5)			
<b>Parity</b>					
1	223 (88.5)	29 (11.5)	0.70	1	0.404
≥ 2	436 (90.5)	46 (9.5)			
<b>Religion</b>					
Christianity	579 (89.2)	70 (10.8)	1.97	1	0.160
Islam	80 (94.1)	5 (5.9)			
<b>Education</b>					
No formal	8 (100)	0 (0)	29.95	3	<0.0001*
Primary	25 (96.2)	1 (3.8)			
Secondary	209 (98.6)	3 (1.4)			
Tertiary	417 (85.5)	71 (14.5)			
<b>Socioeconomic class</b>					
I	93 (88.6)	12 (11.4)	24.22	4	<0.0001*
II	159 (84.1)	30 (15.9)			
III	215 (87.8)	30 (12.2)			
IV	175 (98.9)	2 (1.1)			
V	17 (94.4)	1 (5.6)			

\*significant at p < 0.05

was predicted by their occupation ( $\chi^2 = 13.68$ ; p = 0.03) and socioeconomic class ( $\chi^2 = 20.38$ ; p = 0.01) (Table 3).

Table 4 showed the relationship between the knowledge and perception of the respondents and their actual experience of falling in their erstwhile pregnancy. Women with good perception scores about accidental maternal falls were significantly less likely to have fallen during their pregnancies (adjusted odds ratio: 0.395; 95% C. I. 0.19 – 0.81; p = 0.017).

## Discussion

The fall rate identified from this survey was 26%. This is in-keeping with the figures quoted by studies from south-eastern Nigeria (32.5%) [17], and other parts of the world [1, 6, 18]. Thus, it is clear that accidental maternal falls are issues of public health importance in Nigeria. Efforts at prevention are already long overdue.

Our survey found that accidental falls during pregnancy was significantly predicted by having a poor perception about the risks of maternal falls. Risk perception has been found to be a cardinal component of many theories on health behaviour

**Table 3:** Relationship between respondents' knowledge of falls in pregnancy and their sociodemographic variables.

Characteristics	Knowledge of falls			χ <sup>2</sup>	df	p value
	Poor	Fair	Good			
<b>Age (years)</b>						
≤ 19	4 (80)	1 (20)	0 (0)	3.76	6	0.71
20 – 29	245 (78.5)	49 (15.7)	18 (5.8)			
30 – 39	301 (77)	72 (18.4)	18 (4.6)			
≥ 40	18 (69.2)	5 (19.2)	3 (11.5)			
<b>Residence</b>						
Rural	190 (76.3)	45 (18.1)	14 (5.6)	0.25	2	0.88
Urban	378 (77.9)	82 (16.9)	23 (5.2)			
<b>Occupation</b>						
Unemployed	54 (83.1)	9 (13.8)	2 (3.1)	13.68	6	0.03*
Unskilled	221 (81.7)	43 (15.5)	8 (2.9)			
Semi-skilled	168 (76.7)	37 (16.9)	14 (6.4)			
Skilled	119 (69.2)	38 (22.1)	15 (8.7)			
<b>Marital status</b>						
Single	24 (85.7)	4 (14.3)	0 (0)	1.96	2	0.38
Married	544 (77.1)	123 (17.4)	39 (5.5)			
<b>Parity</b>						
1	202 (80.2)	37 (14.7)	13 (5.2)	1.92	2	0.38
≥ 2	341 (75.1)	87 (19.2)	26 (5.7)			
<b>Religion</b>						
Christianity	499 (76.9)	113 (17.4)	37 (5.7)	1.80	2	0.41
Islam	69 (81.2)	14 (16.5)	2 (2.4)			
<b>Education</b>						
No formal	8 (100)	0 (0)	0 (0)	12.05	6	0.06
Primary	19 (73.1)	6 (23.1)	1 (3.8)			
Secondary	179 (84.4)	26 (12.3)	7 (3.3)			
Tertiary	362 (74.2)	95 (19.5)	31 (6.4)			
<b>Socioeconomic class</b>						
I	73 (69.5)	27 (25.7)	5 (4.8)	20.38	8	0.01*
II	135 (71.4)	40 (21.2)	14 (7.4)			
III	200 (81.6)	32 (13.1)	13 (5.3)			
IV	149 (84.2)	22 (12.4)	6 (3.4)			
V	11 (61.1)	6 (33.3)	1 (5.6)			

\*significant at p < 0.05

**Table 4:** Regression analysis of accidental falls in pregnancy and respondents' knowledge and perception of falls.

Variables	Fell during pregnancy		Adjusted OR	95% C. I.	p value
	Yes	No			
<b>Knowledge of falls in pregnancy</b>					
Poor	152 (26.8)	416 (73.2)	1.00		
Fair	28 (22)	99 (78)	0.83	0.51 – 1.35	0.444
Good	11 (28.2)	28 (71.8)	1.31	0.60 – 2.83	0.496
<b>Perception about falls in pregnancy</b>					
Poor	179 (27.2)	480 (72.8)	1.00		
Good	12 (16)	63 (84)	0.395	0.19 – 0.81	0.017*

\*significant at p < 0.05

including the Health Belief Model [13, 19]. Perception influences the health-seeking behaviour and uptake of prenatal services among pregnant mothers [20]. Thus, having such perceptions as the notion that supernatural and diabolical forces could influence pregnancy outcomes, could make mothers seek spiritual help rather than formal medical attention when they have complications [19].

Poor perception of the riskiness of maternal falls was, in turn, predicted by having no more than a secondary education. Pregnant women contextualize health recommendations about falls, and have their own views about its riskiness [21]. These views are determined by the level of their academic exposure, and culture [13] especially for the rural dwellers, who were also more likely to occupy the lower- and middle-socioeconomic classes. Reshaping maternal perceptions about the riskiness of accidental falls could be achieved through effective risk communication methods which can be understood with minimal cognitive effort, and addressing myths/misconceptions about maternal falls for the benefit of the rural dwellers.

Women who were skilled workers and in the upper socioeconomic classes were significantly more aware of accidental maternal falls from this study. Although these groups of respondents were more likely to have higher education, the level of education was not a significant predictor of the knowledge of maternal falls from our survey. Thus, more education may not always translate to more awareness of health risks [22].

The selection of facility-based respondents could bias this survey. However, its strengths derive from the use of geographically-diverse centres, and the participation of childbearing women from various societal strata within the state.

In conclusion, at least one in four mothers fall during pregnancy in our environment. Women who had a poor perception of their risks of accidental falls were more likely to have fallen during pregnancy. Rural dwellers, with at most a secondary education, and unskilled workers, in the lower- and middle-socioeconomic classes were significantly more likely to have a poor perception of their risks of falling; while fall awareness was more amongst skilled women in the upper classes. Scaling up fall awareness campaigns using effective risk communication models that can shape maternal perception of their fall risks is advised.

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## Conflict Of Interest

The authors declare no competing interests concerning this work.

## References

1. McCrory J, Chambers A, Daftary A, Redfern M. Dynamic postural stability in pregnant fallers and non-fallers. *BJOG*. 2010;117:954-962.
2. Tinker SC, Reefhuis J, Dellinger AM, Jamieson DJ. National Birth Defects Prevention Study (2010) Epidemiology of maternal injuries during pregnancy in a population-based study, 1997 – 2005. *J Womens Health (Larchmt)*. 2010;19: 2211-2218.
3. Weiss HB, Songer TJ, Fabio A. Fetal deaths related to maternal injury. *JAMA*. 2001;286:1863-1868.
4. Kuo C, Jamieson DJ, McPheeters ML, Meikle SF, Posner SF. Injury hospitalizations of pregnant women in the United States, 2002. *Am J Obstet Gynecol*. 2007;196(2):161:e1-e6.
5. Brown HL. Trauma in pregnancy. *Obstet Gynecol*. 2009;114(1):147-160.
6. Dunning K, Lemasters G, Bhattacharya A. A major public health issue: The high incidence of falls during pregnancy. *Matern Child Health J*. 2010;14(5):720-725.
7. El Kady D. Perinatal outcomes of traumatic injuries during pregnancy. *Clin Obstet Gynecol*. 2007;50(3):582-591.
8. El Kady D, Gilbert WM, Anderson J, Danielsen B, Towner D, Smith LH. Trauma during pregnancy: An analysis of maternal and fetal outcomes in a large population. *Am J Obstet Gynecol*. 2004;190(6):1661-1668.
9. Fildes J, Reed L, Jones N, Martin M, Barrett J. Trauma: the leading cause of maternal death. *J Trauma*. 1992;32(5):643-645.
10. Dyer I, Barclay D. Accidental trauma complicating pregnancy and delivery. *Am J Obstet Gynecol*. 1962;83: 907-929.
11. Rothman BK. Pregnancy, birth and risk: an introduction. *Health, Risk and Society*. 2014;16 (1):1-6.
12. Finucane ML, Holup JL. Risk as value: Combining affect and analysis in risk judgments. *Journal of Risk Research*. 2006;9(2):141-164.
13. Taghizadeh Z, Cheraghi MA, Kazemnejad A, Pooralajal J, Aghababaei S. Difference in perception of pregnancy risk in two maternal age groups. *J Clin Diagn Res*. 2017; 11(5):QC09-QC12.
14. National Population Commission (NPC). 2006 Population and Housing Census Priority Tables, vol 4. National Population Commission (NPC), Abuja, Nigeria.2010.
15. Department of Labor (United States). Bureau of labor statistics work injury report – falls from elevations. Appendix C survey questionnaire BLS 98E. 1992;17- 20.
16. Olusanya O, Okpere E, Ezimokhai E. The importance of social class in voluntary fertility control in developing countries. *W Afr J Med*. 1985;4:205-207.
17. Okeke TC, Ugwu EO, Ikeako LC, et al. Falls among pregnant women in Enugu, southeast Nigeria. *Niger J Clin Pract*. 2014;17(3): 292-295.
18. Dunning K, LeMasters G, Levin L, Bhattacharya A, Alterman T, Lordo K. Falls in workers during pregnancy: risk factors, job hazards and high risk occupations. *Am J Ind Med*. 2003;44(6):664-672.
19. Akeju DO, Oladapo OT, Vidler M, et al. Determinants of health care seeking behaviour during pregnancy in Ogun State, Nigeria. *Reproductive Health*. 2016;13(Suppl 1): 32.
20. Qureshi RN, Sheikh S, Khowaja AR, et al. Health care seeking behaviours in pregnancy in rural Sindh, Pakistan: a qualitative study. *Reproductive Health*. 2016;13 (Suppl 1):34.
21. Hammer R, Inglin S. 'I don't think it's risky, but ...': pregnant women's risk perceptions of maternal drinking and smoking. *Health, Risk and Society*. 2014;16 (1): 22-35.
22. Abiodun OA, Fatungase OK, Olu-Abiodun OO. Knowledge, perception and predictors of uptake of cervical screening among rural Nigerian women. *J Public Health Epidemiol*. 2014; 6(3):119-124.