

# Knowledge and Practice of Seat Belt Use among Pregnant Women

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**Aim:** Our study aims to determine the prevalence of seatbelt use in pregnancy and associated factors of the correct seat belt use.

**Materials and methods:** This is a cross-sectional survey of the pregnant women who presented to the antenatal clinic of a tertiary medical center for 12 months. Patients were selected by using a systematic random sampling method. Face-to-face interview by trained interviewers was done to collect data, based on 11 questions survey. Participants' knowledge on correct placement of both the lap and shoulder belt was assessed using a representative diagram.

**Results:** Eighty pregnant women participated in the interview. Their mean age was 30 ( $\pm$  3.85) years old, 76.3% of them attained post-secondary school education, and the majority (68.8%) was multigravida. Only 20 (25%) women knew the correct use of the seatbelt. There were no significant associations between knowing the correct use of seatbelt with the women's age ( $p = 0.18$ ), educational level ( $p = 0.10$ ), gravidity ( $p = 0.21$ ), gestation ( $p = 0.44$ ) and status of ever receive information on seatbelt usage ( $p = 0.07$ ). The highest source of information was from printed materials

A total of 66 (82.5%) women drove during pregnancy and 74 (92.5%) were passengers. Six of the participants were neither a driver nor a passenger as they were public transport users. More than half (57.6%) of the drivers will always use a seatbelt, but only 43.2% will always use a seatbelt when they were passengers. More than 80% of those who did not always wear a seatbelt either as drivers or passengers stated feeling uncomfortable as a reason for noncompliance.

**Conclusion:** There is lacking in awareness of the importance and correct seat belt use in pregnancy among the pregnant women. Steps should be taken to increase the correct usage of seatbelts to reduce maternal and fetal mortality due to road traffic accidents.

**Keywords:** Accident, Antenatal, Car, Car restraint, Pregnancy, Seat belt.

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## INTRODUCTION

Road traffic accidents continue to be a major contributor to worldwide morbidity and mortality.<sup>1</sup>

About 1.5–3.8% of road traffic accidents involving pregnant women<sup>2</sup> and up to 3% of pregnant women experience crashes during pregnancy.<sup>3</sup> It has been shown that wearing a seat belt correctly can save lives. The previous study has shown that the mortality rate in pregnant women not wearing a seat belt is double that of those not using one.<sup>4</sup> Pregnant women who were thrown from the car in road traffic accidents, may the interior object of the vehicle or the pavement once ejected. Therefore the mortality rate for those who were ejected from the vehicle was 33% compared to 5% who were not ejected. The adoption of the three-point seat belt has managed to reduce the death rate by 45% and moderate critical injuries by 50%.<sup>5</sup> This is reflected in current legislation in some countries, which make their use compulsory.

Road traffic accidents are the leading cause of fetal death associated with maternal trauma<sup>6</sup>, mainly due to the death of pregnant women.<sup>4</sup> When the mother was ejected from the car, the fetal mortality was 47% compared to 11% when the mother remained in the car. Studies also found that there is a reduction in risk of experiencing adverse fetal outcomes when a pregnant woman uses a seat belt properly.<sup>7,8</sup> Fetal survival was improved if a three-point seat belt usage rather than a lap belt alone was worn.<sup>4,9</sup> Seat belt worn inappropriately has been reported to cause harm.<sup>10</sup>

Despite their demonstrated effectiveness, the use of seat belt varies widely. One report in the United Kingdom revealed that only 13% of pregnant women wear their seat belt in the correct position as prescribed by the National Highway Traffic Safety Administration (NHTSA) guidance. Other study found incorrect placement rate of 52% during pregnancy.<sup>11</sup> Further, Hammond et al.<sup>12</sup> found only 77.6% of interviewed wore the seat belt correctly.

It has been shown that, if pregnant women were involved in a road traffic accident, they are likely to be in the car as a passenger or a driver, rather than to be a bicyclist or

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pedestrian struck by a car as compared to the nonpregnant women.<sup>2</sup> Therefore, it is important for us to study the use of a seat belt in the pregnant woman. This study aims to determine the prevalence of seat belt use in pregnancy and associated factors of the correct seat belt use.

## MATERIALS AND METHODS

This is a cross-sectional survey of the pregnant women who presented to the antenatal clinic of a tertiary medical center from July 2015 until August 2015. Sample size estimation for this study was calculated based on the published data by Acar et al.,<sup>13</sup> who reported the prevalence of seat belt usage during pregnancy was 13%. By taking  $\alpha = 0.05$  and 80% power of the study, using OpenEpi software, the sample size estimation was 80.

Patients were selected by using a systematic random sampling method and were given information sheets, and informed consent was taken from those who volunteered to participate. Data was collected by face to face interview by trained interviewers based on 11 questions survey. The questionnaire includes inquiries on the frequency of seat belt use in pregnancy either as a driver or a passenger, the reason of not using a seat belt (if applicable), whether the advice was given pertaining to seat belt practice in pregnancy and source of information. Participants knowledge on correct placement of both the lap and shoulder belt was assessed using a representative diagram.

The data were entered and analyzed using the statistical package for social science version 20.0 (SPSS Inc, Chicago, IL). Descriptive data were presented in the form of absolute number and percentage while inferential statistics were calculated using independent t-test and chi-square with significance level taken at 0.05.

## Ethical and Humane Considerations

Ethical approval was obtained from the Universiti Teknologi MARA (UiTM) Ethics Committee (Reference no. REC/111/15).

## RESULTS

Eighty pregnant women participated in the interview. Their mean age was 30 ( $\pm 3.85$ ) years old, 76.3% of them attained postsecondary school education, and the majority (68.8%) was multigravida. Only 20 (25%) women knew the correct use of the seat belt. There were no significant associations between knowing the correct use of seat belt with the women's age ( $p = 0.18$ ), educational level ( $p = 0.10$ ), gravidity ( $p = 0.21$ ), gestation ( $p = 0.44$ ) and status of ever received information on seat belt usage ( $p = 0.07$ ). The highest source of information was from printed materials (Table 1).

A total of 66 (82.5%) women drove during pregnancy and 74 (92.5%) were passengers. Six of the participants were neither a driver nor a passenger as they were public transport users. More than half (57.6%) of the drivers will

**Table 1:** Factors associated with the correct use of seat belt during pregnancy and source of information on seat belt use

	Total (n = 80)	Correct use (n = 20)		Wrong use (n = 60)		$X_2$ (df)	p value
	n (%)	n	%	n	%		
<i>Education level</i>							
Primary/secondary	19 (23.8)	5	25.0	14	23.3	0.23 (1)	0.10
Postsecondary	61 (76.3)	15	75.0	46	76.7		
<i>Gravidity</i>							
Primigravida	25 (31.3)	4	20.0	21	35.0	1.57 (1)	0.21
Multigravida	55 (68.8)	16	80.0	39	65.0		
<i>Gestation</i>							
First/second trimester	38 (47.5)	11	55.0	27	45.0	0.60 (1)	0.44
Third trimester	42 (52.5)	9	45.0	33	55.0		
<i>Received information</i>							
Yes	20 (25)	8	40.0	12	20.0	3.20 (1)	0.07
No	40 (75)	12	60.0	48	80.0		
Mean age (years)	30.3 $\pm$ 3.85	31.3 $\pm$ 3.9		29.9 $\pm$ 4.1		1.35* (78)	0.18
<i>Source of information (multiple responses)</i>							
Friends and relatives	8 (24.2)						
Healthcare personnel	4 (12.1)						
Mass media	7 (21.2)						
Printed material	11 (33.3)						
Others	3 (9.1)						
Total response	33						

\*Independent t-test

**Table 2:** Practice of seat belt use among women who drive (*n* = 66) and as a passenger (*n* = 74)

	As a driver, <i>n</i> (%) ( <i>n</i> = 66)	As a passenger, <i>n</i> (%) ( <i>n</i> = 74)
<i>Driving frequency</i>		
Everyday or almost everyday	47 (71.2)	31 (41.9)
A few days a week	14 (21.2)	35 (47.3)
A few days a month	5 (7.6)	8 (10.8)
<i>Use of seat belt</i>		
Always (100%)	38 (57.6)	32 (43.2)
Usually (>75%)	6 (9.1)	17 (23.0)
Sometimes (50–74%)	14 (21.2)	11 (14.9)
Rarely (25–49%)	4 (6.1)	6 (8.1)
Never (<25%)	4 (6.1)	8 (10.8)
<i>Reasons for lack of seat belt use</i>		
	( <i>n</i> = 28)	( <i>n</i> = 42)
Uncomfortable/inconvenience	24 (85.7)	34 (81.0)
Not necessary for safety in a short trip	4 (14.3)	8 (19.0)

always use a seat belt, but only 43.2% will always use a seat belt when they were passengers. More than 80% of those who did not always wear a seat belt either as drivers or passengers stated feeling uncomfortable as a reason for noncompliance (Table 2).

## DISCUSSION

It has been a known fact that the use of a seat belt is able to reduce death and critical injury caused by road traffic accidents. This is applicable for the general public including the pregnant women. Alarming, our study found low compliance of seat belt use among pregnant women when traveling in a motor vehicle as either a driver or a passenger. Among those who drove (*n* = 66, 83%), self-reported compliance to seat belt use is 57.6%. The low compliance to the seat belt use is worrying as it has been shown that the majority of pregnant women who involved in motor vehicle accident were seated in the front seats, as the driver or the front passenger.<sup>8</sup> There was a wide range of rates of compliance on seat belt use as a driver has been reported in previous studies, ranging from 49–98%.<sup>14–16</sup> In addition, this study also found low self-reported compliance on seat belt use as a passenger (43%). This is significantly lower than the finding reported by Jamjute et al. which was 78.5%.<sup>14</sup>

One of the potential reasons that contributed to the wide range of compliance on seat belt use among pregnant women is the difference in national legislation between countries and its enforcement. Ichikawa et al. found a similar compliance rate of 42%. They also found that there was a reduction in compliance of using seat belt during pregnancy from before pregnancy among the studied group.<sup>17</sup> The pertinent similarity that may explain the similarly low compliance rate was that our

local legislators are similar in term of there is flexibility given to pregnant women to be exempt from wearing a seat belt. This is further supported by a report from Center for Disease Control in the United States that the prevalence of wearing a seat belt is 85%, and it is lower in states without law enforcement measures.<sup>18</sup>

Another factor that may contribute to the varying compliance rate is the education level. It has been found to be a predictor for seat belt use, with the high school graduate more likely to use seat belt than those who received less than a high school education.<sup>15</sup> This pattern was also found in a study by Taylor et al. when comparing pregnant women in a county clinic that were generally less educated against a group of pregnant women that were generally more educated attending private practice clinic. The compliance rate is 49% and 83%, respectively.<sup>16</sup> Interestingly, despite having a majority (76.3%) of women in our study with tertiary education level, the compliance rate remained low. Therefore, education level alone may not be a good predictor for compliance on seat belt use in pregnancy in our population.

Similar with the previous studies,<sup>2,15,17,19</sup> the main reason given for noncompliance on the seat belt use in this study was that the women felt uncomfortable wearing it. The other reason given was they felt that seat belt use was unnecessary for short trips. Looking at all the reasons given, it is clear that if the women are given adequate knowledge on the importance, benefits and the correct way of using seat belt during pregnancy, their compliance will improve. In other studies, reasons given for noncompliance include fear of harming the fetus and knowing that pregnant women were exempted from seat belt use,<sup>17</sup> which we did not find in our study. We have no clear explanation for this.

Our study also found there were only 20 (25%) women who knew the correct way of using a seat belt in pregnancy. This is lower compared to previously reported in other studies of between 47–83%.<sup>2,15,17,19</sup> This is worrying as it indicated a significant number of pregnant women wearing seat belt did not wear it properly. Hence, it can cause more harm to the fetus and the pregnant women themselves if they become involved with a road traffic accident.

The previous study has found a significant positive association incorrect placement of the seat belt between those that recalled receiving advice or information.<sup>15</sup> As our study only found 20 (25%) women received information pertaining to seat belt use in pregnancy, then it is not surprising that the knowledge and understanding of the correct placement of seat belt in pregnancy are low. This is comparable with results from previous studies that reported only 22–28% of women received advice on this.<sup>14,16</sup> Some women obtained the informa-

tion from more than one source. Unfortunately, in this study, only 12.1% received information from healthcare personnel such as doctors or nurses, who were supposed to be the most reliable source of information. Regular contact during routine antenatal visits between healthcare professionals and pregnant women should be the best opportunity to educate them on correct seat belt use in pregnancy. Healthcare professionals must take important role and responsibilities in imparting crucial information pertaining seat belt use to the antenatal women. Further, education for the general public should also be emphasized, as it was shown that those women who always wear a seat belt before pregnancy would continue to do so when they are pregnant.<sup>20</sup> However, education during pregnancy remained essential, as there are differences in the positioning of the seat belt during pregnancy.

It is crucial to further investigate the underlying cause of failure in the provision of accurate information on this important subject during antenatal care. It is of concern when Jamjute et al. reported that 16% of health professional indicated a wrong seat belt position.<sup>14</sup> Therefore studies on knowledge and awareness among healthcare professionals and the challenges to impart education on seat belt use in pregnancy during antenatal care should be carried out in future. This will guide further effective intervention to improve women's knowledge on this essential safety issue.

The positive impact on the practice of seat belt use in pregnancy after appropriate information has been imparted has been proven in previous studies.<sup>15,21</sup>

Therefore a combined effort from all parties including media and nongovernmental organizations, in putting effort to diversify the sources of information and public health campaign on seat belt use in pregnancy is vital to ensure more women will be aware and receive the correct information.

Limitation of our study is that we relied on the self-reporting of the wearing of seat belt rather than observed the actual practice which may cause reporting bias, as it was shown that there is a discrepancy between the actual practices when compared to the reported practice.<sup>22</sup>

## CONCLUSION

There is lacking in awareness on the importance and correct seat belt use in pregnancy among the pregnant women. A serious effort should be made on empowering women with adequate knowledge that hopefully will improve their compliance and subsequently will reduce preventable maternal death due to a motor vehicle accident.

## CLINICAL SIGNIFICANCE

Our study showed that there is a need to educate the use of seat belt among pregnant women to reduce the harm caused from noncompliance and incorrect usage.

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