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# EVALUATION OF SEATBELT USE AMONG PREGNANT WOMEN IN SWEDEN

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## ABSTRACT

A digital questionnaire was distributed through social media targeting women who were or had been pregnant. The primary objective was to investigate self-reported seatbelt use and misuse during pregnancy. The second objective was to study if, and to which extent, women had received information regarding seatbelt use and how to wear it during pregnancy.

The survey of 2,030 women who were or had been pregnant showed a total seatbelt wearing rate of 99%. However, 39% were wearing the seatbelt wrongly. In 35% of cases, the shoulder section of the seatbelt was incorrectly positioned, and the lap section of the seatbelt in 8% of cases. In 4% of cases, both the shoulder and lap belt parts of the seatbelt were incorrectly positioned.

The majority (66%) had not received any information regarding proper seatbelt use during pregnancy. Of the 700 women (34%) who had received information, most of them had actively sought out information about how the seatbelt should be worn during pregnancy. This subgroup had significantly lower misuse rate, although a third of the group wore the seatbelt incorrectly. Very few (6%), had received information via a health care provider.

Present data highlight the need for improved seatbelt fit for pregnant women. The result from the survey shows that misuse was lower among the women whom actively searched for information regarding how to wear the seatbelt. To reach other user groups, it should be a priority for several stakeholders to communicate information regarding proper seatbelt use during pregnancy.

**Keywords** Seatbelt, Pregnancy, Misuse.

## INTRODUCTION

A number of studies worldwide have reported that there is a lack of knowledge among women on how to use and position the seatbelt during pregnancy; US [1,2], Japan [3,4], UK [5,6], France [7], and Iran [8]. In the Japan survey by Hanahara et al. [3], involving 680 belted pregnant drivers, 13% used the seatbelt incorrectly. The most common misuse was placing the lap belt across the abdomen (7%) or the thighs (3%). According to the UK survey by Acar et al. [5], which included 1,931 pregnant women from around the world, only a very small proportion (4%) indicated completely correct placement of the seatbelt (i.e. both the hip and diagonal parts of the belt correctly positioned). The most common misuse involved placing the seatbelt '*across abdomen*' (lap part: 45%; diagonal part: 18%) or '*not using the seatbelt at all*' (lap part: 12%; diagonal part: 9%). In the French survey by Auriault et al. [7], involving 135 pregnant women, 20% indicated that they placed the hip belt above/on the abdomen, 13% that they kept the diagonal belt behind their shoulder and about 10% that they did not use the belt all the time. In addition, 35–40% considered/thought that the belt was a potential danger to the foetus.

The need for information regarding correct seatbelt use for pregnant women has been strongly highlighted in several studies [1,2,3,4,5,6,7,8]. For example, Acar et al. [5] recommend that media, the medical community, and automotive industry should provide targeted information regarding correct seatbelt use during pregnancy.

Women's safety while driving and travelling in cars must be studied to a higher extent. The aim of this study was to investigate self-reported seatbelt use and misuse among pregnant women in Sweden. An additional aim was to study, if and to which extent, women had received any information regarding seatbelt use and how to wear the seatbelt during pregnancy.

## METHOD

A digital questionnaire was distributed through social media to evaluate seatbelt use and misuse of during pregnancy. To spread the survey and increase the number of women responding, it was distributed among Folksam Insurance Groups (Folksam) costumers holding a family policy who had a registered e-mail address. In total 31,598 costumers received an e-mail from Folksam, of which 8,209 (26.0%) opened the e-mail and 1,025 (3.2%) clicked on the link to the survey. Furthermore, the survey was distributed by Folksam using sponsored posts (€3,500) on Facebook and Instagram.

The target audience were women in Sweden within the age range 23-44 and mothers of children aged newborn to five years of age. The number of reached people amounted to 182,800 and 1,549 had clicked on the link. The survey was also distributed by the blog "Baking Babies", Facebook group "Mammor United", "Mammagrupp med högt i tak", "Professional Womens Group in Gothenburg", Folksam's and the authors' LinkedIn networks.

The web-based survey began with the question '*Are you or have you ever been pregnant?*', and the survey was terminated for anyone responding with a 'no'. Other respondents continued to complete the entire survey, which included 22 questions on the following topics:

- 1) Personal data: Number of pregnancies, length, Country of birth, driver's license, etc.
- 2) Car use: Access to car, type of use/travel, car brand, position in the car, etc.
- 3) Seatbelt use: Questions regarding seatbelt positions were categorised in two categories describing the hip and diagonal parts of the seatbelt separately. Position, safety concerns, discomfort, etc.
- 4) Information: Received information about correct seatbelt use during pregnancy, source, whether the information was sufficient, etc.

Further information regarding the correct use of seatbelts was not provided in connection with the questionnaire. Estimated time to answer the questionnaire was 10-15 minutes, based on a test by a group of colleagues. Furthermore, an expert group with significant experience of both real-life crashes and car safety was assembled and given the opportunity to comment and adjust the questionnaire. The design of the images/figures describing correct or incorrect use was considered crucial. Therefore, a professional art designer was consulted to create graphical representations of likely seatbelt positions to minimise any misunderstandings. In total, six likely positions of the shoulder section of the seatbelt, and four different positions of the lap belt, were illustrated and supported by verbal descriptions.

The final version of the questionnaire was available online in Swedish, English and Arabic. The Swedish version was used to prepare the English and Arabic version. The translations were made by native speakers of each language. The responses from all versions were combined.

## RESULTS

In total, 2,069 responded to the survey, out of which 2,034 (98%) were, or had been, pregnant. The 35 (2%), who stated that they had not been pregnant were excluded, leaving a study population of 2,034 individuals. The vast majority responded to the Swedish version of the digital questionnaire; 2,006 (98.6%) in Swedish, 24 (1.2%) English and 4 (0.2%) Arabic.

### Personal data

The majority of the women were or had been pregnant during the past five years (96%). In total 594 (29%) were pregnant at the time of the survey. Most were raised in the Nordic countries (97%). The majority (92%), held a

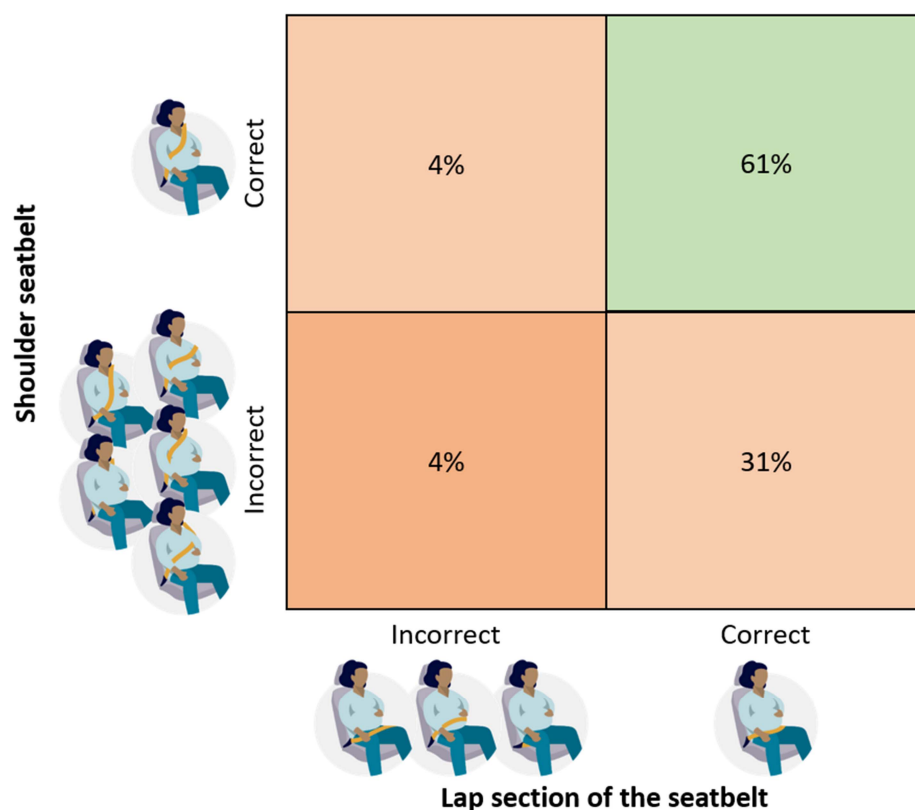
driving license, most of whom had passed the test in the 2000s (89%), in a Nordic country (98%). The majority had taken their driving license in Sweden (96%).

### Car use

Among those who responded, 84% used the car every day or at least a couple of times every week. The vast majority (96%) had access to a car, either a private/company car (90%) or through carpool/renting/borrowing (6%). Family logistics (74%), was the most common reason for travelling by car, followed by sorting things out for the home (64%), vacation/travel (49%) and needing it for work (37%). The environments travelled in were relatively evenly distributed over urban areas (86%), rural areas (78%) and larger cities/centres (70%). The most common car make was Volvo (24%), followed by Volkswagen (16%), Skoda (8%) and Toyota (7%).

### Seatbelt use

In total, 99% stated that they always wear the seatbelt. Based on self-reported seatbelt use 39% were wearing the seatbelt incorrectly (**Figure 1**). The shoulder seatbelt was incorrectly positioned in 35% of cases, and the lap section of the seatbelt in 8% of cases. In 4% of cases, both the shoulder and lap belt parts of the seatbelt were incorrectly positioned. When asked why they were wearing the seatbelt, 96% of the women indicated that they were wearing a seatbelt to protect themselves. Only 68% answered that the seatbelt would help protect the foetus in the event of a crash.

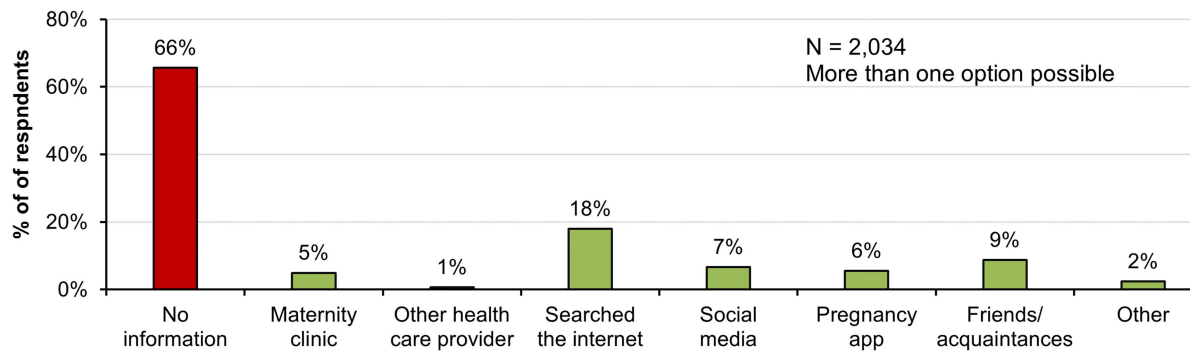


**Figure 1.** Responds to the questions ‘How do you use 1) the diagonal part, and 2) the lap section of the seatbelt?’. (N = 2,034).

### Information

The majority (66%), had not received any information regarding proper seatbelt use during pregnancy (**Figure 2**). Only 6% had received information via the Maternity Clinic (MC) (5%) or via some other health care provider (1%). A total of 700 women (34%) stated that they had received, or actively sought, information about how the

seatbelt should be worn. Yet, a third of this group wore the seatbelt incorrectly. However, the misuse was significantly higher (42%), in the group that had not received any information at all.



**Figure 2.** Responses to the question ‘From whom did you receive the information of how to wear the seatbelt during pregnancy?’ (N = 2,034; more than one option possible).

Of the 700 women who had received information, more than half had actively searched the internet, and a quarter had received the information through friends and acquaintances (**Figure 2**).

When asking ‘from whom they would expect/like to receive information regarding how to wear seatbelts during pregnancy’, 93% responded ‘maternity clinic’, followed by ‘parenting classes’ (39%), ‘insurance company’ (39%), and ‘government agency’ (28%).

## DISCUSSION

Women will experience a wide variety of physical changes during the pregnancy that may affect seatbelt use. In this study, investigating self-reported seatbelt use during pregnancy among 2,034 women, we identified that 99% were wearing the seatbelt. However, only 61% indicated correct positioning of the seatbelt, which is in line with previous findings (68% [2]; 87% [3]; 48% [6]). Incorrect seatbelt use may expose the women and the foetus to an elevated risk, since the forces during an impact will not be optimally distributed over the body. Compared to Acar et al. [5] the misuse proportion of the lap belt was significantly lower. Furthermore, the seatbelt use was somewhat higher in the present study (99%) compared to [1] (95%), [3] (98%), [5] (92%), and [7] (“more than 90%”).

The misuse was significantly lower among individuals that had received some information about how to use the seatbelt while pregnant. Similar findings have been reported by [2,3,6]. Education interventions have been shown to increase the correct usage [9]. For example, a short 1–2 minute instruction film can provide significant improvements in belt use [2]. Other factors that have been shown to affect the seatbelt use include whether the belt is perceived to be (un)comfortable, level of education or social group affiliation, if the pregnant woman believes that the seatbelt protects the foetus, age, legislation, the seat position in the car, and the length of the journey [1,2,4,6].

However, information provided by healthcare providers to pregnant women regarding belt use, seems to be very limited [1,2,4]. Studies have also pointed to ignorance within the healthcare system regarding belt use for pregnant women [10]. Only 6% in the present study had received relevant information from their maternity clinic, although 93% stated that they would have liked to be informed by their maternity clinic. This issue highlights that the women’s expectation has not been fulfilled. Car crashes are one of the main causes of accidental death, disability, and placental abruption in pregnancy [11]. Therefore, it is recommended that healthcare providers take greater responsibility with regard to seatbelt use guidelines for pregnant women.

The final version of the questionnaire was available online in Swedish, English and Arabic. The majority responded in Swedish (94%), only four women responded in Arabic. Although, the survey was available for anyone on the internet, the response rates indicate it therefore can be assumed that the results reflect the Swedish population. Hence, the results might not be applicable for other countries with other cultural backgrounds.

Furthermore, the results may also reflect a population that are more safety-conscious since the respondents actively/voluntarily agreed on participate.

## CONCLUSION

The overall seatbelt use during pregnancy was as high as 99%. However, misuse during pregnancy was common. Present data highlight the need for improved seatbelt fit for pregnant women. The results of the questionnaire shows that the misuse was lower among the women whom actively searched for information regarding how to wear the seatbelt. To reach other user groups it should be a priority for several stakeholders to communicate information regarding proper seatbelt use during pregnancy.

## ACKNOWLEDGEMENTS

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