

On Informing Women of Child Bearing Age about Seat Belt Risk during Pregnancy

Kenya Freeman

Michael S. Wogalter

*Department of Psychology
North Carolina State University
Raleigh, NC 27695-7801 USA*

ABSTRACT

Seat belts have been effective in reducing serious injuries and deaths in vehicular accidents. However, their use by women in the third trimester of pregnancy can cause placental damage and fetal injury or death in relatively minor motor vehicle accidents without severely injuring pregnant women. The lack of seat belt use in similar or more serious accidents could cause severe injuries or death to pregnant women from impacts within the cabin or from ejection, and in turn could lead to fetal injuries or deaths. The present study sought to determine whether women between the ages of 16 and 45 (child bearing age) would like to be informed of these risks. Ninety-nine of the 101 women surveyed indicated they would like to be informed of the risks, and that they would expect to find this information in the vehicle's owners manual. In dealing with the risks, some women indicated that they would wear the seatbelts and others indicated they would not. Most respondents indicated that they would reduce the risks by reducing their use of the vehicle during pregnancy. These results have implications for risk communications.

INTRODUCTION

Automobile restraint systems are intended to hold drivers and their passengers in place during travel. Seat belts have been effective in reducing deaths and serious injuries to occupants of motor vehicles. The National Highway Transportation Safety Administration (NHTSA) estimates that seat belts save 9,500 lives each year in the United States. However, the lap belt portion of the restraint system has been implicated in causing specific trauma to the placenta and fetus in pregnant women, particularly during the third trimester of pregnancy, in relatively minor vehicular accidents (Crosby & Costiloe, 1971).

Several studies indicate that the injuries sustained by the mother and their unborn fetus can include placental abruption, uterine rupture or laceration, and fetal injury (e.g., Klinich, Schneider, Moore, & Pearlman, 1998). There are other potential adverse fetal outcomes as children can develop severe disability as a result of injuries sustained *in utero* (Klinich, Schneider, Rupp, Eby, & Pearlman, 1999).

The American College of Obstetricians and Gynecologists (1991) recommends that pregnant women always wear seat belts to protect both the expectant mother and her unborn fetus. The lap belt portion is to be worn low on the hips, under the unborn child, so that during belt tightening, the loading is on the bony structures of the leg. However, it may not be possible for pregnant women to perform these recommendations

because of their altered anthropometry and/or because of the restraint system's geometry.

Thus, even when the belted restraint system is worn, it may not properly accommodate women in the late stages of pregnancy. In a frontal vehicular impact with ill-fitting lap belts (Griffiths, Hillman, & Usherwood, 1991), the pregnant woman's distended abdomen and uterus flex over the lap belt. This event results in increased intrauterine pressure, which alters the size and the shape of the uterus. The interaction of the abdomen with the tightened lap belt can cause direct injury to the fetus without severely injuring the pregnant woman.

However, not using a restraint system can produce a different kind of scenario and risk. Previous research indicates that maternal death is a leading cause of fetal death accidents. Not using restraint systems increase a mother's risk of dying and sustaining serious injury. In a collision, or even from the maneuvers in a near-miss accident, an unrestrained individual continues to travel until their body collides with the vehicle's interior parts, one or more times, and/or is ejected from the vehicle (Arneson, Beltz, Hahnemann, Smith, Triplett, & Witt, 1986). Thus, the risk to a pregnant woman who does not wear restraints during road travel is injury to herself, her fetus, or both (Attico, Smith, FitzPatrick, & Keneally, 1984; Krozy & McColgan, 1984). In other words, the use of seat belts protects the expectant mother, and therefore increases the fetus's chances of survival.

Even if the restraint system is able to accommodate third-trimester pregnant women and the pregnant woman

uses the restraint, there is still a risk of harm if the belt system is not worn exactly as proscribed. Research indicates that substantial numbers of buckled vehicle occupants (pregnant or not), do not position the belts over themselves properly (Arneson, Beltz, Hahnemann, Smith, Triplett, & Witt, 1986).

There is some ambiguity with regard to how to deal with the restraint system-pregnancy risk. If the restraint system is able to accommodate the pregnant woman then effective warnings to emphasize proper positioning are necessary. However, some restraint designs may not accommodate women in the late stages of pregnancy. In this case, there is some risk regardless of whether or not the restraint system is used. While it might be better to wear an inadequately designed restraint system (as it may be effective in protecting the pregnant woman and because it is against the law not to do so), pregnant women may, nevertheless be hesitant to wear the lap belt because they believe it could hurt their unborn child (see Klinich, Schneider, Moore & Pearlman, 1998). In cases where the restraint system does not fit a woman in the late stages of pregnancy, one potential risk reduction strategy is to reduce unnecessary travel.

The dilemma is whether to inform this population of the above-mentioned risks and to consider how informing them of the risk may affect their use of the seat belt system and the vehicle. Risk communications could be conveyed in various ways. One method is for vehicle manufacturers to communicate the risks to consumers in product owner's manuals. Vehicle manufacturers are most knowledgeable about the characteristics of the vehicles that they produce. Currently, vehicle owner's manuals vary in the extent to which they provide information about the injury risk to the fetus and pregnant woman with respect to the restraint system. Many manuals fail to mention anything, or only make the briefest mention about the special risk to the pregnant woman and the fetus.

This research examines the following issues: Do women of child bearing age want to be informed of the risks? Specifically, the present study investigates whether or not women between the ages of 16 and 45 (child bearing age) would want to be informed of the restraint system risks and whether they would want this information to appear in the owner's manual of the vehicle. Another aim of this study was to determine what behaviors women state that they would engage in based upon being provided information about the restraint system/pregnancy risks.

METHOD

Participants

A total of 101 females of child bearing age (18 to 45) responded to the survey questions described below ($M_{age} = 24.14$ years, $SD = 7.26$.) Seventy were full-time students. Eighty-five were White; the remaining 16 were African Americans, Asians, etc.

Materials and Procedure

A survey of various aspects of technology and safety was distributed to individuals living in the North Carolina area and in other locales. Females between the ages of 16 and 45 (child bearing age) were the only survey respondents asked to complete the questions concerning pregnant occupants of motor vehicles. The following scenario was presented:

“Assume that you are pregnant. Also assume that a vehicle manufacturer has knowledge that in a moderate-to-severe collision that the front passenger-side seat belts, even when worn properly (with the lap belt low across the hip as described in the owner's manual) could seriously/permanently injure or kill a mid- to late-term fetus.”

After reading the statement, participants were asked to answer three questions. The first two questions asked: “Would you want to be informed about this risk?” and “Do you think this information should be in the owner's manual?” For these two questions, they could check “yes” or “no.” The third question stated the following:

“Suppose again that you are pregnant and that you are provided information about the risk to an unborn child from the seatbelts in a moderate-to-severe collision as described above in the scenario, would you do any of the following?”

Participants were asked to check the alternative that best describes what they would most likely do given the following choices:

- “(a) I would not make any changes in using the vehicle and not wear the seatbelt.
- “(b) I would not make any changes in using the vehicle and wear the seatbelt.

(c) I would try to reduce travel in the vehicle and not wear the seatbelt.

(d) I would try to reduce travel in the vehicle and wear the seatbelt.

(e) I would not ride in the vehicle at all.

(f) Other: (please specify)"

For the last alternative, space was provided for participants to write a response.

RESULTS

Of the 101 survey respondents, 99 (98%) said that they would want to be informed about the risk. Ninety-nine (98%) also indicated this information should appear in the owner's manual.

The respondents also indicated how they would behave if given the risk information. Of the 101 respondents, the responses were as follows: Slightly more than half of the respondents (57) responded that they would try to reduce travel in the vehicle and wear the seatbelt. Fourteen indicated that they would not ride in the vehicle at all. Eleven indicated that they would not make any changes in using the vehicle and wear the seatbelt, while four said they would not change their vehicle use and would not wear the seatbelt. Another four indicated that they would try to reduce travel in the vehicle and not wear the seatbelt. Twelve respondents selected the "Other" category; these individuals wrote in their anticipated vehicle-use behaviors. Eight of these women wrote that they would sit in the back of the vehicle. Two women said they would sit in the back, wearing a seatbelt. Two other women noted that they would reduce their travel in the vehicle.

DISCUSSION

Virtually all of the women questioned wanted to be provided information associated with pregnancy-restraint system risks and believed that this information ought to appear in vehicle manufacturer-supplied owner's manuals.

Reducing travel in the vehicle and wearing the seat belt were reported as the most frequent behaviors that they, as a pregnant woman, would perform after being informed of the risk associated with pregnant occupants using seat belts. Others suggested they would sit in the back, while others said that they would sit in the back and not wear the seat belts. Some seemed so alarmed about the risk that they indicated that they would not ride in the vehicle at all. Whether these behaviors are appropriate or whether they can or would be carried out

is not clear at this point. A host of factors may play influential roles in risk-related information processing and decision-making. These factors could include the pregnant woman's need for emergency or job-related travel, and whether the seat belt appears to fit properly, etc. Nevertheless, most women selected the strategy of reducing travel, which is a viable (i.e., doable) method of reducing risk.

Clearly the women in this study wanted information on the restraint system/pregnancy risk. They also indicated that they would act upon that information by reducing nonessential trips. Virtually all of the women expected relevant risk information to be in the owner's manual. Unfortunately, an informal review (by the authors) of various vehicle owner's manuals revealed that many manuals make little or no mention of any aspect of the restraint system/pregnancy risk. It would seem prudent for manufacturers to provide effective risk communications to specific/relevant at-risk target consumers, such as women of child bearing age. Thus, if the restraint system can by its design, accommodate late-term pregnant women, then the owner's manual should provide a clear set of instructions and warnings on how and why the restraint system is to be used. If the restraint system does not accommodate women in the late stages of pregnancy, then information on the risks together with clear warnings and instructions should be given, including the recommendation to reduce nonessential travel.

Having this information available may also prompt parties to search for and/or develop restraint systems that are safer for pregnant women. Perhaps, vehicles could be outfitted with an additional or different restraint system that is designed to fit women in their third trimester (cf. Van Kirk & King, 1969). During the limited period of pregnancy, special temporary restraint systems could be added to existing systems.

This study clearly indicates women want to know about pregnancy/restraint system issues. It is not unreasonable that pregnant women would accept and use special restraints during the last trimester. Many pregnant women would change their normal behavior to protect their unborn child (e.g., avoiding drinking alcohol). Development of restraint systems for pregnant women and effective communications about their use would not only be beneficial by reducing risk, but also marketable given this group's special needs and desire for protection.

This study not only has implications for dealing with the specific risks described in this report, but also may have applicability to risk communications in general. If so, this research would suggest that people want to know

the risks associated with the products they use. Product manufacturers would better serve this need by providing clearly described risk information on the product or in the accompanying documentation.

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