

# The relationship between weight indices and injuries and mortalities caused by the motor vehicle accidents: a systematic review and meta-analysis

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## KEY WORDS

*Body Mass Index*

*Overweight*

*Obesity*

*Injuries*

*Mortality*

*Motor vehicle*

*Accidents*

Received: 2018-12-12  
Accepted: 2019-12-04

## Abstract:

**Background:** The relationship between weight indices and injuries and mortality in motor vehicle accidents is unknown. Systematic review studies addressing the collection and analysis of the relationship in investigations are very limited. The purpose of this systematic review is to determine the relationship between BMI, obesity and overweight with mortality and injuries and their severity and vulnerable organs after the motor vehicle accident.

**Methods:** The databases (MEDLINE/PUBMED, EMBASE, Web of Science, etc) were searched for relevant abstracts using certain keywords. Of all the articles, similar ones were removed considering different filters. The collected data were entered into the STATA SE v 13.1. The heterogeneity of the data was analyzed using  $i^2$  statistics. In addition, the estimates of the study were done based on the age group (children and adults) and the impact of obesity on different regions of the body.

**Results:** A direct relationship was observed between the overall BMI and the degrees of injuries ( $CI=0.503-1.139$ ), and mortality due to motor vehicle accident ( $CI=1.267-1.471$ ). A positive relationship was found between obesity and AIS+2 ( $CI=0.653-1.426$ ), and AIS+3 ( $CI=1.184-1.741$ ), and ISS ( $CI=1.086-1.589$ ).

Also, a negative relationship between overweight and injuries rates, and a direct relationship between overweight and mortality ( $CI=0.979-1.167$ ), and injuries with index of AIS+2 ( $CI=1.178-0.768$ ) and AIS+3 ( $CI=0.48-2.186$ ) were found.

**Conclusions:** The prediction of injury, mortality and severity of injuries in the motor vehicle accident by the variable of obesity and overweight determines the need to design prevention programs for this vulnerable group at all levels.

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## Introduction

Both motor vehicle accident (MVA) and obesity are among the most important causes of mortality and morbidity in the modern world. MVA is a general problem that affects all countries in the world, especially developing countries. According to the World Health Organization (WHO), about 1.25 million people died

due to MVA in 2013. Although mortality rate caused by MVA is slowly declining worldwide, this trend in many developing countries is rising.<sup>1, 2</sup>

In 2014, of nearly 1.2 billion overweight adults all over the world, 600 million people were obese. The World Health Organization has announced that obesity has doubled in the world over the past three decades, and is still growing in the world.<sup>3, 4</sup> Obesity and overweight are among the major public health