

UNIVERSITI TEKNOLOGI MARA

**GUARDIAN ANGEL: THE
WHEELCHAIR FALL DETECTION
SYSTEM FOR THE ELDERLY AND
DISABLED INDIVIDUALS**

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ABSTRACT

Based on data obtained from LGRS-TUA longitudinal study, In Malaysia, the frequency of falls and recurrent falls among the elderly population was approximately 8.5 and 3.2 per 100 person-years, respectively. As our elderly loved one's age, it becomes more important to watch out for their health and wellbeing. Falling is one of the main causes of medical issues that older adults and those with movement impairments deal with, according to the data above. A fall can have a variety of effects, such as cuts, fractures, and in rare circumstances, even fatalities. The likelihood of death from the accident is increased by the extended wait for help on the floor, even in the absence of any immediate effects. Consequently, what would happen if an old person fell out of their wheelchair and was unable to call for help from others nearby or shout louder? This would not be an uncommon circumstance, as many old persons find themselves in dangerous situations without understanding what is happening to them. However, the cost of operation and installation is expensive, and some people can't afford. A fall detection system that is dependable and reasonably priced was suggested in this project to identify those in need of assistance. By employing the accelerometer and gyroscope sensors. When someone falls, the accelerometer and gyroscope sensors can detect it and send us a message on our phone alerting us to the situation so we can come to their aid. The goal of this project is to create an intelligent and efficient fall detection and alarm system using the Internet of Things, an accelerometer, a gyroscope sensor, and a push button. It also intends to monitor elderly and disabled individuals for fall detection and sudden changes in wheelchair mobility.

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CHAPTER ONE

INTRODUCTION

1.1 RESEARCH BACKGROUND

The number of elderly individuals is rapidly increasing worldwide [17]. Like other nations, Malaysia is anticipated to see an ageing population by 2030, with 15% of the populace being elderly [18]. Age-related issues, such as falls among the elderly, will also become more prevalent. The incidence of falls and recurrent falls among Malaysian seniors was around 8.5 and 3.2 per 100 person-years, respectively [19]. It is more common in older adults with poor nutritional status who reside in institutions.

The fall risk phenomena in older adults are not just a statistical measure, it is a complex issue that involves many aspects of mental and physical well-being as well as maintaining one's independence. This formal speech explores the complexities of fall risk, highlighting its wide-ranging effects and arguing for all-encompassing approaches to protect the most valued people of our community.

The implementation of a falling detecting system in Malaysia is an essential first step in addressing population safety and well-being, especially for the elderly and those with mobility impairments. Like many other nations, Malaysia is going through demographic changes as its population ages. There are additional difficulties because of this demographic shift, such as an increased risk of falls and associated injuries. In this case, the falling detection device becomes vital since it offers an early intervention to reduce fall risks, particularly for the elderly. Falling can have serious repercussions, such as injuries, a lower quality of life, and higher medical expenses. Malaysia may strengthen its healthcare system and provide a better safety net for its people by putting in place a falling detecting device. The falling detection device is useful in a variety of work environments, not just for senior citizens. These tools can be used by manual labour, construction, and hazardous environment industries to improve worker safety. In these kinds of situations, prompt identification of falls can result in prompt medical intervention, lessening the severity of injuries. Discussed below are a few of the designs of wheelchair fall detection systems.