## Idea to Modify Dog Wheelchairs to Improve Mobility and Quality of Life for Disabled Dogs

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*Abstract-* Mobility impairment is a common problem among dogs and wheelchairs have become a popular option to help dogs regain their mobility and independence. However, existing dog wheelchairs have limitations and can be uncomfortable for dogs to use. This research paper proposes the need to modify dog wheelchairs to improve mobility and quality of life for disabled dogs. The paper discusses the limitations of current dog wheelchairs and proposes modifications to address these limitations, such as improving the adjustability of the wheelchair and adding padding to increase comfort. The paper also discusses the importance of considering the individual needs of each dog when modifying their wheelchair, such as their size, weight, and specific mobility impairments. Further we can also add GPS tracking system in dog wheelchair. Ultimately, this paper argues that modifying dog wheelchairs can improve the quality of life for dogs with mobility impairments and should be a priority for NGOs, veterinarians and pet owners. We conducted a survey of dog owners and NGOs to assess the potential impact of our proposed modifications on the mobility and quality of life for disabled dogs.

Index Terms- Dog wheelchairs; Canine mobility; Mobility impairment; Animal care; Animal prosthetics

## I. INTRODUCTION

Dogs are known to be man's best friend and the bond between them, and their owners is often unbreakable. Unfortunately, some dogs may suffer from mobility impairments, either due to congenital conditions or because of injury or illness. Mobility impairments can greatly affect a dog's quality of life, leading to frustration, decreased activity levels and a loss of independence. One potential solution for these dogs is the use of dog wheelchairs, which can provide them with the support they need to move around and enjoy their surroundings.

While dog wheelchairs have been used for many years, they are not without their limitations. Many current models are bulky, heavy, and difficult to handle, which can make them uncomfortable or even painful for the dog to use. Additionally, they may not be suitable for all types of terrain, which can limit the dog's ability to explore and interact with their environment. As such, there is a need for modifications and improvements to existing dog wheelchairs to improve their mobility and quality of life for canine patients.

The purpose of this research paper is to explore the idea of modifying dog wheelchairs to improve mobility and quality of life for canine patients. Through a comprehensive review of the literature, we will identify the limitations and challenges of existing models and propose potential modifications that could improve their effectiveness and usability.

Ultimately, our goal is to develop a new and improved dog wheelchair design that addresses the unique needs of dogs with mobility impairments, improves their quality of life and enables them to live active, fulfilling lives alongside their human companions. By combining innovative design principles with a deep understanding of canine physiology and behaviour, we hope to create a new standard for dog wheelchair design that will benefit countless dogs and NGOs for years to come.

## II. LITERATURE REVIEW

Several studies have investigated the use of dog wheelchairs in veterinary medicine. Some studies say that the use of a dog wheelchair resulted in significant improvements in the mobility and quality of life for dogs with hind limb weakness or paralysis.

However, these studies have also highlighted some limitations and challenges associated with the use of dog wheelchairs. For example, dog wheelchairs can be heavy which can make it difficult for dogs to handle in certain environments. Additionally, existing dog wheelchairs are often designed to support the hind limbs only, which can be a problem for dogs with front limb impairments.

Current dog wheelchairs are typically designed to fit a range of sizes and breeds of dogs. However, these wheelchairs often lack adjustability and may not be suitable for dogs with unique needs. According to several research papers, customized dog wheelchairs have shown to be more effective in improving mobility than standard models. Customized wheelchairs allow for a more individualized fit, which in turn can lead to better weight distribution and less stress on the dog's joints.

Current dog wheelchairs are typically designed to accommodate various sizes and breeds of dogs. However, they often lack adjustability, making them ill-suited for dogs with unique requirements. According to several research papers, customized dog wheelchairs have exhibited superior effectiveness in enhancing mobility compared to standard models. Customized wheelchairs allow for a more personalized fit, promoting better weight distribution

and reducing stress on the dog's joints. This emphasizes the potential benefits of tailored, adaptable designs in improving the mobility and overall well-being of dogs relying on wheelchairs.

## III. METHOD

To gather data on the benefits of modifying dog wheelchairs, a survey was conducted with current dog wheelchair users. The survey asked questions about their experiences with standard wheelchairs, specific needs, and potential modifications that would improve their pet's mobility and quality of life. The survey was distributed through online forums and social media groups related to dog care and mobility.

Name, Age & Place		
4 responses		
Prajwala, 20 nellore		
Anjali, 21, Talwara		
Juhi Kumari, 22, Sathwa		
Rahul 23 Hoshiarpur		
Suhana Singh 22 Mukerian		
Ritik 18 Talwara		
Sahas, 22, datarpur		
Swarna,19,Punjab		
Rachna 19 Talwara		

# Have you ever used a dog wheelchair or known a dog that used one? <sup>54</sup> responses





## What features do you think are important for a dog wheelchair?

54 responses



What size range should the dog wheelchair accommodate? 54 responses





## How important is portability when it comes to a dog wheelchair?

54 responses



How much weight should a dog wheelchair be able to support? 54 responses



## How important is adjustability when it comes to a dog wheelchair? <sup>54</sup> responses





## What type of terrain should a dog wheelchair be able to handle?

54 responses



Would you prefer a dog wheelchair that is customizable or one that is pre-built? <sup>54</sup> responses





How much would you be willing to pay for a high-quality dog wheelchair? <sup>54</sup> responses



What materials do you think should be used to construct a dog wheelchair? <sup>54</sup> responses



IV. Image Analysis: Existing Dog Wheelchairs







These images depicting dogs utilizing wheelchairs specifically designed to improve their mobility and quality of life. These images were sourced from an NGO dedicated to the welfare and care of disabled dogs. The purpose of including these visuals is to provide a visual reference for the modifications we propose for dog wheelchairs and to highlight the importance of such enhancements in improving the lives of canine patients. The images serve as a valuable addition to the text, reinforcing the significance of our research and the potential impact of our proposed modifications.

#### V. ILLUSTRATIVE SKETCHES



We have incorporated illustrative sketches to visually convey the proposed modifications for dog wheelchairs. These sketches aim to provide a clear representation of the innovative enhancements we envision. The first sketch showcases a flexible wheelchair design, allowing the dog to alternate between a standing and sitting position. This adaptability addresses the unique needs of canine patients, ensuring maximum comfort and mobility.

Furthermore, our sketches depict essential features that will be integrated into the modified dog wheelchair. These features include a length adjustment mechanism to accommodate dogs of various sizes, a GPS tracking system to enhance the safety and monitoring of the dog's movements and the incorporation of reflective materials to improve visibility during low-light conditions.

#### VI. RESEARCH HYPOTHESIS

H1: Modifying dog wheelchairs can improve the mobility and quality of life of canine patients.

H0: Modifying dog wheelchairs has no significant impact on the mobility and quality of life of canine patients.

In this research, we aim to test two contrasting hypotheses. The null hypothesis (H0) suggests that there will be no significant difference in the mobility and quality of life between dogs using modified wheelchairs and those using standard, off-the-shelf wheelchairs. The alternative hypothesis (H1) posits that modifying dog wheelchairs will indeed have a significant and positive impact on the mobility and quality of life of canine patients. The purpose of this research is to evaluate which of these hypotheses is supported by the empirical data gathered during the study.

**Methodology:** To test these hypotheses, we will conduct a comprehensive study using a sample of 50 dogs with mobility issues. This sample size is chosen to ensure statistical significance and to represent a diverse group of dogs in terms of age, breed, and mobility impairments. The study will be organized as follows:

**1. Participant Selection and Random Assignment**: Dogs with documented mobility issues will be selected to participate in the study. They will be randomly assigned to one of two groups: the experimental group and the control group. The experimental group will receive the modified dog wheelchairs, while the control group will utilize standard, off-the-shelf wheelchairs. This random assignment will help ensure that the two groups are comparable at the outset.

**2. Duration of the Study:** The study will span a period of six months to provide ample time to observe changes in the dog's mobility and quality of life.

## 3. Data Collection:

a. Mobility Assessment: Mobility will be assessed using various objective parameters, including:

- The time taken by each dog to complete a set distance.
- The number of steps taken by each dog during specified activities.
- Range of motion of the limbs, measured using techniques and devices appropriate for assessing canine mobility.

**b.** Quality of Life Assessment: We will employ a standardized questionnaire to assess the quality of life for the dogs in both groups. This questionnaire will include aspects related to physical comfort, psychological wellbeing, social interactions, and overall happiness. Additionally, we will conduct visual observations of the dogs' behaviour in various contexts to provide qualitative insights into their quality of life.

**4. Statistical Analysis:** Data collected from both groups will be subjected to statistical analysis, which may include techniques such as t-tests, ANOVA, or regression analysis, depending on the nature of the data. The analysis will help determine if there is a statistically significant difference between the two groups in terms of mobility and quality of life.

**5. Ethical Considerations:** Throughout the study, we will ensure that ethical guidelines for animal research are strictly followed. This includes providing the dogs with proper care, minimizing any discomfort, and obtaining informed consent from their owners.

**6. Data Interpretation:** After analysing the data, we will draw conclusions regarding the impact of modifying dog wheelchairs on the mobility and quality of life of canine patients. We will evaluate which hypothesis (H1 or H0) is supported by the findings.

## VII. RESEARCH OBJECTIVES

- 1. To identify the limitations of standard dog wheelchairs
- 2. To develop modifications to improve the effectiveness of dog wheelchairs
- 3. To evaluate the mobility and quality of life of canine patients using modified wheelchairs compared to those using standard wheelchairs
- 4. To assess the satisfaction of dog owners with the modified wheelchairs

## VIII. DISCUSSION

Dog wheelchairs are designed to assist dogs with mobility issues such as paralysis, spinal cord injuries, hip dysplasia, or degenerative myelopathy. However, traditional dog wheelchairs have limitations in terms of size,

adjustability, and weight distribution. These limitations can affect the comfort and mobility of the dog and may even cause further injury or discomfort.

Modifying dog wheelchairs can improve their functionality and effectiveness for individual canine patients. Customized dog wheelchairs can be tailored to fit the unique needs of each dog, such as adjusting the height and width of the wheelchair, adding padding or support, or using lighter and more durable materials. By doing so, the wheelchair can provide better support, balance, and comfort to the dog, which can lead to improved mobility and a higher quality of life.

Studies have shown that modified dog wheelchairs can indeed have a positive impact on the mobility and quality of life for canine patients.

## IX. CONCLUSION

Modifying dog wheelchairs to improve mobility and quality of life for canine patients is a viable option that should be considered by veterinary professionals and pet owners. The current limitations of traditional dog wheelchairs can be addressed through customized designs and materials, providing a more comfortable and effective solution for dogs with mobility issues. While there are potential drawbacks to consider, the benefits of modifying dog wheelchairs for canine patients are significant. This research serves as a significant step toward improving the lives of disabled dogs and emphasizes the need for further studies and implementation by veterinary professionals, NGOs and pet owners. Ultimately, by modifying dog wheelchairs, we can provide these loyal companions with a chance to lead active, fulfilling lives alongside their human counterparts.

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