

ACADEMICA PRESS SOLUTIONS

APS

PROCEEDINGS

Editors:

Mohamad Rahimi Mohamad Rosman

Izzatil Husna Arshad

Nurulannisa Abdullah

Amira Idayu Mohd Shukry

Noor Rahmawati Alias

Nik Nur Izzati Nik Rosli

Faizal Haini Fadzil

Mohamad Sayuti Md.Saleh

Mohd Zafian Mohd Zawawi

Meida Rachmawati

VOLUME 15 2024

APS Proceedings Volume 15

Copyright: © 2024 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Published 23 July 2024

e ISBN 978-629-99506-5-3

Editorial team:

Ts. Inv. Dr. Mohamad Rahimi Mohamad Rosman
Izzatil Husna Arshad
Nurulannisa Abdullah
Amira Idayu Mohd Shukry
Noor Rahmawati Alias
Nik Nur Izzati Nik Rosli
Faizal Haini Fadzil
Mohamad Sayuti Md.Saleh
Ts. Inv. Mohd Zafian Mohd Zawawi
Dr. Meida Rachmawati

Published by:

Academica Press Solution ^{003428568-X}
Batu 23, Kg Jias,
17000 Pasir Mas,
Kelantan, MALAYSIA
Email: contact.digit360@gmail.com

Research Article

Revolutionizing Waste into Stick Mobility Bars: A Sustainable Approach to Enhancing Long-Term Health

Norsuriani Samsudin^{1*}, Nurul Hafizah Mohd Yasin², Siti Selihah Che Hasan³, and Norizan Musa⁴

¹ Faculty of Hospitality, Tourism & Wellness, University Malaysia Kelantan, Malaysia; norsuriani.s@umk.edu.my; 
ORCID ID: 0000-0002-7603-7745

² Faculty of Hospitality, Tourism & Wellness, University Malaysia Kelantan, Malaysia; hafizah.my@umk.edu.my; 
ORCID ID: 0000-0001-5297-6812

³ Faculty of Hospitality, Tourism & Wellness, University Malaysia Kelantan, Malaysia; selihah.ch@umk.edu.my; 
ORCID ID: 0000-0003-2297-6074

⁴ Faculty of Hospitality, Tourism & Wellness, University Malaysia Kelantan, Malaysia; norizan.m@umk.edu.my; 
ORCID ID: 0000-0002-1208-0832

* Correspondence: norsuriani.s@umk.edu.my; +6016-9450775.

Abstract: Generally, functional mobility is the way in which people can move about in their surroundings to engage in activities of daily living and to get from one place to another. Functional mobility gives a person the chance to participate in physical activities at home, school, and in the community, improving their quality of life in terms of their health. Obesity is linked to decreased stability and postural control, which may make it more difficult to adjust to changes in the ground or in grade when exercising or walking. The exercises use the custom-designed training sticks as tools to improve range of motion, muscle activation as well as to build a strong foundation for better movement among overweight and obese individuals. In order to address this issue and potentially enhance the general health status of obese individuals, an innovative stick bar from PVC pipes is recommended as a novel invention in this study.

Keywords: obesity; postural control; stability; quality of life; stick bar



Copyright: © 2024 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. INTRODUCTION

Regularly, obese individual is advised to increase their physical activity levels in order to lose weight and lower their metabolic and cardiovascular risk profiles (Perone, et al., 2023). Although the promotion of health and wellbeing is the goal of such guidance, increases in physical activity levels and the advantages that go along with it are illusory unless problems with functional mobility are resolved (Bayartai, et al., 2023). By creating treatments to address their co-occurrence, health practitioners will be better able to improve the health-related quality of life by understanding the factors of functional mobility in individuals with obesity. Generally, functional mobility is the way in which people can move about in their surroundings to engage in activities of daily living and to get from one place to another. Functional mobility gives a person the chance to participate in physical activities at home, school, and in the community, improving their quality of life in terms of their health. Obesity is associated with reduced postural control and stability that could hinder the ability to adapt to changes in terrain or grades during walking or standing especially during exercise (Alice et al., 2022). Therefore,

as new innovation novelty of this study, stick bar is encouraged to solve this address issue, subsequently, could improve range of motion, muscle activation as well as to build a strong foundation for better movement among overweight and obesity individual.

2. PROBLEM STATEMENT

Obesity may affect several parts of the body's activities and structures involved in walking, which can hinder adaptability and cause falls and injuries in people of all ages. Obesity may also restrict a person's capacity for motor planning, or the capacity to organize a movement before it is carried out, which can have an impact on adaption and mobility. Poor motor skills result in poor task performance. Thus, obese people may lose their balance more frequently or be unable to recover from inevitable losses of balance due to poor motor planning and an inability to adjust motor plans while moving. Therefore, exercises with stick bar are great choice for overweight and obese people to improve flexibility, as well as can be incredibly effective for better movement among overweight and obesity individual.

3. MATERIALS & METHODS

3.1 *Product Description and features*

- Resilient Material: PVC is durable and resistant to impact, making it suitable for vigorous workouts and long-term use.
- Weather Resistant: PVC is resistant to moisture and environmental elements, allowing for both indoor and outdoor use.
- Non-Toxic: PVC is generally safe and non-toxic, though it is important to ensure that the PVC used is free from harmful additives.
- Multi-Functional: PVC stick bars can be used for a variety of exercises, including flexibility exercises, balance workouts, and coordination drills.
- Lightweight: PVC pipes are lightweight, making the stick bars easy to carry and transport.
- Compact Storage: Stick bars made from PVC can be easily disassembled and stored, requiring minimal space.

3.2 *Materials*

- PVC Pipes: 1 PVC pipes (length: 4 feet; diameter: 1-1.5 inches)
- Sandpaper: For smoothing edges.
- Measuring Tape: For accurate measurements.
- Saw: For cutting the pipes to the desired length.
- Markers: For marking measurements.

3.3 *Process and steps*

- a) Measure the desired length of the PVC (4 feet) and mark it with a marker.
- b) Use a saw to cut the pipe to the marked length.

- c) Use sandpaper to smooth the cut edges of the PVC pipe to prevent injuries.
- d) Paint the pipe according to favourable colour.
- e) Test the stick bar to ensure it can handle the intended exercises. Start with low-intensity exercises to check stability and strength.
- f) Ensure the stick bar can handle the weight and pressure from the exercises. Reinforce with additional materials if necessary.
- g) Use foam grid at the end caps to both ends of the PVC pipe to add grips where the hands will hold the stick bar. This provides better control and comfort.
- h) Demonstrate the exercise with using this stick bar. Create an exercise routine or circuit training program incorporating the stick bar.

3.4 Value added

Foam Grips: Foam pipe insulation can be cut and secured around the PVC pipe to create a soft, comfortable grip. Materials like foam or fabric can absorb sweat, enhancing grip and comfort. It is also ensuring the grip material has anti-slip properties, especially if the user's hands become sweaty during workouts.

4. NOVELTY/ORIGINALITY

4.1 Environmentally Friendly

Sustainable Material: PVC pipes can be recycled and repurposed, contributing to environmentally friendly fitness practices.

Reduced Waste: Creating fitness equipment from PVC pipes can reduce the need for new materials and minimize waste.

4.2 Customizability and Personalization

Adjustable Design: PVC pipes can be easily cut and adjusted to different lengths and thicknesses, allowing users to customize the equipment to their specific needs and preferences.

Variety of Exercises: The flexibility in design means that the same tool can be adapted for various exercises targeting different muscle groups and fitness goals.

4.3 Portability and Convenience

Lightweight and Portable: PVC pipes are lightweight, making them easy to carry and use anywhere, whether at home, the gym, or outdoors.

Space-Efficient: Unlike bulky gym machines, PVC sticks take up minimal space, making them ideal for home workouts or for use in small fitness studios.

5. IMPACT ON ENVIRONMENT AND SIGNIFICANCE/BENEFIT

5.1 Impact

5.1.1 Recycling and Reuse:

Repurposing Waste: Using PVC pipes, especially those that are otherwise discarded or unused, helps in recycling and reducing plastic waste. This repurposing can help mitigate the environmental footprint of PVC production and disposal.

Resource Efficiency: By reusing PVC pipes, users can help to avoid the need for new raw materials, thereby conserving natural resources and energy that would otherwise be used in manufacturing new fitness equipment.

5.1.2 Durability and Longevity:

Longevity of PVC: PVC pipes are known for their durability and long lifespan, which means that fitness equipment made from them can last for a significant period without needing replacement. This reduces the frequency of disposal and production cycles, contributing to environmental sustainability.

5.2 Significance and Benefit

5.2.1 Safety:

PVC pipes are generally safe to use, as they are less likely to cause injury compared to heavier metal equipment. This is especially beneficial for beginners or those rehabilitating from injuries.

5.2.2 Eco-Friendly:

Using PVC pipes for fitness equipment can be an eco-friendly option if recycled or repurposed materials are used. This aligns with sustainable practices and can contribute to environmental conservation.

5.2.3 Innovation in Design:

The flexibility of PVC pipes allows for innovative designs and adaptations. Fitness enthusiasts and trainers can experiment with different shapes and configurations to target specific muscle groups or to create new workout challenges.

6. COMMERCIALIZATION AND MARKETABILITY

6.1 Market Accessibility and Reach

Wide Market Appeal: The affordability and simplicity of PVC stick mobility bars make them accessible to a broad market, including home fitness users, gyms, physical therapy centers, and schools.

Inclusive Fitness: Targeting segments such as obese and overweight individuals, seniors, and those with mobility issues can broaden the market reach, positioning the product as an inclusive fitness solution.

6.2 Multifunctional Use

Versatile Fitness Tool: The ability to use the PVC stick for various exercise such as stretching, balance, and coordination adds value as a multifunctional fitness tool.

Add-ons and Accessories: Offering add-ons such as instructional videos, workout plans, or attachments (e.g., resistance bands) can enhance the product's utility and appeal.

6.3 Sustainable and Eco-Friendly Appeal

Sustainable Practices: Marketing the use of PVC pipes with a focus on sustainability (e.g., recycled materials) can attract environmentally conscious consumers.

Green Fitness Movement: Aligning the product with the green fitness movement can create additional marketing opportunities and resonate with consumers interested in sustainable living.

Acknowledgments: We are grateful for the University Malaysia Kelantan for their invaluable support in this programme. Other than that, many thanks to those who contributed to this research study directly or indirectly.

References

- Alice, A., Yadav, M., Verma, R., Kumari, M., & Arora, S. (2022). Effect of obesity on balance: A literature review. *International Journal of Health Sciences*, 6(S4), 3261-3279.
- Perone, F., Pingitore, A., Conte, E., Halasz, G., Ambrosetti, M., Peruzzi, M., & Cavarretta, E. (2023, March). Obesity and cardiovascular risk: Systematic intervention is the key for prevention. *In Healthcare*, 11 (6), p. 902). MDPI.
- Bayartai, M. E., Luomajoki, H., Tringali, G., De Micheli, R., Abbruzzese, L., & Sartorio, A. (2023). Differences in spinal posture and mobility between adults with obesity and normal weight individuals. *Scientific Reports*, 13(1), 13409.