ACCEPTABILITY OF EARPLUG USE AMONG SMALL-SCALE METAL WORKERS IN DAR ES SALAAM TANZANIA

Evaline Damasi Asenga, BSc ES

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ACCEPTABILITY OF EARPLUG USE AMONG SMALL - SCALE METAL WORKERS IN DAR ES SALAAM TANZANIA

By
Evaline Damasi Asenga

A Dissertation Submitted in (partial) Fulfilment of the Requirements for the Degree of Master of Science in Environment and Occupational Health

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CERTIFICATION

The undersigned certifies that she has read and hereby recommends for examination of the dissertation entitled **"Acceptability of earplug use among small scale metal workers in Dares Salaam Tanzania"** in fulfillment of the requirements for the degree of Master of Science in Environmental and Occupational Health of Muhimbili University of Health and Allied Sciences.

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Dr. Emmy Metta

(Main-Supervisor)

_____

Date

_____

Dr. Israel Nyarubeli

(Co-supervisor)

_____

Date

DECLARATION AND COPYRIGHT

I, **Evaline Damas Asenga,** declare that this dissertation is my original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature…… **Date……..**

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DEDICATION

This work is dedicated to my beloved parents who raised me, loved and supported me and also taught me the value of hard work. Also my husband Tito Ewald Mateshi, my children Ivan and Ivanna with ought their encouragement and support it would have been very challenging for me to complete my studies. They are my models of courage, determination and achievements.

ABSTRACT

Background of the study: Noise Induced Hearing Loss (NIHL)is becoming a common cause of hearing loss in developing countries particularly among small scale metal individuals who are subjected to loud sound levels above 85dB(A). Due to a lack of proper control measures, this problem continues to affect those exposed. In Sub-Saharan Africa (SSA), factors such as lack of awareness, inadequate workplace safety measures, and limited access to healthcare might influence the prevalence of noise-induced hearing loss. Earplug use has been strongly recommended as a pivotal strategy to enhance the usefulness of global responses to noise-induced hearing loss (NIHL), with the ultimate goal of minimizing or eradicating NIHL by the year 2050. While some developed countries have already implemented such interventions, Tanzania has yet to undertake this key measure, and whether its use will be acceptable among the users is unclear.

Objective: To explore the acceptability of earplug use among small-scale metal workers in Dar es Salaam Tanzania.

Material and Methods: The study was conducted in Ilala and Temeke Districts in Dar es Salaam. It used a qualitative case study design, with in-depth interviews as a data collection method. Twelve participants were recruited purposively for this study. Thematic analysis was applied to examine the acceptability of earplug use among small-scale metal workers using framework analysis.

Findings: Participants expressed acceptability of Earplugs saying that it reduced the amount of noise, and the easiness of using it. Furthermore, acceptability was also influenced by the good reputation of the trainers, close collaboration between workers and service providers, and participants' understanding that the service provider was meant to protect them from the effects of noise. Intervention coherence, intervention burden/barriers, and self-efficacy were also important in explaining the acceptability of earplug use.

Conclusion: The most critical factor contributing to the acceptability of earplug use was the perceived effectiveness of the device in achieving its intended purpose. While participants expressed the understand of earplug in relation to its easiness to use and comfort they experience

while they are on it, they also called for increase education, durable earplugs solution, and better monitoring to enhance intervention's success.

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ABBREVIATIONS

dB (A)	A- weighted decibels
GBD	Global Barden of Diseases
HL	Hearing Loss
HPD	Hearing Protective device
KII	Key Informant Interview
LMIC	Low- and middle-income country
NIHL	Noise Induced Hearing Loss
OEL	Occupational Exposure Limit
OSH	Occupational Health and Safety
PTS	Permanent Threshold shift
SSA	Sub-Saharan Africa
TTS	Temporary threshold shift
WHO	World Health Organization

DEFINITION OF TERMS

Noise: Can be defined as any unwanted, disruptive, or irrelevant disturbance that interferes with the normal functioning, clarity, or accuracy of a system, process, communicational. This term is used across various fields, such as acoustics, signal processing, electronics, communication theory**,** (and generally refers to unwanted or disruptive sound (1).

Acceptability: refers to the quality or state of being acceptable, meaning that something meets the required standards, criteria, or expectations. It is a subjective judgment based on individual or collective values, preferences, or norms (2).

Earplug: Is a small device designed to be inserted into the ear canal to protect the ears from loud noises. Earplugs are commonly used in various settings to reduce the intensity of sound or to prevent water from entering the ears. They come in different shapes, sizes, and materials, but their primary purpose is to create a barrier that helps attenuate or block sound waves (3).

Burden: Is described as a source of difficulty, trouble, or hardship that a person or group may experience. This could be a burden in the form of challenges, obstacles, or adversity (2).

Experience: Often implies the knowledge, skill, or expertise gained through practical involvement, often over a period of time. For example, work experience in a specific job or field contributes to a person's professional expertise (4).

Metal material: In materials science and engineering, "metal" can refer to a substance that usually refers to something that is commonly tough, reflective, glossy, and possesses excellent electrical and thermal conductivity. Metals are often used in the production of various objects and structures due to their desirable mechanical properties (5)

Concurrent acceptability: Refers to the degree to which participants find an intervention or treatment acceptable while they are actively using it. It assesses immediate reactions, comfort, usability, and satisfaction with the intervention in real-time(2).

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Occupational noise-induced hearing loss (NIHL) poses a significant public health problem, imposing considerable economic constraints (6). According to a WHO report it is estimated that by 2050, about 2.5 billion people will have hearing loss, and over 1 billion young adults risk permanent hearing loss due to unsafe practices; at the same time, an annual investment of less than 1.40 US dollars will be required to scale up global ear and hearing service per person (7). In 2019, around 72.88 million people in the United States experienced hearing loss, which was about 22.2% of the total population. This condition contributed to 2.24 million Years Lived with Disability (YLDs), making up about 3.6% of all YLDs in the US (7). The estimated prevalence of Noise-Induced Hearing Loss (NIHL) ranges from 7% to 21%, with higher rates observed in developing countries, particularly in Sub-Saharan Africa (8). With this situation, therefore, it is beneficial to prevent NIHL among exposed individuals.

Occupational noise exposure has been linked to a range of auditory such as NIHL and non-auditory health effects, including annoyance, sleep disturbance, cardiovascular disease, and impairment of cognitive performance in children (9). The characteristic and pathological features of NIHL remain challenged, however, it is documented to be manifested by the loss of auditory sensory cells in the cochlea (10). Due to the fact that once cochlea hair cells cannot regenerate in mammals, prevention of NIHL is the only viable option to preserve hearing health, particularly in workplaces with high noise exposure (11).

Several studies have documented noise control measures following a hierarchy of hazard controls such as engineering and administrative control which has shown to be somewhat effective (12). These control measures include engineering intervention following the implementation of stricter legislation (12) they have been utilized mostly in the formal sectors in developing countries. However, various workplaces and studies show that the initial approach to lowering noise exposure often focuses on providing and utilizing Hearing Protection Devices

(HPDs) such as earplugs (12). When used properly, they effectively reduce noise exposure among exposed individuals and preserve hearing health (13,14).

Unfortunately, interventions involving the use of earplugs have not been tried in informal sectors in developing countries, including Tanzania, and its effectiveness has not been systematically evaluated. Therefore, implementing such interventions would benefit noise-exposed individuals working in informal sectors.

An earplug is a small device designed to be inserted into the ear canal to reduce or block out external noise and protect the ears from loud sounds. Earplugs are commonly made of foam, silicone, rubber, or other materials and come in various shapes and sizes to provide a comfortable fit in the ear. They are often used in industrial settings to promote noise reduction (15).

There is an intervention project regarding earplug use which has been conducted within two small-scale metal factories in Dar es Salaam. All workers exposed to noise levels above 85dB (A) will receive earplugs to use daily. Furthermore, they will receive training and awareness on how to use the earplug effectively. This project will last for three months and it is going to be conducted during the intervention. Since this is a new intervention that has not been implemented in this type of working population acceptability of earplug use might hamper the success of this intervention. Therefore, studies on understanding the acceptability of earplug use among these small-scale metal factory workers are suitable for this working population.

Acceptability has become a key factor in the developing, assessing, and implementing healthcare interventions (2). The effectiveness of the implementation links the degree of acceptability among both those delivering and receiving the intervention (2). studies have showcased the efficacy and relevance of the acceptability framework across various interventions, including its application in initiatives like the Tanzanian public health facilities' primary vendor system (4). Therefore, this study aimed to understand the acceptability of earplug use among small-scale metal workers in Dar es Salaam Tanzania.

1.2 Problem Statement

Findings from some researchers conducted in developing nations such as Tanzania indicate that employees within various occupational setting such as textiles and metal manufacturers, are subjected to the level of noise exceeding the occupational threshold for exposure, set at 85 dB(A). This has resulted in an increased prevalence of NIHL particularly among working populations and the trend is projected to increase in the future (16,17). In the formal sectors such as mining and iron and steel factories, NIHL is as high as 47% and 48% respectively (8,18). This is well above the global average prevalence of 7-21% (12). The situation is likely to be worse in less regulated small-scale factories where individuals work for earning life without ear protection. It is therefore important that any effective hearing conservation intervention would benefit working populations exposed to high noise levels at work.

Despite the fact that noise reduction interventions have been undertaken at workplaces to conserve hearing health, their effectiveness has varied across global regions (12). The most preferred and used intervention in most formal sectors has been the use of hearing protection devices such as earplugs. However, the use of earplugs in Tanzania is new and their acceptability among users especially in the small-scale metal works is unknown. The current study aims to explore the acceptability of earplug use among small-scale metal workers in Dar es Salaam Tanzania to inform its implementation and scale up to other small-scale industries.

1.3 Conceptual framework

This study uses the theoretical framework of acceptability of healthcare intervention to understand the acceptability of earplug use among small-scale metal workers. The framework consists of seven constructs which was operationalized to suit this study. These constructs include burden (the perceived amount of effort that is required to participate in the intervention); affective attitude (how an individual feels about the intervention), ethical consequences (The extent to which the intervention has a good fit with an individual's value system), opportunity costs (The extent to which benefits, profits or values must be given up to engage in the intervention), Intervention coherence (The extent to which the participant understands the intervention and how it works.), perceived effectiveness (The extent to which the intervention

is perceived as likely to achieve its purpose) and self-efficacy (The participants' confidence that they can perform the behaviour (s) required to participate in the intervention). In this context, the framework were modified to include only three constructs that are relevant for describing acceptability of earplug use among noise exposed workers. Thus, the relevant constructs are self-efficacy (explained as perceived ability of workers to correctly use earplugs); in this construct participant self-monitoring on the earplug use were evaluated, measuring their confident level in the ability to correct insert earplug and their response to not at all confidence or extremely confidence. Barrier/Burden (Explained as the perceived amount of effort that is required to participate in the intervention) and Intervention coherence (Explained the extent to which the participant understands the intervention and how it works).

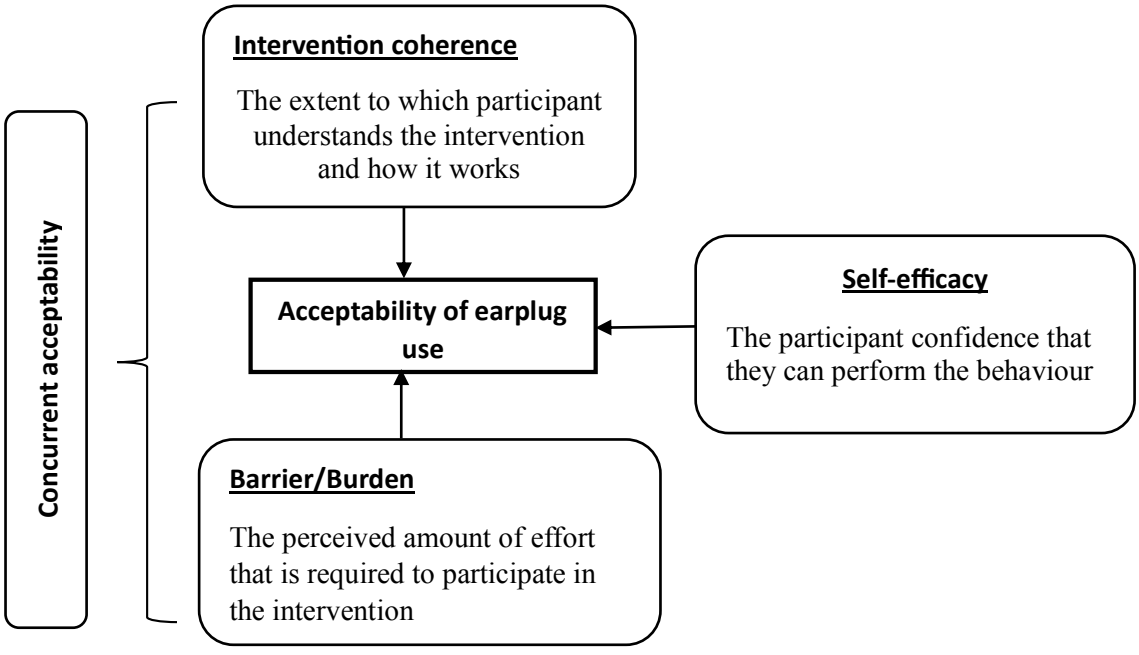


Figure 1: Modified theoretical framework of acceptability of earplug use adapted from Sekhon et al (2017) (2).

1.4 Rationale of the Study

In Tanzania, particularly within formal sectors like mining and iron and steel factories, the prevalence of NIHL is notably high, reaching 47% and 48%, respectively(8,18). This rate significantly exceeds the global average prevalence, which ranges from 7% to 21%(12).This study highlight the need to understand the acceptability of earplug use among SSMW in order to reduce NIHL among this working population. This understand will help in addressing factors that influence earplug use among workers, particularly in informal industries within developing regions. Finding from this study can save as baseline information for further research focusing on interventions that not only introduce hearing protection but also promote its consistent use. Such interventions could significantly reduce the risk of noise-induced hearing loss (NIHL) in vulnerable occupational groups. Furthermore, the findings of this study can serve as a model for future hearing conservation efforts, contributing to broader public health strategies focused on NIHL prevention. Ultimately, this research supports workplace safety policy advocacy and encourages the widespread adoption of hearing protection in Tanzania and other similar contexts.

1.5 Research Question

1.5.1 Main research question

What is the acceptability of earplug use among small-scale metal workers in Dar es Salaam Tanzania?

1.5.2 Specific research questions

1. What is the intervention coherence of earplug use among small-scale metal workers in Dar es Salaam?
2. What is the perceived Self-efficacy of earplug use among small-scale metal worker in Dar es Salaam?
3. What are the perceived barriers of earplug use among small-scale metal workers in Dar es Salaam?

1.6 Research Objectives

1.6.1 Main research objective

To explore the acceptability of earplug use among small-scale metal workers in Dar es Salaam Tanzania.

1.6.2 Specific Research Objective

1. To assess the intervention coherence of earplug use among small-scale metal workers in Dar es Salaam.
2. To evaluate the perceived self-efficacy of earplug use among small-scale metal workers in Dar es Salaam
3. To explore the perceived barriers of earplug use among small-scale metal workers in Dar es Salaam.

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter provides an in-depth review of literature relevant to the study objectives under this thesis. It gives perspectives on the acceptability of earplug specifically for workers in metal factories. Different studies regarding the subject matter are highlighted under this section.

2.1 Perceived Intervention coherence of earplug use among small scale metal workers

The primary motivation for using earplugs among small-scale metal workers is to safeguard their hearing health since earplugs act as a crucial preventive measure, providing a physical barrier against harmful noise levels and reducing the risk of long-term auditory damage (19).

Various studies reported continuous being exposed to elevated noise levels can result in fatigue. and stress among metal workers while earplug use has been associated with reduced fatigue levels, as workers experience less strain due to noise exposure and by providing a quieter and more comfortable working environment, earplugs contribute to a decrease in stress-related issues, promoting the overall mental well-being of workers (11). In addition to individual well-being, the economic implications of hearing protection in small-scale metalworking industries are significant. Preventing hearing loss through earplug use reduces the economic burden associated with occupational hearing disorders, including medical expenses, rehabilitation costs, and potential compensation claims (20).

Most of studies from developed countries revealed a high level of acceptance of earplug use among small scale metal workers associated with the perceived benefits of the device (21–23). A study conducted in Ireland reported most workers do agree that wearing earplugs prevents abnormal hearing, noise annoyance, tinnitus, deafness as workers believe using earplugs can protect their hearing, therefore they recommend their uses for workers working in noise environments (24).

A study in the United States reported perceived benefits from the use of earplugs by small-scale metal workers being like fear of hearing loss as results revealed that participants were aware

that high levels of noise can damage hearing, and that the damage is gradual and not instantaneous (25).

Another study conducted in Portugal, reported that workers perceived benefits of wearing earplugs as it reduces the volume of noise experienced by the user is possible. Research investigating adherence to earplug usage has shown that reducing the duration of wear can greatly impact the seriousness and duration of auditory fatigue, a precursor to permanent hearing impairment. Conversely, consistent and correct use of earplugs can help prevent noise-induced hearing loss (26).

A study conducted in Nigeria revealed small scale metal workers perceived high benefits from using earplugs as improper or nonuser of it can cause various health effect hearing loss due to noise exposure, noise also elicits non-auditory effects that include hypertension, psychological effects (annoyance, stress), impaired communication, reduced productivity and increased safety risks. Therefore, workers recommend supply of HPDs and proper use of it to avoid all burdens from high noise exposures (27).

A study conducted in Ireland in 2015 by Kelly et al reported perceived benefits from using earplugs as it may prevent ringing in ears after work (28). Many other studies conducted in sub Saharan African countries reported small scale workers being perceiving high benefits from the use of earplugs even though they are not using it frequently and sometimes they are not using at all although they work in noise environments among those benefits mentioned include preventing hearing getting worse in the future, other workers reported hearing loss would limit their daily activities also may cause relationships with family and friends suffer, and negatively impacts a person's job performance. The benefits of using hearing protection, devices would outweigh the costs, and it would be stressful to have a hearing loss (15,29,30).

In most developing countries, little has been published concerning the perceived benefits as a factor influencing acceptance of earplugs use among small scale metal workers, and most have been done on utilization of personal protective equipment and associated factors in construction sites and even on noise exposure and self-reported hearing impairment among gas-fired electric plant workers in Tanzania (31,32).

The literature on acceptance of earplug use among small-scale metal workers in Tanzania is limited, emphasizing the need for context-specific research. Tanzania, like many other developing countries, faces unique challenges in terms of occupational health and safety practices.

Factors such as limited resources, inadequate training, and a lack clear regulatory enforcement may contribute to the underutilization of earplugs in small scale metalworking industries (1)

Therefore, this study aimed to explore the acceptance of earplug use among small scale metal workers using Dar es Salaam-Tanzania as a case study area to uncover such as existing information gap for promoting occupational health and safety in these environments.

2.2 Perceived self-efficacy of earplug use among small-scale metal workers

Currently, there is a growing awareness of the perceived self-efficacy associated with earplug use among small-scale metal workers in many settings especially in developing countries due to raised health concerns associated with high occupational noise exposure which is beyond the technical aspects of earplugs (33). In this study, the acceptability of earplug use can be shaped by self-efficacy reported as the participant's confidence that they can perform the required behaviour to participate in the earplug use intervention.

Studies from most developed countries reported high self-efficacy of earplug use among workers exposed to high noise levels which is highly influenced by workers' knowledge and having adequate information on the benefits of earplug use, potential harm of noise exposure and proper techniques for insertion and maintenance of the device, but also positive experiences with earplug use such as effective noise reduction and comfort contributed to increased self-efficacy (22,28,34).

The study conducted in Malaysia reported high self-efficacy from the earplug use which was mainly associated with perceived control whereby workers feel in control of the decision to use earplugs and have autonomy in the choice since the device where much available and well supplied in the working stations but also comfort and fit of earplug increased the confidence of using earplugs lather than earmuffs (35). Other study in Thailand reported that most metal

workers working in small scale industries were confident in their ability to wear earplugs, as demonstrated by the fact that they always or almost wore earplugs at loud working environments, as some participants reported the use of earplugs without fail and being willing to wear earplugs despite the possibility of disapproval from peers (36).

According to study conducted in Guimaraes Portugal, workers shows limited understanding regarding the significance of duration of use in determining the overall effectiveness of earplugs., and generally avoid wearing earplugs due to being not confident in using them influenced by lack of proper knowledge on the earplug use, maintenance and its side effects. Also, the study reported that approximately 25% of workers in their study did not receive any instruction regarding the correct use of earplugs and that contributed to workers' limited self-efficacy to using earplugs. Low self-efficacy can lead to de-motivation and discouragement leading to poor hearing protection behaviour (26).

Peers can be seen to exhibit behaviour that either can act as support for or barriers against earplug use according to the study conducted in the United States revealed that workers were motivated and confident to wear earplugs after seeing co-workers carrying out this behaviour, received adequate training on the proper use of earplugs and receiving adequate supervisor encouragement and support. There was also evidence that collective behaviour of a work group may function as a social modelling stimulus for earplugs use and workers were highly motivated to wear earplugs because they reminded each other to wear earplug at workplace area (37).

According to a study conducted in Canada reported that in many cases, most participants' high self-efficacy was evident in their willingness to wear earplugs despite the possibility of disapproval from peers. When participants were asked what they believed other metal workers thought of their decision to wear earplugs, while many responded with disinterest, with the majority explicitly stating that they don't care what other people think, as some respondents, reported that they don't care if anyone points out that they are wearing earplugs because they sort of care about their hearing more than anything (38).

In developing countries especially sub-Saharan African countries, low confidence level (reported self-efficacy) is reported in many working areas with high noise exposure (23,39). For

example, according to the study conducted by Robertson et al, small scale metal workers thought that noise was not a problem for them and that they were tough enough to negate the effects of noise. The idea that some workers do not feel the need to wear earplugs because they can physically cope with noise. It contains an implicit assumption that invulnerability is a manly trait, and implies that this view is believed to be misguided (40).

This kind of attitude may also be driven by the need to be popular among peers as it is likely that some workers think that by demonstrating negative safety behaviour they will earn the respect of peers for being a tough worker. But also, low perceived self-efficacy of earplug use was due to un comfortability from use, communication barriers with other workers, loss of hearing when working, co-workers often don't wear them, and lack of clear information on when you should wear them, and co-workers find it funny others wear earplugs (30).

Similarly, according to a study conducted in South Africa reported low self-efficacy among small scale metal workers on using earplugs since they perceived the device to have side effects since they cause ear discomfort and need to be thoroughly cleaned before use, and failure to do so may cause ear infections and increase the possibility of hearing loss. Ear infections would result in discomfort with the use of earplugs and employees neglect to use it, which would expose them to the risk of acquiring further hearing loss (41). Similar findings were found in other studies that were conducted in Pahang Malaysia ,according to Kitcher et al reported small metal workers perceived low ability to use earplug as they perceived to cause irritation inside the ear due to increased sweating, which then can lead to discouraging the use of earplugs (42).

Contrary to a study conducted in China by Jing Liu reported small scale metalworkers having good perceived self-efficacy from the earplugs use as not only do they offer sufficient noise reduction, but these devices are also comfortable to wear and effective. with it, painless, tight, not bothersome and very light (not heavy) settings (43). Other studies reported high confidence and need of using earplugs as it has no side effects associated with their use, instead may increase comfortability, and prevent noise-induced hearing loss. Indeed, reported to be likely to encourage other people to wear earplugs, and confirmed to do so or had done so in the past (20,23,44).

A study in Guimarale Portugal reported workers had good perceived self- efficacy on the use of earplugs as they demonstrated that earplugs had no any side effects on users health instead they are more safe and efficient in preventing induced hearing loss when working in noise environment. Factors like softness, smoothness, good fit and simple to use of the device. Indeed, they reported to be likely to encourage other people to wear earplugs during their working hours in noise environments (45).

Other study conducted from Nigeria, small scale metal workers reported occupational noise can precipitate sleep disturbance, feelings such as annoyance, and a higher incidence of occupational accidents and sometimes may contributes to hypertension and other cardiovascular diseases (CVDs) therefore, they recommend all workers to use hearing earplugs due to its suitability to various working settings (43).

According to a study conducted in Egypt ,some other reasons that influencing the high self-efficacy of using earplugs include the fact that are painless and they need to wear hearing protection devices to avoid noise induced hearing loss (46). Contrary to the study conducted in Dublin Ireland which reported workers low perceived self-efficacy with the use of earplugs as they perceived the device may be associated with ear infection or injury from inserting earplugs and additionally (28).

In Tanzania, little is known concerning the reported perceived self-efficacy of earplug use due to paucity of published data on the topic, therefore this study will cover such an information gap which will aid in designing hearing protection intervention among small scale metal workers.

2.3 Perceived burden of using earplug among small scale metal workers

The occupational health and safety of workers, particularly in small scale industries involving metalwork, are of paramount importance since there is little efforts put in place by the responsible authorities in most of developed and developing countries, therefore subjecting workers to temporary and even permanent induced hearing loss (47,48). Exposure to high levels of noise in metalworking environments can lead to serious adverse health effects, including hearing loss, stress, and other related health issues making the use of earplugs a crucial preventive measure to mitigate the problem (36). Perceived burden in this study will be reported

as the reasons for discontinuation or dropout from the use of earplugs as the hearing protective device among small scale metal workers who are more susceptible to high noise level exposure (above 85bdA).

Many researches globally indicated significant burdens and barriers to adoption the use of earplugs among small-scale metal workers.

These burdens for earplugs use dropout include discomfort, lack of awareness, perceived inconvenience, and concerns about communication difficulties in noisy environments with colleagues which limit teamwork and increase risk of injuries have been reported by metal workers in most of small scale industries (49,50).

A study was conducted in Taiwan reported small scale metalworkers perceived burden concerning the use of earplugs as they may experience isolation, difficulty communicating (communication barrier), potentially compromising teamwork and safety or reduced awareness of their surroundings posing potential safety risks, inadequate hearing ability which might affect worker's overall wellbeing and job satisfaction but also workers reported improper use might contribute to discomfort or ear related issues, all this making them discontinue to use (34).

A study done from Ireland in 2021 reported that workers discontinue to use earplugs in their workplaces due to the fact that co-workers doesn't use HPDs like earplugs throughout the working day in loud noise areas, supervisors don't warn or urge workers about not wearing earplugs. Other workers reported sometimes even supervisors didn't use earplugs in loud areas and there is a lack of organization HPDs rules to make them use it all the time (24). Also study conducted in Taiwan revealed several reasons for the non-use of earplugs in the workplace including the absence or deficiency of training, age of the worker, fitting, lack of comfort and job competence (51).

A study done in Malaysia reported that lack of comfort as the first reason workers neglect to wear earplugs and other hearing protective devices but also a shortage of protective devices as earplugs require working in clean environment rather than in very dirty surroundings therefore exchange use is of more important and the lack of knowledge of safety, especially on the

importance of earplugs among workers, are also the reason why earplugs is being neglected (52).

Also, a study conducted in Thailand and Malaysia 2024 reported that discomfort was the main barrier in preventing workers from using earplugs as the hearing protection device but also lack of knowledge and clear safety rules and policy make them not to use earplugs consistently (36,53).

Furthermore, a study conducted in Ethiopia reported various perceived burdens causing discontinuation from the use of earplug scale small-scale industry workers like feeling uncomfortable, also earplugs interfere with the ability to do the job as workers reported they cannot hear each other, unavailable of earplugs and other workers reported when they wear earplugs, co-workers would make fun of them, therefore making them quite from using it. But also, workers reported the importance and the need to develop a new habit of wearing earplugs (54).

Another study conducted in Addis Ababa, Ethiopia revealed that earplug utilization among workers working in high-noise areas is low and the main reasons for dropout are earplugs unavailability, lack of safety training, and the absence of orientation on using earplugs and its side effects, affecting their perceived efficacy of the tool while the associations demonstrated a good company policy, training and earplugs availability influences workers to wear earplugs to protect their ear health (55).

The reasons mentioned by a study which was conducted a study in Nigeria include pressure from peers, limited of knowledge about noise induced hearing loss and earplugs use, discomfort, safety concerns, inconvenience, unavailability, and increased cost. Further reasons reviewed suggest that individuals may not wear HPDs including earplugs while exposed to excessive noise because they are unaware of the risks of loud noise, or do not consider hearing loss to be a major concern (25).

Further studies conducted in sub-Saharan African countries reported that many workers working in areas with high noise levels discontinue using earplugs despite their benefits due to diverse

reasons and factors like teamwork challenges as the reduced hearing ability may hinder collaboration and teamwork in small-scale industries, impacting overall productivity also, diminished awareness of surroundings due to earplug use can pose concerns related to worker safety, increasing the likelihood of accidents. Sometimes workers may experience dissatisfaction due to the discomfort and potential isolation caused by prolonged use of earplugs, affecting their overall job satisfaction (40,56,57).

Currently, little information has been documented in Tanzania, and there is paucity of information concerning the acceptability of using earplugs among small-scale metal workers in Dar es Salaam, therefore this study aimed to cover the existing information gap.

CHAPTER THREE

3.0 METHODOLOGY

3.1. **Study design**

This study was a case study design aiming at gathering in-depth information about the acceptability of earplug use among small-scale metal workers. The rationale of the case study design is to address a research inquiry through an in-depth investigation of a current real-world phenomenon within its specific context. According to Yin et al, (2003), a case study design is one that answers why and how questions while the researcher does not influence the study population's behaviour and activities. Case studies design should be utilized in the following situations: (i) The researcher wishes to concentrate on the how and why; (ii) The behaviour is to be observed without manipulation; (iii) To gain a deeper understanding of a specific phenomenon; and (iv) If it is unclear where the boundaries between the phenomena and the setting are (58).

A case study design was suitable for assessing the concurrent acceptability of earplug use. This approach allowed for an in-depth exploration of small-scale metal workers' understanding, their confidence in using earplugs and also helped to uncover what they perceive as barriers of earplug use. A case study design provide a comprehensive understanding of complex behaviors and attitudes, offering valuable insights into real-life practices and experiences within worker's environment.

3.2 **Study area**

This study was conducted within two small-scale metal factories situated at TAZARA Street and Kariakoo ward in Ilala District in Dar es Salaam region. A recent investigation reported that the noise levels in these two metal factories exceeding 90 dBA [manuscript under development].

These particular factories were selected for the study due to it's conveniently location and employing 200 and 150 workers, respectively. Workers were engaged in various metal fabrication activities such as cutting and shaping of metal pieces according to the designs specification. These factories are well-organized and possess a leadership structure that has

resulted in their registration as cooperative societies. These workplaces represent a typical small-scale workplace in most of developing countries including Sub-Saharan Africa.

3.3 **Study population**

The targeted population for this study was all small-scale metal workers who have a minimum of one year of experience working in a metalworking environment; this was to ensure they have a baseline level of familiarity and skill in the field.

3.4 Sampling technique and sample size selection

A purposive sampling technique was used to select participants for recruitment in the study. A total of six workers from each factory were purposively chosen, categorized based on their years of experience within the factory, as recorded in the roster book. Each subcategory included workers with varying levels of experience, and only those with more than one year of experience were selected, leaving behind those with less than one year of experience.

Despite the selection, the determination of the actual number of study participants were guided by saturation principle.

3.5 **Data collection method**

In-depth interviews (IDIs) were used to collect data from small-scale metal workers. The interview guide was structured around themes related to the workers' perspectives on perceived barriers, self-efficacy, and intervention coherence regarding earplug use. The purpose of using IDIs was to gain insights into individual opinions and attitudes.

In-depth Interviews are advised to be used to the study like this since it has been successfully proven in other intervention studies such as a cancer prevention interventions and healthy eating interventions studies (59,60).Participants were interviewed one by one, each interview lasted approximately 45 to 60 minutes, and the administration office was chosen as the interview location because it provided a conducive environment for participant privacy.

3.6 Trustworthiness

The aim of ensuring trustworthiness in this study was to ensure that the data collected from the field were valid and reliable. Trustworthiness was evaluated based on several dimensions: credibility, dependability, transferability, and confirmability.

Credibility was maintained by carefully designing in-depth interview questions that aligned with the study's objectives and piloting the tool with two participants prior to finalizing. Interviews conducted in Kiswahili ensured clear communication, established rapport, and encouraged participants to share information freely. Regular checks confirmed that participants' views were accurately represented. Consulting with colleagues and supervisors in data processing and analysis further strengthened the credibility of the findings.

Dependability was ensured through thorough data reviews by the researcher to check for consistency, aiming to establish the study as dependable. Transferability was supported by proper describing the research process, including study participants details and conducting deep reading and thorough analysis of the transcribed in- depth interviews, which facilitated applying the findings in different situations.

Confirmability was maintained by clearly describing small scale metal worker's views, and using direct quotes from participants to accurately portray their perspectives. Additionally, the researchers' opinions and understanding of earplugs use were described before any data was collected(61).

3.7 Data management and analysis

Data management

Data management was conducted with a high level of confidentiality. All audio recordings and transcripts were securely stored on a password-protected computer, with access restricted to authorized research personnel. Only individuals directly involved in the study had access to the data.

Data analysis

Data processing occurred following the collection of data from the field. The data were analyzed using a thematic approach, which involved a series of steps including deep reading and data review, organization, coding, and interpretation. The analysis adhered to the six-phase thematic analysis approach proposed by Braun and Clarke(62).

To ensure transparency and a clear audit trail, all coding decisions, theme development, and changes during analysis were systematically documented. The process is outlined as follows:

Familiarization with the Data: During data processing, all participant information from interviews was recorded and transcribed verbatim. Accurate translation from Kiswahili to English ensured consistency in the analysis. Familiarization involved repeatedly listening to audio recordings, reading field notes, and reviewing transcripts, providing an in-depth understanding of the content and ensuring data clarity, which laid the groundwork for thorough thematic analysis. Memos were kept during this stage to record initial thoughts and reflections.

Generating Initial Codes: Initial coding involved identifying and labeling relevant data, and breaking it into manageable segments or categories. The researcher used highlighters and comments to mark specific sections in the data. These annotations described the content of individual lines or paragraphs. As the coding process continued, the codebook evolved gradually, improving the systematic organization of the data. Each coding decision was logged in a coding journal, and justifications for code merges or changes were recorded.

Searching for Themes: Examining how different codes relate to each other was important for grouping them into categories and finding themes. Thinking deeply about the initial codes helped improve the list of codes, revealing more details and patterns in the data. The process of going back and forth helped the researcher better understand the main ideas. Careful attention was given to identifying themes in the data, ensuring that all significant information from the interviews was captured. Theme development was discussed with a second researcher, and any modifications were documented to provide a clear audit trail.

Reviewing Themes: To ensure accuracy and clarity, the identified themes were carefully reviewed. This included checking for consistency across themes to ensure they accurately reflected the data. Thoroughly examining all themes and assigning appropriate codes were essential steps. The final codebook, which included clear definitions, guided further data analysis. A detailed log of changes in theme definitions and structure was maintained throughout this stage.

Defining and Naming Themes: The themes were clearly defined and given specific names. The analysis examined how categories were similar, different, or varied in shaping these themes. These themes represent important patterns in the data and were named to organize the main ideas derived from the interviews. This approach ensured clarity and descriptive depth in the report, thereby enhancing the study's findings' accessibility. Decisions on theme naming and categorization were documented in a memo to ensure clarity and transparency in the final stages of analysis.

Report writing: Excel program was used to efficiently organize the data. All questions and responses were carefully entered and organized in Excel. Both the researcher and an assistant coded and labeled transcripts to ensure accuracy and consistency. This thorough process resulted in three main themes and eight sub-themes, which were presented in the findings chapter. Excel software helped analyze and summarize findings. Including direct quotes in the narrative reflected participants' views, enhancing the study's credibility and depth. All analytic decisions, from coding to theme development, were documented to create a comprehensive audit trail that tracks the analysis from raw data to final reporting.

3.8 Pilot study

The pilot study took place in Kariakoo before the actual data collection, during this phase interviews with small scale metal workers were conducted to ensure that the research instruments were valid, reliable, and easily understood by the intended audience. Kariakoo was chosen due to its accessibility to the research team's location. This process enhanced the quality and accuracy of the data collected for the primary investigation**.**

3.9 Ethical clearance

The institutional review board (IRB) at Muhimbili University of Health and Allied Sciences (MUHAS) provided ethical approval (Ref.No.DA.282/298/01.C/2223). After receiving Ethical approval and an introduction letter from the director of postgraduate studies, the Regional Authority Secretary granted permission to conduct data collect from these two factories. Participants were briefed on the study objectives, and no incentives were offered for participants and prior to the interview, participants were requested to provide written informed consent. Participant involvement was entirely voluntary, and they also had the freedom to decline or terminate the interview at any point.

During the study, strict confidentiality was upheld and this was done by anonymizing, secure storage and participant information were only accessible to authorized personnel involved in the study, and no personally identifiable information of participants was documented. Permission for capturing workplace photos and clear images of workers was sought from the respective individuals within factories. The generated information was exclusively used for research purposes. Participation in this study did not pose any risks to the respondents.

CHAPTER FOUR

4.0 FINDINGS

4.1 Introduction

This chapter presents the study findings and is organized in sub sections according to the specific objectives. The objective of this qualitative study was intervention coherence, self-efficacy and barriers. This presentation was structured around the pre-determined themes that were developed based on the specific objectives of the study.

These themes guided the exploration of the acceptability of earplug use among small-scale metal workers. The findings were presented according to the themes of intervention coherence, self-efficacy, and barriers. For each objective, the subthemes that emerged from the data were discussed in detail. These subthemes describe what transpired and provide a detailed elaboration of the themes.

4.2 Social demographic characteristics of study participants

The study involved 12 male participants with their age ranging from 23 to 78 years. Most of them are married and had primary level education and a few had secondary level education. Their experiences of working in the metal industry varied from 3 years to 25 years. See table below

Table 1: Social demographic Characteristics of the study participants

Background information	**Total**	**Number (N=12)**
Age distribution 20 – 25 45 - 80	Number 06 06	Percentage 50% 50%
Sex **12 All male**	**12**	**100%**
Grand total	**12**	**100%**
Marital status Single Married	Number 3 9	Percentage 25% 75%
Grand Total	**12**	**100%**
Education level Primary school Secondary school	Number 8 4	Percentage 67% 33%
Grand Total	**12**	**100%**
Years of experience in the industry 2 – 15 15 - 30	Number 5 7	**Percentage** 41% 58%
Grand Total	**12**	**100%**

Table 2: Summary of the findings

THEMES	SUB-THEMES
Intervention coherence on earplug use	• Understanding on earplugs and their function
	• awareness on earplug handling procedure
Self-efficacy on earplug use	• Confidence in the installation of earplugs
	• Satisfaction in ear plugs use
Barriers to earplug use	• Working environmental barriers
	• Individual barrier
Strategies to increase the acceptability of earplugs	• Need for more educative sessions
	• Need for long-lasting earplugs

Theme 1. Intervention coherence of earplug use among small-scale metal workers

Intervention coherence refers to how individual participants perceive and understand the interventions and how it works. Three distinct subthemes emerged: understanding the meaning of earplugs, the practical functions of earplugs, and the necessity of using earplugs.

Subtheme 1. Understanding of earplugs and its function

The analysis of data revealed that participants were aware of earplugs and its function. They highlighted on what earplug is, its function and why is advised to use earplugs.

Most of the study participants were able to tell what earplug is as some of them said it is a rubber while others said it is a sponge and some went further and state that it is a plastic with a string

and others said that earplugs are equipment made of foam materials while others said that earplugs are devices made up of silicon materials.

"...For my understanding earplugs are equipment's made up by sponge materials to be used in our ears while in noise environment" (IDI- 4-2024)

Earplug functionality: It was also revealed that most of the participants were aware on the functions of ear plugs as Most of the participants reported that earplugs reduces the pitch of noise while others reported that earplugs help in solving hearing problems by preventing deafness, reducing effects of noise on ears and protect them from hearing any kind of hitting. Few of them said that earplugs were used to prevent progressive effect of noise in their ears.

"...We are supposed to wear earplugs because they help to control noise from entering our ear, because when we are on them that the way it helping our ear from being affected by noise which are with us all days in our working environment." (IDI-5-2024)

Appropriate time to wear earplug: Further participants reported on the timing for earplugs use: they reported that they did not use earplugs when making stories with others, when going for lunch break and when using a cellphone. Most reported that they wear earplugs before entering in working environment, and all the time while at noisy scene.

"...The appropriate time to wear earplugs is that time when you arrive in your working environment because every work hear produce noise if not yourself then your neighbor so once you arrive here you must wear your plugs."(IDI-1-2024)

Subtheme 2. Awareness on earplug handling procedure

The analysis of data revealed that participants had an understanding through their ability to remember the instructions given on handling procedures such as time span for earplug use, hygienic practices when wearing earplugs, earplugs storage and disposal.

Study findings revealed that small scale metal worker had diverse knowledge regarding earplug usage time span. Some of the participant said that earplugs should be worn six times then you'll have to replace them with a new one. Most of them reported that earplugs should be used within three days before disposal.

"....Due to our work environment, earplugs should be worn for three days because our working environment is not clean, therefore wearing it for more than three day will make earplugs dirty and unsafe for use so three days are appropriate." (IDI-2-2024)

Earplugs hygiene: Participants were aware on proper hygienic practices when wearing earplug to make them safe for user's ear. Most of them said that the earplugs should be worn using clean hands, and should not be frequently touched after installation in the ear. Some of the participants recited that care is required while wearing it to prevent dirtiness.

"....The main thing I know these things should not catch dust or any other dirty therefore handling them with clean hand is important so that they cannot cause effect to our ears." (IDI- 32024).

Earplug storage: Study findings also reveals that participant had an understand on how properly earplugs should be stored to keep them free from contamination they explained different method they use to store earplugs for later use; Some said that they store them in a clean dry box the same way as it was packed, while others stated that they store them in a first AID box or safe box away from their job attires or in a draw while covering it with a piece of cloth.

"....After finishing work, I take my plugs, wipe them, fold them, and return them to the small bag which I was given, so I place them in the same small bag where they were taken from." (IDI-7-2024)

Disposal of the earplugs: Participants were aware of the methods for properly disposing the earplugs after usage. It was reported that most of them were collecting used earplugs at the management officer where they are replaced with a new one.

Some suggested that earplugs should be burnt or disposed were other rubbishes are disposed. Most of the participants reported that they replace used earplugs from the leader also collect the used earplugs to the messenger for disposal.

"*.... it is required to take the used earplug to the office leader and replace it with the new one but it is more easier to collect all in one container and once it is full they get burnt where other rubbishes are burn this will help because not all the time these leaders are in the office" (IDI-5-2024)*

Theme 2. Self- efficacy of earplug use among small scale metal workers

Self-efficacy' refers to the participants' self-confidence that they can perform the behaviour(s) required to participate in the intervention. Two sub-themes emerged, including the confidence in installation of earplugs and satisfactoriness in earplug usage

Subtheme 1.Confidence in installation of earplugs

Participants were confident on explaining how they install earplug; most reported that installation of earplugs was easy and involved rolling the device to small size then inserting it to the ear followed by holding it in place for about five second to allow it to return to its original size.

"....Ah, when wearing ear plugs, you roll it, it becomes small, you wear it in the right ear, your left hand raises, you pass it over the head, and you must lift the ear. After lifting the ear, you insert, it, after that, you repeat the same steps on the other side , then you hold them with fingers for about twenty second then you remove your finger then you continue with your work, you have worn them well.."(IDI-1-2024)

Subtheme 2. Satisfaction in earplug use

From the analysis of data it was revealed that participant were satisfied after using earplugs as most of them expressed a positive experience with confidence and satisfaction on earplugs use, they were confident on installing and consistently using earplugs.

Study participants reported increased comfort while using earplugs; most of them testified that earplugs helped them feel more relaxed while working in noisy environments and created comfortable working environment by making them feel free from noise, few of them said that they could no longer hear the noisy echo, hence preserving their hearing ability.

"....Ah, once I wear them, I don't hear any type of noise, I just feel normal, and they give me calmness from the noise, I relax." (IDI-2-2024)

Strategy for remember to use earplugs: Study findings reveal that participants employ various strategies to remind themselves for consistently use of earplugs upon arriving at their work areas; Most of them reported that they were self-conscious to protect themselves from the noises in their working environment hence reminded them to wear earplugs while some said that they store earplugs close to their belongings to helps them remember to use them consistently.

"....Me, as me, I usually store my earplugs close to my working attire so that once I take my attire I found them together and that how I remember to wear them, but sometimes these noises around here remind me of my earplugs." (IDI-2-2024)

Theme 3. Perceived barrier of earplug use among small scale metal workers

Barrier refers to the amount of effort required to participate in the intervention. The section has the following sub-themes; working environment related barriers, equipment related barrier, community related barrier and individual related barriers.

Environmental barrier: Participants perceived that their working environment was a barrier to the proper utilization of earplugs. Some of participants reported that there was no source of water closer by to enable them wash their hands before wearing the earplugs. Most reported that dirtiness of their hand made it difficult to install and reinstall the device while working and sometimes they touched greasy materials which complicated the rolling process before installing the earplugs.

"....Another inconvenience, for me personally now I see dirtiness of our environment in relation to unavailability of enough water, at the same time handling metal which have greasy bring difficulty to reinstall earplug since these greasy make our hand dirty"(IDI-8-2024)

Equipment barrier: Participants also complained that earplugs imposed pain due to repeated installation and removal. Most reported discomfort such as itching of the ear after taking off earplugs and some felt difficulties in communicating with co-workers while earplugs are installed. Few participants reported that plug lasts only for three days.

"....Ah, as for me, there are challenges that I experience while on earplugs but these were for the first time I wore them as I was experienced pain and sometimes itching after removing them from my ear"(IDI-5-2024)

One of the study participant reported that earplugs associated with loneliness while on it he went further and say that when you are on earplug you fell the whole area is quit you cannot even hear when others are talking

"....On one side, I feel fine, but on the other side I feel a bit lonely since I cannot communicate with any one. I feel like that place is very quiet, i don't hear any workplace noise, so I feel very lonely. I just see people passing by and talk, but I do not know what is spoken because of these things I am wearing."(IDI -9-2024)

Community barrier: Participant stated that there was bad notion from the community and fellows who are not aware of earplugs. Most of them cited that people in the community mocked them by saying that they wear earplug because they are deaf. Some reported of being bullied by those who are not using earplugs, creating a barrier to use them confidently.

".... For me I thing people who surround us may be the main barrier for the use of earplugs since they call us other names which embarrass us in one way or another."(IDI-1-2024)

Strategies to increase acceptability of earplug use.

This mean that making earplugs more comfortable, convenient, and beneficial, leading to higher usage rates among small scale metal workers as the potential users. Under this the following subthemes emerged. Need for more educative sessions, need for long-lasting earplugs, Need for more action on addressing problems related to noise and need for storage devices and improved mechanism of monitoring and disposal.

Participants emphasized the need for more educational sessions. Many workers expressed a lack of understanding regarding how earplugs function and whether there are any adverse effects associated with their misuse as narrated by some of the participant that they need frequent educative sections on proper use of earplugs and supplying of earplugs, also the other one said that they would like to know effect of these plugs after long time of use, and the other one said that he would like to know where they can get earplug after you guys has stop to provide, Strive to reach more beneficiaries of earplug use, Other metal workers has to be educated about these earplugs.

"....My opinion, me as me is continuation of education sessions, so that we understand how we use them properly, (IDI-4- 2024)

The analysis has revealed that participants need long-lasting earplugs rather than those that expire after a few days because they offer convenience, and environmental benefits. Long-lasting minimize environmental waste, and provide consistent performance and comfort over extended periods, as stated by some of the participant that, earplugs that last for one week will be more convenient and the other said that plugs should be worn for more than a week.

"*….Aaa, my advice is that if there are earplugs which last longer than these could be of help, at least one or two weeks*."*(IDI-10-2024)*

The analysis reveals that participants expressed a significant need for reliable storage devices and improved mechanisms for monitoring and disposal.

Participants highlighted that better storage solutions and monitoring systems would greatly improve overall efficiency, safety, and environmental compliance and this is how they state their need, that they should be provided with equipment for storing the device, and there should be a dustbin for users to collect the device for disposal and the other participant insisted that there should be a responsible person to oversee the use of these devices.

"…. The thing that I can suggest is maybe there should be a dustbin, meaning those who use together all have a common dustbin in one place where they throw all used plugs, and they." (IDI-3-2024)

CHAPTER FIVE
DISCUSSION

5.1. Introduction

This study explored the acceptability of earplug use among small-scale metal workers in Ilala and Temeke at Dar es Salaam Tanzania.

5.2 Intervention coherence of earplug use among small scale metal workers.

The study revealed a high level of intervention coherence, as small-scale metal workers demonstrate a strong understanding of what earplugs are, how they work, and their importance. There is the perception that earplug can not only block noise from entering their ears but also can relives to those who are already affected by noise. This study's findings corroborate the study which was conducted in Ireland which reported that most workers agree that wearing earplugs prevents abnormal hearing, prevents noise annoyance, as workers reported that they believe using earplugs can prevent tinnitus, deafness, difficulty in hearing caused by loud noise, and can protect their hearing, therefore they recommend their uses for workers working in noise environments. Another study conducted in Guimaraes Portugal reported workers perceived the benefits of wearing earplugs as it reduces the volume of noise experienced by the user is possible(45).

On the other hand findings reveal that earplugs should be worn when working in noise environment also before entering noise environment, these findings are in line with the study which was conducted in USA which state that earplugs should be worn whenever working in noise environment with level consistently exceeds 85dB (63). Another finding disclose that earplugs should be stored in a dry, clean and non-dust places, this finding in in line with those from product pulse which states that earplugs should be kept in a clean, dry case to protect them from dust and dirt when not in use. It is crucial to avoid exposing earplugs to extreme temperatures or direct sunlight, as this can degrade the materials, particularly foam and silicone types(64).

Also study findings revealed that earplugs should be disposed in a container where other wastes are disposed and these findings are in line with the study which was conducted in Indonesia which state that, use closed bins to dispose of used earplugs, this prevents contamination and maintains hygiene in the disposal process (65).

These findings are due to the fact that using earplugs can guarantee ear protection and prevent earing problems in the long run.

5.3 Self – efficacy of earplug use among small scale metal workers

Study findings revealed an elevated level of self-efficacy among small-scale metal workers. This was observed in participant confidence to install the device, the comfort they exhibited while using it, and their strategies to remember to use it. These results are in line with most of the studies conducted in developed countries, which reported high self-efficacy of earplug use among workers exposed to high noise levels which is highly influenced by workers having adequate information on the benefits of earplug use, potential harm of noise exposure and proper techniques for insertion and maintenance of the device, but also positive experiences with earplug use such as effective noise reduction and comfort contributed to increased self-efficacy, this presented high level of acceptability. Likewise, the finding reveals participant technique for remember to use earplugs which was storing their earplug close to their working attire, this finding is in row with the study which was conducted in South Africa which also reveal that worker keep earplugs in the same location as essential tools or equipment ensures that they see them whenever they gather their tools, prompting them to use the ear protection(66).

Findings of this study have shown that training provided on the procedure to follow while wearing earplugs, what earplugs are, the importance of using it, was well understood by the participants since participant ca well demonstrate all the procedures to wear earplugs. The findings of this study are contrary to other studies which reported low self-efficacy in earplug use, as reported by a study which was conducted in South Africa which state low self-efficacy among small scale metal workers on earplugs use since workers perceived the device to have side effects causing ear discomfort and need to be thoroughly cleaned before use, and failure to do so may cause ear infections and increase the possibility of hearing loss (67). The differences

in these studies might be due to the misconception of the earplug during training, poor knowledge of earplug handling also influence from co- workers.

Similarly study findings reveal participant increase in relaxation while on earplugs and also improve their sleep during night compare to before when the use of earplugs was not in place, these findings are similar to the study which was conducted in China which reveal the use of earplug increase relaxation and quality of sleep to ICU patient who are exposed to cardiac surgery(68).

5.4. Barriers to earplug use.

Nevertheless, despite the coherence and self-efficacy, the study findings revealed some reasons for dropout from the intervention. A few participants reported difficulties in communicating while wearing earplugs, these findings are in line with the findings from the study conducted in China which reported that small scale metalworkers perceived burden concerning the use of earplugs as they may experience isolation, difficulty communicating (communication barrier), potentially compromising teamwork and safety (69).

One participant also mentioned that being bullied by others while wearing earplugs is another barrier to their use; this finding is supported by the study which was conducted in Ethiopia in 2021 reported various perceived burdens causing discontinuation from use of earplugs by small scale industry workers like feeling uncomfortable, also earplugs interferes with ability to do job as workers reported they can't hear each other, unavailable of earplugs and other workers reported when they wear earplugs, co-workers would make fun of them, therefore making them quite from using it (70).

Another finding for drop out has been community/social stigma as participant narrated that they feel wired in front of those who are not using earplug, this finding is in check with the study which was conducted in that participants who are night clubbers feel wearied to wear earplug especially when they are in the club and others went further and explain that they will star to wear earplug once their parents and relative start to wear it (71).

This study also found that certain socio-demographic characteristics namely age, and working experience contributed to the high level of acceptability of earplug use, that younger small scale metal workers demonstrated a higher acceptance level of earplug use as compared to older metal workers. This finding corroborates with the observation of the study conducted in Australia that indeed, younger age are presumed to be concerned about their hearing capabilities than older age (33) .

Additionally, elder small scale metal workers are more vulnerable to noise than younger ones. This is in line with observations in animal studies which was conducted in United State revealed that older subject had considerably high hearing loss than younger ones after matching with blood pressure, cholesterol, analgesics and exposure profile (72). There is an assumption that younger metal workers still have a long time to work in the factory that could be a reason for their higher acceptability of earplug use with the anticipation that the older ones are going to retire and leave the noise environment.

In this study, findings have shown that less years of working experience contribute to the acceptability of earplugs use, this finding is contrary with the study which was conducted in the United states at Michigan University which reported that workers with more experience had better perceptions of noise exposure and were more inclined to use hearing protection, suggesting that experience plays a significant role in the acceptance and use of earplugs (73). The difference in these two studies might be caused by the fact that, those with more years of experience in this study seem to have become accustomed to the noise compared to those with fewer years of experience, making the latter more insistent on finding replacements for their earplugs once they are gone.

It was revealed that most participants had completed only up to standard seven, with a few having advanced to the secondary level, and this is in a line with a study which was conducted in Canada which reported that gender did not appear to influence the use of hearing protection devices, including earplugs (74).

5.5. Strengths, Limitations and Mitigations of the Study

This study addresses a critical aspect of occupational health by focusing on noise-induced hearing loss (NIHL), which is a common hazard in metalworking environments. Highlighting the use of earplugs can lead to significant health improvements for workers, potentially reducing the incidence of NIHL and improving overall worker well-being.

This study was limited by the use of in-depth interviews, which could introduce interviewer bias and might not fully reflect the true experiences of the participants. To mitigate this, interviews were conducted in Kiswahili to ensure clear communication and understanding. Additionally, pre-testing of the study tools was performed to ensure that the questions were clear and relevant, therefore enhancing the quality and precision of data collection.

The limitation of response bias, where participants might give socially desirable answers instead of their true experiences, was addressed by creating a comfortable and non-judgmental interview environment. This included encouraging open and honest responses and ensuring the confidentiality of their information.

Recall bias could be a limitation, as some of the participants had difficulty accurately recalling past experiences and challenges. This limitation was addressed by designing interviews with specific guided questions, and participants were asked to provide specific examples from their experiences up to one year, which can help enhance the accuracy of their responses.

The subjectivity that might be posed during data analysis is another limitation which could affect the reliability and validity of the findings. To reduce this limitation, thematic analysis was utilized, involving steps such as transcription, familiarization with the data, coding, and theme development. To ensure consistency and accuracy, transcripts were initially coded by more than one person.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study findings among small-scale metal workers revealed a good understanding of earplug use and its function. While participants generally recognized earplugs as devices made up of silicon material and it is used to reduce amount of noise and protect hearing, there were varied perceptions regarding their specific benefits. Clear education on earplug benefits is essential to ensure uniform understanding among workers. Participants acknowledged the necessity of earplug use in noisy environments, but there were differing opinions on when to wear them, indicating a need for consistent guidelines. Additionally, although many workers displayed an understanding of proper earplug handling, inconsistencies in their practices were noted. This underscores the importance of continuous training to promote adherence to best practices.

Despite experiencing challenges such as discomfort and communication issues, participants expressed overall satisfaction with earplug use. They emphasized the need for improvements in design to enhance comfort and functionality. However, obstacles like unclean working environments and social stigma associated with earplug use were identified, highlighting the necessity for comprehensive strategies to tackle these challenges effectively.

Participants called for increased education, long-lasting earplug, improved monitoring mechanisms to enhance intervention's success. By addressing these barriers and implementing targeted strategies, we can enhance the acceptability and effective use of earplugs among small-scale metal workers, thereby protecting their hearing health in noisy environments.

6.2 Recommendations

1. Study findings revealed that small scale metal workers had varying understanding of what earplugs are therefore occupational health professional should conduct regular training sessions to improve understanding and correct usage of earplugs also emphasize the importance of ear protection, proper installation, and maintenance. Provide guidelines and

demonstrations on proper hygienic practices for handling, using, and storing earplugs. Lastly develop strategies to remind workers to consistently use earplugs, such as posters in the workplace.

2. Regarding employers' responsibility in ensuring proper earplug use, they should establish a supportive workplace culture that promotes open discussions about hearing safety. This approach can enhance employees' confidence and comfort in using ear protection. By working closely with policy makers, employers can create a safer, more health-conscious environment that prioritizes the well-being of all workers.

3. The study identify that there were varying understand on the procedures of wearing earplugs therefore workers are recommended to share knowledge and experiences about the benefits and proper use of earplugs with colleagues to improve overall understanding and compliance, on the other hand workers are required to take personal responsibility for their health by consistently using earplugs and following best practices for their use and maintenance. They should not hesitate to ask for help or clarification on the proper use of earplugs from supervisors or occupational health professionals. Lastly small-scale metal workers are recommended to provide feedback on any difficulties or barriers encountered with earplug use to supervisors or health professionals, so these issues can be addressed.

6.3 **Basis for further research**

This study may serve as a base for future studies in different regions in Tanzania to identify the primary barriers such as comfort, accessibility and environment that prevent small-scale metal workers from using earplugs consistently.

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APPENDICES

Appendix I: Consent Form

Dear Participant,

I am Evaline Damasi Asenga from Muhimbili University of Health and Allied Sciences pursuing a Master's of Science in Environmental and Occupational Health (MSc.EOH). I am conducting a study on exploring the acceptability of earplug use among small scale metal workers in Dar es Salaam-Tanzania".

Consent to participate in this study:

My name is Evaline Damasi Asenga, conducting a study on exploring acceptability of earplug use among small scale metal workers in Dar es Salaam-Tanzania. Therefore, I request you to answer some questions that will help me to explore information concerning the mentioned topic.

Purpose of the study:

The study is performed as partial fulfilment of the requirements for completion of the degree of Masters of Science in environmental and occupational health with a topic on acceptability of earplug use among small scale metal workers in Dar es Salaam-Tanzania. You are kindly asked to participate in this study so as to facilitate achievement of the above objective because you may have the appropriate answers required in this study.

Kindly I ask you to be honest and truthful for the betterment of the results that will lead to improved intervention and recommendations for future plans.

What to expect once you accept to participate

If you agree to participate in this study, you will be interviewed in order to answer few questions in the already structured questionnaire prepared specifically for this study. The interview will take almost 30 to 45 minutes and audio tape recorder will be used also to aid in capturing information that you will provide.

Confidentiality:

I would like to assure you that all information collected will be confidential. Only people working in this study will have access to the information. We will not use names on the records of the information you provide.

Risks:

No harm is anticipated to come upon you by joining this study.

Rights to withdrawal and alternatives

Taking part in this study is completely at your will. If you choose not to participate in this study or if you decide to stop participating in the study you will not get any harm. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Benefits:

The information you provide will help in portraying a clear picture on acceptability of earplug use among small scale metalworkers in Dar es Salaam. This will help in planning and provision of services by the government of our nation.

Who to contact

If you ever have questions about this study, you may contact the Principal Investigator, Evaline Asenga, from Muhimbili University of Health and Allied Sciences (MUHAS), P.O.Box 65001, Dar es Salaam, tell +55692484266

If you ever have questions about your rights as a participant, you may contact Dr. Nahya Masoud, Chairman of MUHAS Research and Publications Committee. P.O. Box 65001 Dar es Salaam, Tel 0221503026

I ……. I have read and understood what is stated on this form and my questions have been answered correctly. So, I agree to answer the questions that will be asked.

Interviewee signature ……. Date ……

Interviewer signature ……Date ……

Appendix II: Fomu ya ridhaa, kiswahili:

Sehemu A: Fomu ya Taarifa

Kichwa cha Utafiti: Ukubalifu wa matumizi ya plagi za masikio miongoni mwa wafanyabiashara wadogo wa metali Dar es Salaam, Tanzania.

Utangulizi

Habari; Jina langu ni Evaline Damas Asenga kutoka chuo cha Afya na Sayansi Shirikishi cha Muhimbili,

Idara ya Afya ya Mazingira na Kazi. Tunafanya utafiti juu ukubalifu wa plagi za masikio kwa wafanyakazi wa viwanda vidogo vya metali

Fomu hii inaeleza mambo muhimu ambayo unahitaji kuelewa kabla ya kuendelea, unaweza kuisoma mwenyewe au mimi nikasoma kwa ajili yako. Kuwa huru kuuliza maswali yoyote kuhusu utafiti huu kabla ya kuendelea, na nikishajibu maswali yako yote utafanya maamuzi ya kushiriki au kutoshiriki katika tafiti hii. Kama utachagua kushiriki, utahitajika kuweka sahihi kwenye fomu hii na utapatiwa nakala ya fomu hii ubaki nayo.

Dhumuni la Utafiti:

Dhumuni la utafiti huu ni kuandika kuhusu ukubalifu wa plagi za masikio kwa wafanyakazi wa viwanda vidogo vya metalia ambayo itawasaidia kupunguza madahara ya uziwi yanayo sababishwa na kelele zinazo zalishwa katika maeneo yao ya kazi.

Mchakato:

Ikiwa utakubali kushiriki katika utafiti huu, nitazungumza nawe kuhusu uelewa wako juu ya namna utavyoweza kudhibiti kelele zinazo zalishwa katika eneo lako la kazi na Mrejesho wako utasaidia watunga sera na wasimamizi wa afya kazini katika kufanya maamuzi juu ya njia salama ya kuwalinda wafanyakazi wadogo dhidi ya kelele zinazozalishwa katika maeneo yao ya kazi. Ninakuhusia kuwa mkweli na kutoa taarifa muhimu zaidi. Mazungumzo yetu yatachukua takriban dakika 45 mpaka 50.

Uhiari wa Kushiriki:

Tafadhali fahamu kuwa ushiriki wako katik autafiti huu ni wa hiari kabisa, taarifa utayotoa haitamfikia muajiri wako au kiongozi wako. Pia, unaweza kusitisha ushiriki wako muda wowote kipindi cha mazunguzmo yetu na hata hatua za mbeleni. Maamuzi yake hayaathiri kitu chochote kuhusu mambo yako binafsi hasa hasa kazi yako.

Usiri:

Taarifa itayokusanywa itahifadhiwa kwenye kompyuta yenye nywila na zitatumika kwa ajili ya utafiti huu pekee. Hakuna mtu ataye patiwa taarifa hizi isipokuwa timu ya utafiti tu. Wakati wa kuandika ripoti, taarifa zote zitazokutambulisha zitaondolewa kama vile jina na nafasi yako ya kazi.

Faida na Hasara:

Hakutakua na faida ya moja kwa moja kutokana na ushiriki wako katika utafiti huu, isipokuwa kama ilivoainishwa kuwa utachangia katika kutaarifu wafanya maamuzi juu ya nini kifanyike ili kuendelea kuboresha Zaidi afya za masikio za wafanyakazi wadogo wa viwanda vya metalia. Pia, hakuna hatari juu ya ushiriki wako isipokua inawezekana baadhi ya maswali yakawa sio huru kwako kujibu, inaruhusiwa kupumzika ikiwa unahitaji. Hata hivyo, haulazimiki kujibu maswali yote.

Fidia:

Tafadhali fahamu kuwa hutalipwa fidia yoyote kwa ushiriki wako katika utafiti huu.

Nani wa Kuwasiliana Naye?

Kama una swali lolote kuhusu utafiti huu, tafadhali wasiliana na Evaline Damas Asenga (Mtafiti

mkuu) kupitia simu; +255692484266 na barua pepe; evalinemateshi@gmail.com

Na kama una swali lolote juu ya haki za ushiriki wako, wasiliana na Dr. Nahya Masoud

Mkurugenzi wa Kamati ya Tafiti wa Chuo cha Afya na Sayansi Shirikishi cha Muhimbili S.L.P 65001, Dar es Salaam na simu : 022150326.

Je, una swali lolote?

Sehemu B: Fomu ya Ridhaa:

Baada ya kusoma taarifa zote zinazohitajika, je umeridhia kushiriki katika utafiti huu?

Je, uko tayari kushiriki mahojiano haya? (Weka alama kwenye jibu la mshiriki)

☐ Ndio ☐ Hapana

Ridhaa ya Kurekodi

Wakati wa mahojiano nitakua ninaandika ili kuweka kumbukumbu ya maoni yako. Lakini pia nitarekodi mahojiano yetu yote niweze kuweka kumbukumbu ya kila kitu unachokisema ili nisihofie juu ya kuandika kila neno katika karatasi. Tafadhari usijali juu ya hili, mahojiano yetu yatabaki kuwa ni siri na yatatumika kwa ajili ya utafiti huu tu na si vinginevyo.

Je, unakubali nirekodi mahojiano yetu?

Je, uko tayari nirekodi mahojiano yetu? (Weka alama kwenye jibu la mshiriki)

☐ Ndio ☐ Hapana

Sahihi ya Mshiriki Tarehe

…… ……..

Sahihi ya mtafiti/anayehoji Tarehe

……. ……

Appendix III: Interview Guide with metal workers - English Version

Good morning/Afternoon. My name is……. And this is……. (If two people are present) I/we are from Muhimbili University of Health and Allied Sciences. Thank you for giving me/us your time. We will do about 40 – 60 minute interview that will be tape recorded, transcribed, and then edit it into something we call a "profile that will include only your words, with my questions edited out. The interview will focus on your acceptability of earplug use among small scale metal workers in Dar es Salaam.

Completed consent form;

Yes ☐

No ☐

Note: If consent not obtained thank the participants and do not proceed.

General information's

a) Age

b) Sex

c) Marital status

d) Level of education

e) Years of experience

Theme I: Perceived intervention coherence of earplug use

1. What do you understand about earplugs?
    - Where did you get this information?
    - From who did you get this information?
    - When was this?
    - What he/she said about earplugs?

2. Could you please explain why are you required to wear earplugs?

- Why do you think it is important to wear earplugs?
- When was your first time to wear earplug?
- Who is required to wear earplug and why?
- What can you tell others about the use of earplug?

3. In your understanding, when is the appropriate time to wear earplugs?

- When you are not supposed to wear earplugs and why?

5. After work, how do you store your earplugs for later use?

- Can you explain how hygienically your storage is?
- Where can you recommend others to store their earplug and why?
- What do you need to properly store your earplug?

5. In what way do earplug help you during your daily work?

6. After three days of use how do you dispose earplugs?

- What do you think is needed to properly dispose earplug after use?
- Why do you think it is important to properly dispose earplug after use?

Theme II: Perceived self-efficacy of earplug use.

1. Could you please explain to me how do you wear earplugs?

- How do you feel when you are on earplugs
- What make it easy to use earplug?
- How difficult is wearing earplug?

2. What do you need to properly wear earplug?

3. Can you think of any strategies or tips that might help you remember to use earplugs regularly?

4. What do you think might affect fitting of earplug while wearing it?

Theme III: Perceived barriers of earplug use.

1. What challenges do you encounter when using earplugs?
    - What discomfort do you get when using earplug?
    - How do you manage communicating while using earplug?
    - What sacrifices do you make while using earplug?
2. How the use of earplugs did changed your daily metal work?

   If you were to receive further training on the use of earplugs, what specific aspects would you like to learn more about?

Thank you very much. Now, I would like to hear your overall opinion on what should be done to ensure proper usability of earplugs among small-scale metal workers.

Kindly share anything relevant to this topic that I may not have asked about but you believe is important to discuss and include.

Thank you very much for your time and cooperation."

Appendix IV: Muongozo wa mahojiano – Kiswahili

Habari za asubuhi/mchana/jioni.

Naitwa…….. na huyu anaitwa……(Kama mpo wawili) natokea chuo kikuuu kishirikishi cha afya cha Muhimbili.Asante kwa muda wako.Tutafanya mahojiano na wewe kwa muda usiozidi dakika 40 mpaka 60 na mahojiano haya yatatolewa katika mfumo wa sauti na kuwekwa kwenye mfumo wa maandishi na maandishi hayo yatahusisha taarifa ulizozitoa tu na maswali uliyoulizwa.

Mahojiano haya yatajikita Zaidi katika kujua ukubalifu wa matumizi ya plagi za masikio miongoni mwa wafanyakazi wadogo wa metalia in Dar es salaam.

Pia tungependa kuelewa changamoto mlizokutana nazo wakati wa kutumia plagi za masikio

Umesaini fomu kukubali kushiriki mahojiano haya?

Ndio ☐

Hapana ☐

Kumbuka; Kama mshiriki hajajaza fomu yakukubali kushiriki,mshukuru kwa kushiriki na usiendelee na mahojiano

Maswali ya jumla

I. Umri

II. Jinsia

III. Hali ya ndoa

IV. Kiwango cha elimu

V. Umri wa kufanya kazi

Mandhari I: KIWANGO CHA UELEWA WA MATUMIZI YA PLAGI ZA MASIKIO:

1. Unaelewa nini juu ya plagi za masikioni?

    - Umepata wapi hizi Taarifa Kwa mara ya kwanza?
    - Kutoka kwa nani ulipata hizi taarifa?
    - Ilikuwa lini ulipo pokea hizi taarifa?
    - Aliyekupa taarifa alisema nini juu ya plagi za masikio?

2. Tafadhali nielezee kwanini unatakiwa kuvaa plagi za masikioni?

    - Kwanini unadhani ni muhimu kuvaa plagi za masikioni?
    - Lini Ilikuwa mara yako ya kwanza kuvaa plagi za masikioni?
    - Je ni nani hasa anatakiwa kuvaa plagi za masikioni
    - Kwanini unahisi yeye ndio anatakiwa kuvaa plagi za masikio?
    - Unaweza kuwaambia nini wengine juu ya matumizi ya plagi za masikio?

3. Kwa uelewa wako muda gani ni sahihi kuvaa plagi za masikioni?
    - Kwanini unawaza huo ndio muda sahihi wakuvaa plagi za masikio
    - Ni muda gani hautakiwi kuvaa plagi za masikio na kwanini?
4. Baada ya kazi unatunza vipi plagi zako za masikio kwa matumizi ya baadae?
5. Naomba nielezee nikwanamna gani unahisi utunzaji wako wa plagi za masikio ni salama?
    - Ni sehemu gani unaweza washauri wenzako watunze plagi zao za masikio?
    - Kwanini unahisi sehemu hizo ni salama?
    - Unahitaji nini ilikuweza kutunza plagi zako za masikio vizuri?
6. Ni kwa namna gani plagi za masikio zimekusaidia wakati wa utendaji kazi wako?
7. Baada ya siku tatu za kutumia plagi za masikio unazitupa wapi?
    - Unadhani nini kinahitajika kuweza kuzitupa kwa usalama baada ya kuzitumia?
    - Unadhani kwanini ni muhimu kuzitupa kwa usalama baada ya kuzitumia?

Mandhari II: UWEZO BINAFSI WA KUTUMIA PLAGI ZA MASIKIO

1. Tafadhali nielezee namna ya kuvaa plagi za masikio

- Unajisikiaje ukiwa umevaa plagi za masikio?
- Ni kitu gani kinafanya urahisi kutumia plagi za masikio?
- Je nikitu gani kinaleta ugumu katika uvaaji wa plagi za masikio?

2. Unahitaji nini iliuweze kuvaa vizuri plagi za masikio?

3. Unaweza kufikiria mbinu yoyote ambayo inaweza kukusaidia kukumbuka kuvaa plagi za masikioni?

4. Unafikiri nikitu gani kinawezakukufanya ukashindwa kuziweka vizuri plagi zako za masikio mda unapozivaa?

Mandhari III: VIKWAZO VYA KUTUMIA PLAGI ZA MASIKIO:

1. Je ni matizo gani unakutana nayo wakati unapotumia plagi za masikio?

- Ni usumbufu gani unaupata unapokuwa unatumia plagi za masikio?
- Unawezaje kufanya mawasiliano wakati unapokuwa unatumia plagi za masikio?
- Je nivitugani unaamua kuvitoa sadaka iliuweze kutumia plagi za masikio?

2. Nikwa namna gani matumizi ya plagi za masikio vimebadilisha utendaji kazi wako (kuathiri utendaji kazi wako).

-Ikiwa utatakiwa kupata mafunzo Zaidi juu ya matumizi ya plagi za masikio nikitu gani hasa ungependa kijifunza Zaidi?

Asante saana, sasa ningependa kusikia maoni yako Kwa ujumla juu ya nini kifanyike kuhakikisha matumizi sahihi ya plagi za masikio miongoni mwenu.

Nikuombe unishirikishe chochote kinachohusiana na hii mada ambacho naweza nikawa sijskiuliza lakini unaamini nicha muhimu kukijadili na kukiongeza.

Asante saana kwa wakati wako na ushiriki wako.

ATTACHMENTS

EVALINE DAMAS ASENGA,
evalinemateshi@gmail.com,
+255692484266,
DAR ES SALAAM.

11/3/2024.

TO: DIRECTOR OF POST-GRADUATE STUDIES,
P.O.BOX 65001,
MUHAS.

UFS: DEAN, SCHOOL OF PUBLIC HEALTH AND SOCIAL SCIENCES,
MUHAS.

Forwarded 11/3/2024

UFS: HOD, DEPARTMENT OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH
MUHAS.

Forwarded for further 11/3/2024

UFS: DR EMMY METTA - SUPERVISOR
MUHAS.

Forwarded with Supported for Consideration 11/03/2024

Dear Sir/Madam,

REF: SUBMISSION OF RESEARCH PROPOSAL FOR ETHICAL CLEARANCE

Please refer to the heading above,

I am Evaline Damas Asenga, a Master of science Environment and Occupational Health candidate with registration number HD/MUH/T.853/2022. I am requesting for submission of a proposed study titled **"Acceptability of earplug use among small scale metal workers in Dar es salaam Tanzania"** (Part of Intervention study) to the MUHAS IRB.

Thank you for your cooperation.

Sincerely

Evaline Asenga

11/3/2024.

UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – RESEARCH, PUBLICATIONS AND INNOVATIONS

Ref. No.DA.282/298/01.C/2223 Date: 08/05/2024

MUHAS-REC-05-2024-2223
EVALINE DAMAS ASSENGA
SHOOL OF PUBLIC HEALTH AND SOCIAL SCIENCES
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: ACCEPTABILITY OF EARPLUG USE AMONG SMALL - SCALE METAL WORKERS IN DAR ES SALAAM TANZANIA.

Reference is made to the above heading,

I am pleased to inform you that the Chairperson has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE: 08/05/2024
EXPIRATION DATE OF APPROVAL: 08/05/2025

STUDY DESCRIPTION:
Purpose:
The purpose of this exploratory qualitative case study is to explore the acceptability of earplug use among small-scale metal workers in Dar es Salaam, Tanzania.

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided: https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%2015534.pdf and in the MUHAS archives.

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain Data Transfer Agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain Material Transfer Agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country.
8. Apply for and obtain permission to publish the results from National Institute for Medical Research. The application should be before submitting to a publisher and not concurrently through the email publications@nimr.or.tz.
9. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)
10. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
11. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.

Muhimbili University of Health and Allied Sciences
DIRECTOR
Research, Publications & Innovations
Box 65001

Dr. Nahya Salim Masoud,
Chairperson, MUHAS Research and Ethics Committee

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DAR ES SALAAM SMALL INDUSTRIES CO- OPERATIVE SOCIETY LTD. (DASICO)
USHIRIKA WA VIWANDA VIDOGO D'SALAAM
P.O. Box 4608, Dar es Salaam, Tanzania
Phone:2180019, Web:www.dasico.co.tz Email:info@dasico.co.tz.
dasico1976@gmail.com
DSR38.

Kumb. Na.: DSC/BC/Vol.0198/024. **09 Mei, 2024.**

Mkuu wa Idara,
Idara ya Mazingira na Afya Mahali pa Kazi.
Chuo cha Afya na Sayansi Shirikishi Muhimbili (MUHAS).
Dar es Salaam.

YAH: KURUHUSIWA KUFANYA MAHOJIANO JUU YA VIFAA VYA KULINDA USIKIVU KWA WAFANYAKAZI WA DASICO LTD.

Tafadhali rejea somo tajwa hapo.

Kwa niaba ya Bodi ya DASICO Ltd kupitia kikao chake maalum kilichofanyika tarehe 09.05.2024 pamoja na mambo mengine, pia kilipokea na kujadili barua yako ya tarehe 18.03.2024 yenye Kumb. Na. SPHSS/DEOH/VOL II/02, iliyoomba kufanya muendelezo wa utoaji wa mafunzo, ugawaji wa vifaa vya kulinda usikivu na upimaji wa masikio, pamoja na mahojiano juu ya vifaa vya kulinda usikivu kwa wafanyakazi wa DASICO Ltd.

Hivyo basi kwa barua hii napenda kukufahamisha kuwa Bodi ya DASICO Ltd imeridhia/imekubali ombi hilo na umeruhusiwa kufanya mahojiano, pia bodi inatoa shukrani zake za dhati kwenu kwa utafiti huo ulofanyika hapa kiwandani DASICO Ltd.

Ni matumaini ya Bodi ya DASICO Ltd kuwa utaipokea taarifa hii.

Asante kwa ushirikiano wenu,

09/05/2024

Sifaona M. Mageta.
Katibu/Meneja.
Kny: Bodi ya DASICO Ltd.

MENEJA
USHIRIKA WA DASICO LTD
S.L.P. 4608 DAR ES SALAAM

THE UNITED REPUBLIC OF TANZANIA

PRESIDENT'S OFFICE, REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

TEMEKE MUNICIPAL COUNCIL

In reply, please indicate

REF: ..... Date: 14/5/2024

To the Secretary of Gongagonga ward
Uetenary Sokoni - Temeke

TEMEKE MUNICIPAL COUNCIL

RE: RESEARCH PERMIT: EVALINE SAMIAI ASENGA

Please refer to the heading above.

This is to inform you that, permission is granted to the above mentioned student/researcher from MUHIMBILI UNIVERSITY OF HEALTH to conduct researcher on AND ALLIED SCIENCES

ACCEPTABILITY OF EARPLUG USE AMONG SMALL SCALE METAL WORKERS IN DAR-ES-SALAAM TANZANIA

.....

The study will be conducted from 14/5/2024 to 17/5/2024 2023.

Please give with necessary assistance.

For: MUNICIPAL DIRECTOR
Kny: Mkurugenzi Mtendaji
Manispaa Ya Temeke

92 Mandela Road / Taifa, P.O BOX 46343, Dar es Salaam, Telephone +255222928132, Fax +255222928137, Email: temeke@temekemc.go.tz , Website: www.temekemc.go.tz