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An evaluation of Podiatric intervention with regards to foot self-care practices amongst the independent elderly living in the community

By

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Abstract

Aim: The aim of this study was to identify any significant differences in foot health status and self-care practices after regular visits to the Podiatry Clinic in the elderly population who live independently.

Methods: A multi-centre, non-experimental prospective study was conducted on 109 individuals aged 65 years and above and who made use of Podiatry Clinics within the local Health Centres at Primary Health sector. Patients were recruited by means of an intermediary from different health centres during their routinely scheduled appointment. Two questionnaires were used to screen for foot-related self-care practices and foot-related quality of life namely the Nottingham Assessment for Functional Footcare Revised (NAFF) and Foot Health Status Questionnaire (FHSQ) respectively. Participants were interviewed 4 times over a period of one year at 4-month intervals and asked to answer again the previously mentioned questionnaires. Changes in responses were recorded for analysis. For statistical analysis, data was categorized by gender, age and educational level groups

Results: The normality of the data was tested using the Shapiro-Wilk test and non-parametric tests were utilized. The Kruskal-Wallis Test exhibited a significant improvement in mean NAFF scores and a significant decrease in FHSQ scores from T_0 to T_3. Additionally, the Spearman correlation found that no relationship between mean NAFF and total FHSQ scores. Mean NAFF scores demonstrated that the 85< age group was the only age group to have a non-significant improvement. Both gender groups exhibited significant improvements. Those with post-secondary education are the only educational level group to not have improved significantly. Mean FHSQ scores did not differ significantly between age, gender and educational level groups. Out of the domains of the FHSQ, the only significant difference noted was in Physical Activity domains in all age gender and educational level groups (except for primary and secondary level of education). A significant difference was noted in the Vigor domain in the 75-85 age group.

Conclusion: The findings of this study suggest that in the independent living older adult population, visits to the podiatry clinic have been shown to improve foot-related self-care practices

over a period of 1 year. This was observed by the higher frequency of positive footcare behaviours by the NAFF. On the other hand, the results show that foot-related quality of life did not improve in the sample population. Physical activity was the major aspect that the sample population regressed in. The findings of this study imply that improvement in the domains of the FHSQ are not dependent only on visits to the podiatrists and ability to self-care. There could be other intrinsic and extrinsic factors other than podiatric interventions that could influence the quality of life. It is important that podiatrists remain the first point of care when it comes to foot health however adopting a multidisciplinary approach is imperative so as to care for patients holistically.

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Self-Care is giving the World the Best of You, instead of what's left of You

Katie Reed

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CHAPTER 1

INTRODUCTION

1.1. Preface

Humankind has always sought to find ways to challenge adversity and push the boundaries of what they are capable of in every aspect imaginable. In recent times with the advancements in technology and medicine, global demographics have been affected by a reduction in mortality rate (Crimmins, 2015). This resulted in people living longer than before. This global phenomenon, while positive from a humanitarian standpoint, puts pressure on different systems in the modern day be it familial, social, economic and healthcare systems (Lunenfeld & Stratton, 2013).

Malta is no exception, since our aging population is imposing a substantial burden on the healthcare system, long-term care and labour market (Formosa, 2019). Due to the increase in vulnerability that comes with ageing, the modern healthcare system aims to be able to diagnose, treat and manage the elderly population. Podiatry is one such example which caters heavily for the population of older adults (Vernon, Borthwick, & Walker, 2011). For this reason, the podogeriatric team within the Maltese government sector is considered one of the strongest teams as it is the most widely offered service (Government of Malta, 2021). Currently, in the local healthcare system, podiatric services are offered free of charge to everyone within the public sector. From a geriatric perspective, those patients living with long-term comorbidities are given a higher priority for podiatric treatment and care to better improve their quality of life (Harrison-Blount, Nester, & Williams, 2019a). This logic is due to the fact that people living with comorbidities and long-standing conditions such as type-2 Diabetes are at greater risk of limb loss compared to healthier individuals (Boulton et al., 2008).

1.1.1. Aging Population and Independent Living

As previously stated, the ageing population has increased worldwide; 9% of which are above 65 years old (amounting to 728 million people worldwide), with 60% of which are above 80 years old in the year 2020. This figure, which represents high-income countries such as Europe (due to medical advancements), is only expected to double by 2050 (Kanasi et al., 2016). Healthcare utilisation has thus increased and will continue to do so in the upcoming years. That being said,

the necessity for greater population health management will be greater as well, incorporating the use of properly funded healthcare programs that are easily accessible to everyone (Tkatch et al., 2016).

Most older people prefer to age in their private homes and are hesitant to move into a long-term facility due to their perceived notion of being less personally independent. The meaning of the term independence is subjective, depending on the individual in question. Jestes et al. (2019) describe the independent elderly as those who are still both cognitively and physically functional with access to services such as healthcare. However additional components have been identified such as financial stability, autonomy and personal space. In a qualitative study conducted by Hillcoat-Nallétamby (2014), some individuals expressed their interest in having personal time to themselves which would not be feasible in a long-term residential setting.

Based on previous studies, health and function are deemed two of the most important factors for older adults to maintain an independent living lifestyle (Ahlqvist, Nyfors, & Suhonen, 2016). Other contributing factors include social environment, personal traits, resources and living circumstances. Improving the home environment is always relevant in active ageing strategies incorporated by governments, as growing adults feel more autonomy and dignity when within their own homes which in most cases, they would have built themselves or have most probably have an emotional attachment (Galof & Gričar, 2017). It is thus within the best interest of all parties involved (patients, relatives, medical staff and support services) that healthcare professionals aim to support and maintain these personal and surrounding attributes while minimising those factors that threaten independent living (Ahlqvist, Nyfors, & Suhonen, 2016).

The ability of an older person to perform Activities of Daily Living (ADL) is key to assessing his/her function capacity. Enhancing Activities of Daily living improves the quality of life with the added benefit of reducing the burden on support services and caregivers (Mlinac & Feng, 2016). In a study conducted by Galof & Gričar (2017) to identify associations between ADL and home environmental factors, a negative correlation was identified between these variables with the authors concluding the need for improved home care and adjustments to be safer for the residents.

1.1.2. Podiatric Practice and Intervention

Podiatry forms part of the multidisciplinary team that the elderly population frequently require the service of as part of their high quality and holistic healthcare. The Podiatric profession encompasses the diagnosis, treatment and management of various foot and ankle injuries and disorders (ranging from musculoskeletal, dermatological and vascular conditions) (Harrison-Blount, Nester, & Williams, 2019b). It is believed that foot pain is relative to the presence of kinematic or anatomical impediments for which treatment should aim to correct or at least reduce the effect (van der Zwaard et al., 2013). Possible treatment for such pain involves the fabrication of orthotics (Root et al., 1977), physical exercise and over the counter medication as needed by the presenting complaint.

The objective of podiatric practice is to focus on clinician-led development of sustainable and evidence-based foot care services that improve in quality, safety, and accessibility (Harrison-Blount et al., 2019). As such, a plethora of patient-centered interventions are provided by podiatry clinics that meet the patients' needs such as the provision of insoles, footwear and routine care such as the treatment and management of painful or pathological dermatological lesions and nails (Torrens et al., 2019). The podiatric profession has been integrated within primary, acute and community care with adequate training to aid manage and prevent foot complications even in cases where patients live in certain long-term conditions in order to maintain function and mobility (The College of Podiatry, 2017). Throughout the consultation visit, advice and information regarding proper self-care ways which they can perform while in an independent home setting. Such advice covers foot inspection, nail and skin care, footwear and management of the aforementioned comorbidities as required (James, Orkaby, & Schwartz, 2021).

Podiatrists regularly make use of specific devices that are essential to perform diagnostic and monitoring examinations especially for older patients who may also live with certain comorbidities and long-standing conditions most commonly Type 2 diabetes mellitus. A basic foot exam incorporates vascular, neurological and biomechanical assessments as part of their foot care regimen (Lepäntalo et al., 2011). Specific tools may be opted for testing and monitoring such as monofilament and tuning fork to test for healthy peripheral touch sensation while a Doppler

ultrasound is used in Vascular testing to assess blood flow to the lower extremities. The aforementioned serve to prevent foot complications such as ulceration and amputations which would otherwise compromise the quality of life, especially in older adults (Song & Chambers, 2021). Assessments and treatment modalities however may vary between settings and even countries as policies and regulations are not necessarily the same thus influencing the level of service received by the patient (Soliman & Brogan, 2014).

1.1.3. Podiatry in Malta

Podiatry on the Maltese islands is an ever-growing profession that adopts the services as stated in the above segment. Prevention and treatment are often achieved through education and form a fundamental part of the profession through practitioner and patient interaction (The Association of Podiatrists of Malta, 2021).

In the local setting, the podiatry service is easily accessible within both the government (in primary, hospital and community settings) and private sector (Government of Malta, 2021). For those individuals actively living in the community, the service can be accessed through the Primary HealthCare within Health Centres. The mission statement of the Primary HealthCare is to provide the highest quality of integrated primary health while continuing to explore further ways to reach the service to more people in the community (Government of Malta, 2020).

Podiatry is one of many health services offered within the Primary healthcare setting with different specialities catering to a variety of patients as follows: Core Podiatry (routine assessment and treatment of dermatological, biomechanical, vascular, neurological and nail pathologies), Gait Analysis, Screening, Podopaediatrics, Rheumatoid, Diabetes, Nail Surgery, Wound Management and Podogeriatrics (Government of Malta, 2020). Core podiatry is offered within each Health Centre and small district clinic across Malta and Gozo while the other specialty clinics are offered

at specific centres (Primary HealthCare, 2021). When making an appointment with a podiatrist, older patients are directed to the core clinic. After the initial foot assessment, referrals to other speciality clinics can be done if deemed necessary.

A local study has shown that patients are overall satisfied with the level of service provided at Primary Care clinics with varying opinions between localities (Meilak, 2009). However, it should be noted that today there are far more podiatry clinics and podiatrists than in the year of publication of the above-mentioned study. This means that now there is a greater outreach for patients across the Maltese islands.

1.1.4. Self-Care Practices

From well before healthcare systems have been put in place, people have relied on self-care to maintain a healthy life. Today, self-care has been well incorporated into everyday life through social and cultural norms and remains a crucial component adjacent to care provided by medical professionals (Narasimhan, Allotey, & Hardon, 2019). Primary Health Care Professionals (HCP) are typically an individual's first point of contact within the health system and offer ongoing services to people with chronic disease (Primary Health Care in Australia, 2016). This opens up substantial opportunities to effect sustainable changes through supporting self-management and delivery of more personalised healthcare services. Importantly, HCPs need to acquire the competencies not only to identify the techniques and tools to adopt for specific patients but also to ensure that the skills are adopted by the patients themselves in order to self-manage (Dineen-Griffin et al., 2019). Kennedy et al. (2013) recommend a whole systems approach to improve self-care practices, which integrates patient-level self-management support and health service organisations, which has proven useful in improving positive outcomes for patient self-care. Effective implementation is profoundly important to ensure viability sustainability, and potential betterment of patient care outcomes (Dineen-Griffin et al., 2019).

1.1.5. Foot-Related Self-Care Practices

In all aspects of healthy living, proper self-care is fundamental to reduce the risk of illness, injury and disease while promoting and prolonging independent lifestyle in the older population. Foot self-care is pivotal for high-risk individuals such as people living with type-2 diabetes due to the fact that they are at greater risk of limb loss (Bai et al., 2009). There is little literature on foot-related self-care in patients who do not have diabetes. Furthermore, self-care education should not be considered only as a prevention for mortality but also to prevent pain and disability in any population (Miikola et al., 2019). Turner (2002) explains that patients attending podiatry clinics are commonly given the following advice: 1) foot inspection, 2) nail cutting or filing, 3) hard skin filing, 4) use of foot cream, 5) foot hygiene, 6) use of socks, 7) use of fastening footwear and 8) use of dressing when required. It is within the role of the podiatrist to make sure that any advice given is properly understood and can be performed by the patients.

A correlation can be easily made between foot-care knowledge, motivation and self-care practices especially when talking about the diabetic foot. Various studies have sought to explore the relationship between these 3 facets with positive results with varying degrees of relationships (Ong et al., 2022). However few researchers have sought to explore foot-care knowledge and self-care in a broader population of older adults. This was further commentated on by O'Connor, Deroche, & Wipke-Tevis (2021), who applied diverse foot-related questionnaires to assess self-care knowledge within this population. They found that older adults were well-versed and capable of performing routine foot care. The levels of knowledge and practice have also increased throughout their study on different follow-ups showing promise in educational programs and workshops. On the other hand, in a local setting, foot care knowledge has been found to be lacking with further deficit in diabetic foot self-care. It was commented that knowledge alone did not provide the need for people to improve their self-care practices (Muscat, 2014). This supports the available evidence found by Goodall (2020) that there is no reliable proof that providing diabetic individuals with foot care education alone is an effective way of improving self-efficacy, self-care behaviour, or self-care knowledge. To promote a healthy self-sufficient lifestyle in the older adult population, motivation is key and if done well will yield positive outcomes (Jaarsma, Cameron, Riegel, & Stromberg, 2017). This research aims and approach has been heavily applied in patients who live

with long-standing comorbidity such as diabetes. Local data on foot self-care in the older adult population is still lacking and for further exploration. Furthermore, there is no research conducted within the local setting that shows the impact of podiatric intervention and consultation on the levels of self-care.

Different teaching approaches have been taken in order to educate and promote self-care knowledge among the elderly population. Such methods involve the use of health promotion programs and workshops that aim to educate older individuals about the importance of foot health and how best to treat and care for them in their private homes all of which have shown positive results (Stolt, Gattinger, Boström, & Suhonen, 2020). A local study conducted by Cutajar (2015) has revealed that such methods are showing favourable results as the needs of older adults are being tackled. However, such outcomes are dependent on the type of interaction also by stabilising the level of motivation and teamwork of the parties involved in the process.

1.2. Research Overview

Research conducted amongst the ageing population is important since this population is more prone to structural changes when reaching a certain age which imposes functional limitations, disruptions to activities of daily living and independence (Carmona-Torres et al., 2019). Ageing brings about a reduction in skin integrity, and muscle mass altering balance with increasing risk of falls, thus increased patient knowledge on foot self-care could serve as a preventative measure to reduce burdens caused by natural ageing. Self-care incentivises the elderly to take control of their life to improve their health and to be more productive and active (Sundsli et al., 2013).

Part of promoting healthy ageing with respect to the feet is to educate about proper foot-related self-care. This is important even for the low-risk ageing population so as to minimise the risk of developing foot pathology and pain in the future which would cause disability and hinder their independence physically, socially and mentally (Miikkola et al., 2019).

This research sought to explore foot health knowledge and self-care practices after a series of podiatry consultations and interventions within the local setting. Furthermore, recent studies and literature will be referenced and used to compare the findings to this study in order to derive explanations for the results obtained. This study hopes to improve the podiatry profession locally with regard to patient education on self-care practices in the older adult population. There has been little progress in the research of foot-related self-care especially within the local context. Moreover, the effectiveness of patient education during and after podiatric appointments has not been well established.

1.3. The Research Question and Hypothesis Testing

1.3.1. Research Question

Before starting any kind of research, one needs to construct a research question. In order to do so one needs to be well versed in the current literature while identifying gaps or uncertainties within the current knowledge (Fandino, 2019). If done correctly, the research question will provide the researcher with guidance in formulating a hypothesis as well as a thorough methodology (Ratan, Anand, & Ratan, 2019).

The research question postulated for this study is:

"Does local podiatric intervention affect Foot health and Self-care practices in older adults living independently within the community?"

1.3.2 Hypothesis testing

Once a research question is constructed, one needs to think about the hypothesis that guides the researcher into answering the question. An adequate research hypothesis is constructed from evidence-based research and established scientific observations (Misra et al., 2021). There are different definitions of what a hypothesis is, some of which include; 1) an assumption to be

approved or disproved by research, 2) a link between theory and the investigation performed leading to information to be added to literature and 3) predictive statements that describe an association between two or more variables (Ranganathan & Pramesh, 2019).

Two types of hypotheses are created for guidance which are in opposition to each other; the null hypothesis and the alternate hypothesis (Stunt et al., 2021). The statement that the researcher primarily believes is fact is known as the alternate hypothesis. In most cases, this shows that there is an association between the variables of interest. On the other hand, what is referred to as the null hypothesis is the statement that states a lack of association between variables (Walker, 2019). For the purpose of this study, the alternate and null hypothesis are as follows:

Null Hypothesis:

The null hypothesis states that podiatric intervention does not affect foot health and self-care practices in older adults living independently in the community.

Alternative Hypothesis:

The alternative hypothesis states that podiatric intervention does affect foot health and self-care practices in older adults living independently in the community.

1.4. Aims and Objectives of the Study

Aim:

The aim of this study was to identify any significant differences in foot health status and self-care practices after regular visits to the Podiatry Clinic in the elderly population who live independently.

Objectives:

1. To evaluate the foot health status in the older adult population who live independently within the community prior to any podiatric interventions.
2. To evaluate the self-care practice of the same population prior to any podiatric interventions
3. To evaluate the impact of Podiatric service on improving foot health status and foot-related self-care practices following 1 year of podiatric interventions
4. To identify any association between foot health education and self-care practices
5. Identify differences in foot health status and self-care practices between different demographic age groups of the older adult population (65-75, 75-85, 85<) living independently within the community.

1.5. Relevance of the study

This research discusses how the ageing process alters the person's overall quality of life through changes in physical, mental and social functioning, over some time. It is expected that by age, these factors will lessen to varying degrees but ultimately depend on individual perceptions and traits. More specifically, insight will be obtained on how knowledgeable the older adult population is and how well they actively take care of their feet. By means of the podiatric follow-up appointments, it is expected that foot self-care practices will increase even if by small amounts. Maintaining a healthy lifestyle improves quality of life and prolongs independent living in the people who are most probably in their retirement period and no longer working (García & Navarro, 2018). Results obtained from this study will reflect the current foot self-care motivation, knowledge and practices that healthy elderly individuals have regarding their own foot self-care. It is also expected to obtain information that reflects the self-care practices of the elderly population before and after podiatric intervention. Additional information derived from the resulting data will also shed light on how well the local healthcare service is able to educate and promote self-care practices in the older population. It is expected that after attendance at podiatric consultations, the levels of knowledge and practice of self-care would be higher compared to the

first visit to the podiatrist. Results obtained from this study should ultimately encourage further research on other methods besides one-to-one education on how to improve education on self-care practices and healthy active-ageing. This research is the first of its kind in this specific population and in the local setting. It should add to the knowledge about the importance of regular podiatric interventions including education to improve foot-related self-care.

1.6. Interest for the Researcher

The topic chosen is of particular interest to the researcher. I am currently employed as a podiatrist at St Vincent de Paul residence and care for elderly individuals who are very dependent on other people for everyday tasks. Self-care is also limited in this specific population, and thus residents are very much dependent on the medical staff and multidisciplinary team. However, there are few exceptional individuals who despite limitations are still committed to taking care of themselves and maintaining their autonomy and identity. This behaviour should thus be encouraged from an age when adults are still physically and mentally capable of taking care of themselves. Early foot self-care education and motivation will transition to more healthy habits during ageing and thus prolong active ageing and maintain physical functional capabilities to a later age.

1.7. Dissertation Layout

- This introduction served as the first step to provide deeper insights into the ageing process while linking to foot-related self-care practices as advised by podiatry practice. This research will explore different factors that may impact the overall level of self-care, be it physiological or psychological.

- The Literature Review chapter describes in detail the current knowledge on the subject. A critical appraisal method has been used in order to compare the findings of the most recent studies while discussing and comparing the strengths, and weaknesses of each. This has been done in order to highlight possible gaps in the literature in relation to this study.

- The Methodology chapter describes in detail the process that ensured the optimal way to gather data while preserving any ethical issues that might have arisen. It described the permissions acquired, the tools chosen for the purpose of the study, the locations chosen for data collection and the procedure used.

- Data obtained from the participants via the two questionnaires has been documented and processed using the SPSS software. Information regarding foot health status and foot self-care has been compared between the 4 intervals to identify changes in scores. Scores have been categorised into 3 different age groups (65<74, 75<84, 85<), 2 gender groups (male and female), and 4 educational level groups (primary, secondary, post-secondary, and tertiary)

- The Discussion chapter gives a critical analysis of the results obtained by comparing similar studies with similar aims and objectives to identify any correlations and similarities. The strengths and limitations of this study have also been mentioned while also showing further gaps that could be explored further in the future.

- The Conclusion includes closing remarks on the relevance of this study. Recommendations are given for further research and possible improvements in daily practice in order to aid the elderly population in taking better care of their feet and themselves.

1.8. Conclusion

The following chapter showcases a critical review of the current literature encompassing different facets of the ageing foot including changes in foot structure and function. Local and foreign demographic data was obtained about the ageing population along with how they are cared for by the podiatric profession. Psychological effects of ageing will also be considered and mentioned as being additional factors in the decision-making process of each individual older adult into motivational self-care. With the current literature regarding foot-related self-care being targeted more to those living with type II diabetes, the general older population is often given less importance (O'Connor, Deroche, & Wipke-Tevis, 2021). Podiatrists in Malta adopt various

treatment modalities to help patients with their foot conditions (Government of Malta, 2021b). However, there is a lack of data regarding how effective the podiatric practice is in promoting self-care in older adults within the local primary care setting. Strategies have been developed by other studies such as workshops that help in teaching patients and in some cases also clinicians on the best way to take care of oneself. These sessions and workshops also aid the clinician in how to effectively motivate and deliver foot care advice (Wazqar, Baatya, Lodhi, & Khan, 2021). However, these methods have not been used in the broader older adult population locally.

CHAPTER 2

LITERATURE REVIEW

2.1. Literature Review

Within the medical field, a strict definition of a literature review has not been described, however, many sources have published guidelines on how to formally and intensively conduct a literature search (Maggio, Sewell, & Artino, 2016). To a less rigorous extent, Maggio, Sewell and Artino Jr. (2016) have described a literature review as *a synthetic review and summary of what is known and unknown regarding the topic of a scholarly body of work, including the current work's place within the existing knowledge*.

Authentic research utilises the literature search to aid formulation of the research question, hypotheses and help construct the methodology. Another key reason to perform a literature search is to identify gaps within the current knowledge of a given topic which could prospectively be amended by one's ongoing study (Grewal, Kataria, & Dhawan, 2016). It thus serves as a critical appraisal of previously performed studies and not just simply a list of facts published (Winchester & Salji, 2016). Through this, researchers learn to delineate the most relevant elements of a given topic and identify relationships and contrasts of different results through critical reasoning (Atkinson & Cipriani, 2018).

A literature search serves as an interaction between the current researcher and the authors of previous studies that share the same topic of interest (Leite, Padilha, & Cecatti, 2019). This review aids the researcher to develop critical judgement which is translated into his/her writing. Not only are the relevant points of previous studies extracted, but the researcher will be able to judge the advantages and disadvantages of previous objectives, findings, and any discrepancies. These points would then be used to empower any argument developed from a current study (Leite et al., 2019).

2.1.1. Research Strategy

In order to conduct a thorough literature research, one must identify trustworthy sources of information that provide studies and research relevant to the one being conducted presently. A literature search is often time-consuming and exhaustive to the researcher which is why thorough

and systematic strategies were developed by different authors with slight variations in between (Bramer, de Jonge, Rethlefsen, Mast, & Kleijnen, 2018). Watson (2020) described that before starting the search for material, 10 key steps need to be taken to facilitate the process;

1) Reflect on the research question,
2) identify concepts (such as population, exposure and outcome)
3) identify synonyms of search terms
4) determine the preferred databases
5) combine search terms
6) limit the search (e.g. to a time period)
7) perform the search and review results
8) adapt search strategy if needed
9) save strategy and results obtained
10) gather materials obtained

For the literature search of this study, a computerised literature search was the main research method used. In order to find relevant information, search engines were used such as Hydi, PubMed, Medline, ScienceDirect, Google, and Google Scholar. Using these sources, keywords were used in the search function such as, 'foot self-care', 'podiatric intervention', 'older adults', 'ageing foot', 'quality of life' and 'patient education'.

2.1.2. Source Information

2.1.2.1. Articles

Articles were chosen if they were deemed to have relevant information regarding foot-related self-care, podiatric intervention and the older adult population. Studies that were published within the last 10 years were favoured as they would publish recent results and implications which could disprove or add upon studies prior. However, some older studies were taken into account in cases that did not have any recent investigations or updates made to the knowledge.

From the articles used, the references found were also reviewed. When an article title was found to have potential relevance to this study, it was looked up for access. When no online source of the article was available, it was either accessed through printed journals at the University of Malta library or the respective author was contacted in order to request the article in question.

2.1.2.2. Other Sources

Other supporting sources of literature that were searched and accessed include medical textbooks, dissertations and printed versions of articles relating to patient self-care, foot self-care, podiatric intervention, older adult population, research design, methods and statistical analysis. These were mainly accessed through the library of the University of Malta.

2.2. Global Ageing Demographics

A country's population is influenced by three determining factors: fertility, mortality and migration (Chang et al., 2020). An increased older adult population is a result of an increase in longevity and a decrease in fertility. On the other hand, migration might decrease the rate of the ageing population (the reason being that migrants tend to be within the working age group). According to the United Nations, every country is impacted by an increased population with an increased proportion of older adults within it (Kudo, Mutisya, & Nagao, 2015). Within the same report, it is stated that the 65< age group is increasing more rapidly than any other age group. It is expected that this phenomenon will continue to increase by 2 billion by the year 2050. By this year, this predicted figure would amount to 21% of the global population with life expectancy to increase to 75 years (Kudo, Mutisya, & Nagao, 2015). In 2018 the population of older adults already surpassed that of 5-year-olds and is expected to surpass adolescents in the coming years (Chang et al., 2020). This phenomenon is attributed mainly to more developed countries with higher income rates. An Australian study has deduced that an average 65-year-old individual is expected to live approximately 19.5 additional years in 2015 which marks an additional 7 years from what was expected in 1960 (McPake & Mahal, 2017).

The increase in the ageing population has great implications for healthcare systems worldwide especially in high-income countries (Abraham, Lim, Tan, & Cheah, 2022). This is because many countries do not cater only to sick individuals but they also offer preventative care. With population increase comes the increased financial burden of offering preventative care to more older adults who commonly live with chronic diseases (Abraham, Lim, Tan, & Cheah, 2022). Thus, the United Nations has issued a recommendation that countries prioritise public health programmes and improvements for long-term care systems to accommodate the increase in the older population as well as social and financial security for them (United Nations, 2022).

2.3. Maltese Ageing Demographics

These recent years have shown a global increase in life expectancy partly due to the advancements in medical technologies and treatments thus people being able to better manage their medical conditions during everyday life (Crimmins, 2015). According to the latest published census, the total registered population within the Maltese islands amounts to 514,564 marking a 4% increase from the previous year (National Statistics Office - Malta, 2020). Of this population, 18% were within the 65+ age group. The National Statistics Office stated that the age group of 65+ increased by 34,000 within the last decade marking 19% of the entire population of Malta. The female population amounted to a total of 50,200 while the male population amounted to 41,900. In the same report, it was stated that 5% of the same age group were still employed reflecting the willingness to participate within the community (National Statistics Office - Malta, 2019). Additionally, life expectancy for older adults has increased by 4 additional years in 2016 from 2000 (Ministry for Active Ageing, 2022).

Malta has developed management strategies to take care of members of the older population by taking into account diverse issues such as physical, social, mental and financial well-being. The latest strategy for active ageing was planned from 2023 up until the end of 2030 (Ministry for Active Ageing, 2022). This strategy aims to improve and increase resources for older adults on finance planning and on how they can recognise frauds aimed against themselves. Collaborations are to be made with voluntary organisations which encourage more inclusion to the older population and also provide a wider outreach of activities in which they take part in. Regarding

health services, the plan discusses more diverse screening initiatives and more outreach for therapeutic services. For all of these just mentioned, educational services and materials are to be made available and easily accessible by the older adult population that lives both within the community and long-term facilities. Furthermore, training is to be provided for professionals in order to identify when specific services are required as well as to identify any abuse that can develop (Ministry for Active Ageing, 2022).

2.4. Ageism

In geriatric studies and literature, one cannot ignore the principle of ageism which is defined as the prejudice and stereotyping of people simply because they are elderly. This has proven to be a major concern as it questions the individual's integration within society (Iversen et al., 2009). Literature suggests that ageism can be subdivided into 3 factors being: 1) Individual, 2) Social and 3) Institutional elements (Donizzetti, 2019). With regard to healthcare, it has been shown that there are negative effects as a result of ageism. In older individuals living in the community, frailty was scored higher in those who have experienced old age-related discrimination (Zora et al., 2022). It is crucial to address issues leading to discrimination towards older adults; either internal or external factors.

Different studies have been conducted to observe the influence of contact time with the elderly on ageism. One such study stated that more contact time results in more positive attitudes toward ageing (Baozhen Luo et al., 2013). Moreover, Sullivan (2008) found that more quality of contact between people of different age groups was also related to such positive attitudes. Healthcare professionals need to keep this in mind when faced with an elderly patient in order to provide non-discriminatory treatment and care. Better quality of contact is beneficial to prevent psychological issues related to ageism such as anxiety and depression (Kang & Kim, 2022).

The social environment is considered a predictive factor towards attitudes towards ageism. Unfortunately, the elderly experience a higher level of loneliness due to a lack of social integration

(Victor & Yang, 2012). Moreover, increased mortality has been linked with late-life loneliness making it a health issue (Luo et al., 2012). The promotion of social interactions such as community centres and work provides the necessary experience to combat loneliness and improve health outcomes (Goll et al., 2015).

A holistic approach is the heart of healthcare and it is the duty of every type of professional to adopt such an approach towards every patient to be unbiased regardless of their demographics (Strandberg et al., 2007). A local study of Maltese podiatrists has shown that overall attitudes towards the ageing population were positive and perceived that treating the elderly is effective and gratifying (Gobey, 2012). In this study, there were indications of a correlation between podiatrists' knowledge of ageing and attitudes towards older people. However, the sample size was rather small due to the low number of podiatrists working in Malta at the time.

2.4.1 Perspective of older people on ageing

Due to the increase in the ageing population, there may be an increased chance of ageism discrimination towards the elderly, either from other people or from themselves. However, age is not a static category as everyone will eventually experience old age unless death reaches prematurely. One study discussed the cause of such discrimination is from anxiety that younger adults experience about their futures. This resulted in them attributing their fears to older adults of what they believe they will experience in the future (Donizzetti, 2019). However, this is not necessarily the case. In a qualitative study, focus groups of people aged 60 or more were asked about their perception of healthy ageing. The most common themes derived were: self-sufficiency, enjoyable social relationships, independence and an overall joyous feeling. Other identifiable sub-themes that emerged were physical activity, absence of illnesses, good nutrition, fall prevention and good mental health (Halaweh, Dahlin-Ivanoff, Svantesson, & Willén, 2018).

Diehl et al. (2021) have noted that self-ageist perceptions commence at around the age of 65. Such changes are related to the physical, psychological, and social domains of their lives. The authors

of this study followed participants up to 21 years in order to examine the impact of the aforementioned categories depending on the time of onset and the intensity of changes. It was noted that participants generally have age-discriminatory views around the age of 65 with some appearing during mid-life, the reason being due to approaching retirement, loss in physical capacities and possible unachievable goals in the future (Han & Richardson, 2015). It was further commented that such views may be influenced by cultural factors and norms (Barrett & Montepare, 2015).

Changing these negative perceptions to positive ones may produce favourable outcomes as documented by Benyamini and Bruns (2020). They have stated that positive perceptions of self, lead to decreased mortality and improved outcomes in health management (Beyer, Wolff, Freiberger, & Wurm, 2019). This study supports this idea while also leaving room for further research with a more substantial sample size into how exactly the relationship between these two factors interact (Benyamini & Burns, 2020). This idea suggests that perceptions are affected and dependent on biological and social circumstances (Palgi, Shrira, Kavé, Rubinstein, & Shmotkin, 2019). A different study aimed similarly to assess self-perception of ageing as a determinant factor for overall quality of life. A sample that included 55-year-olds demonstrated that positive outlooks and higher levels of self-esteem were associated with a greater quality of life (Ingrand, Paccalin, Liuu, Gil, & Ingrand, 2018). The inclusion of people aged 55 was justified in order to emphasise that measures taken to improve quality of life need to be implemented before old age for greater effect and implementation (Kotter-Grühn & Hess, 2012).

A healthcare professional is integral to health promotion which includes changing someone's perceptions of ageing. A survey conducted with both the public and other medical practitioners has shown that lay people were more likely to view ageing as a sort of pathology albeit not trained to be able to diagnose pathology (Janac, Clarke, & Gems, 2017).

2.4.2 Perspective of Health Care Professionals on Aging

A textbook analysis has shown that information about ageing correlates with the attitude of healthcare professionals towards older adults. Nevertheless, it was still inconclusive whether

physicians view ageing as pathological or not which necessitates further research (Janac et al., 2017). Most literature has discussed the views of ageing from the perspectives of scholars and older adults themselves. However, certain discriminatory behaviours can be elicited by medical staff and other healthcare workers. It is crucial to disprove biases and misconceptions in order to provide the best treatment and health management to older adults (Zhang, Jin, Ma, & Xu, 2022). This issue needs to be addressed during student education for healthcare. A study conducted by Castellano-Rioja et al. (2022) found positive results when exposing students to clinical placements. If during their curriculum of studies, students are exposed to different settings (both hospital and long-term facilities), more positive attitudes are harboured towards older patients. More research is required on the best way to discuss ageism and training with students as most medical professionals will more commonly come in contact with older patients during their practice (Dahlke et al., 2020). This strategy can be also useful even for young adults since they commonly exhibit anxiety about what awaits them in the future. Proper knowledge of the ageing process will reduce these symptoms which in turn reduce any discriminatory behaviour towards older adults (Donizzetti, 2019).

This is further supported by another qualitative study that identified care providers who possess knowledge and experience with older patients are able to advocate well for their health and support even with the increased challenges that come with this increasing demographic (Dev et al., 2020).

In the hospital setting, it was found that older adult patients experience ageist behaviour from both medical staff and students as they have a perceived notion that they are given minor importance as opposed to those of higher mental and physical status. This reflects the level of care and quality of life being delivered to older patients (Samra et al., 2013). Furthermore, patients themselves would not be provided information about their condition and not be involved in decision-making scenarios as their memory and cognitive processing were as deficient (Wyman, Shiovitz-Ezra, & Bengel, 2018). A critique of this study was that a small population of 21 participants was used (Gholamzadeh, Shaygan, Naderi, & Hosseini, 2022). Samra et al., (2015) discussed how the setting itself plays an important role in how students and staff view the elderly. Inadequate organisational systems, lack of training and unrealistic pressures posed by employment entities added to the lack of quality care provided to patients resulting in negative attitudes.

In order to overcome ageism as a border to quality care, communication between professionals and patients is fundamental. Communication in healthcare serves to form a relationship with the patient to agree on the best course of action in a given scenario (Gaffney & Hamiduzzaman, 2022). Some healthcare professionals have been shown to struggle in this regard as they show distant tendencies such as lack of eye contact and non-positive facial expression when talking which result in negative repercussions on the patient. However, a systematic review has shown that professionals showing a genuine disinterest in a field of practice is highly predictive of ageist behaviour leading also to the aforementioned symptoms of anxiety (Wyman, Mary F., Shiovitz-Ezra, & Bengel, 2018)**.**

2.5. Impact of Ageing

Ageing or senescence is described as a chronic yet normal biological process by which cellular degradation occurs causing certain protective and regenerative functions to cease to function at their normal rate and capacity over a prolonged period of time leading to an increased risk of certain diseases (Mchugh & Gil, 2017). Here is a short summary of some of the body functions that are affected by senescence: internal organ systems, neurological, endocrine, musculoskeletal, gastrointestinal, pulmonary, cardiovascular, urological and other senses (Bronson & Prasanna, 2022).

Changes caused by ageing are not limited only to one's physical wellbeing but also in a social and psychological manner amongst others (Mitina, Young, & Zharvoronkov, 2020). It has been shown that physical well-being alone does not necessarily impact life satisfaction however, poor mental health was correlated with lower life satisfaction as certain physical limitations have been described as being more adjusted to (Puvill et al., 2016)**.**

With the advancements in medical testing, the ageing process has been viewed from various aspects even at a cellular level with still more yet to be discovered (Dodig, Čepelak, & Pavić, 2019). Effects of ageing extend also to changes and possible complications that affect the foot. Thus, it is fundamental to invoke self-care practices and management at a younger age to help reduce the impact of morbidity (Miikkola, Lantta, Suhonen, & Stolt, 2019)**.** Having defined the

processes involved in ageing is beneficial to developing support frameworks and strategies. In turn, these strategies are useful for a multidisciplinary approach necessary for disease prevention and to prolong/limit the effects of ageing as much as possible (Li et al., 2021)**.**

2.5.1 Psychology of Ageing

With an increase in functional limitations, a correlation with a lower quality of life has been identified. However, the overall psychological status of the older adult also plays a contributing factor in both residential care and in the community (Atkins et al., 2013). Puvill et al, (2016) however made a distinction that physical function alone did not contribute to lower life satisfaction but specifically the individual's functional status which could lead to symptoms of anxiety and depression. Depression is one of the leading mental illnesses worldwide and it can manifest in major episodes, especially in the later years of life. Studies have tried to link subjective age (or age perceptions of self) to manifestations such as stress, depression, mortality, cognitive function and general well-being. An individual's perceived age is dependent on how he/she feels and has been associated with improved health and positive outcomes of treatment (Mitina et al., 2020). A meta-analysis of depression in this population has shown that levels are high but dependent on different factors. It was discussed that region, available health status and care, economic situation, and social and familial discrepancies have all significant impacts on the prevalence of depression (Zenebe, Akele, Selassie, & Necho, 2021).

Increased social inclusion has been greatly linked with age satisfaction and consequently improved mental status. Living situations in personal residence; living alone or with family members play a key role in inclusion (Nakamura et al., 2022). The availability of friends and being able to attend activities and seek services serve a similar role to family in being able to socialise. Otherwise, social isolation can bring about a lower mental quality of life which could lead to increased mortality (Donovan & Blazer, 2020).

Bowling and Iliffe (2011) state that improving mental health will aid to maximise self-efficacy and resilience. To do so one needs to control psychological factors such as self-esteem, confidence and optimism. When healthcare professionals deal with older adults who face mental health issues,

one needs to communicate with sensitivity to build a good relationship. Doing so will stabilise and achieve positive levels of well-being even on a functional level (de Mendonça Lima & Ivbijaro, 2013). Doing so further improves their quality of life adding to their longevity.

2.5.2. Social Gerontology

Social gerontology is the study of the successful integration of the ageing individual within a social setting (Kricheldorff et al., 2015). This usually incorporates good physical and cognitive function for optimal integration with surrounding people being friends, family, colleagues etc. (Martinson & Berridge, 2015). With time the social circle shrinks with the individual's social role changing with more focus being given to more meaningful relationships. Since physical capabilities become more difficult with age, social activities will also be more strenuous. Thus, it is common for certain people will lead a more isolated life and be unable to participate and enjoy certain leisure activities (Abdi et al., 2019). However, multiple reports have shown that strong social activities are less likely to lead to loss of cognitive function. When confronted with a negative event, individuals with good social support are less likely to experience distress. In regards to health and self-care, this translates to more positive mental status leading to more positive outcomes with higher longevity and less morbidity (Charles & Carstensen, 2010)**.** The benefits of meaningful relationships are further cemented by a systematic review conducted by Smith et al. (2017) to observe the association between social support and physical activity. Most articles have stated that with social support from close people such as family, there is a tendency for more physical activity.

The social needs vary from one person to another however some general points could be considered staples. According to Aroogh and Shahboulaghi (2020), the defining traits of social interaction for older people involve personal satisfaction, interpersonal interactions, participation in activities and resource management. However, there are some differences in social satisfaction between the old and young. Older adults experience more satisfaction with their interactions (with their friends and family) than younger adults and experience loneliness mainly when reaching advanced old age when their functional ability is even more limited (Committee on Aging Frontiers in Social Psychology, Personality, & Adult Developmental Psychology, 2006). A thorough literature review has been conducted to identify the social needs of community-dwelling

older adults. Social integration is multifactorial and promotes active involvement and responsibility, respect with autonomy, promote social events and sharing of knowledge about care for the elderly (Bruggencate, Luijkx, & Sturm, 2018)**.**

2.5.3. Continuity Theory

When addressing patient adherence to treatment and similar self-care practices, one needs to consider the continuity theory. Continuity is defined as a state by which quality is consistent and continuous such as habits and attitudes (Atchley, 1989). This term can be used when changes occur in life and adaptive strategies are created to achieve balance. In the context of normal ageing, the continuity theory describes the set of past conditions and experiences that an older individual has had an influence on present behaviour and decisions (Onega & Tripp-Reimer, 2021). Furthermore, within the context of healthcare, the continuity theory helps develop strategies adopted by both ageing individuals and healthcare professionals that encourage personal growth along with the environment as well as the development of one's own identity (Östman, Ung, & Falk, 2015).

Continuity strategies will help the ageing population to adapt to changes in the context of both social and mental well-being with certain adaptations varying between individuals depending on their personal characteristics such as gender (Ng, Lim, & Hsu, 2021). Keeping in mind the definition of normal ageing and the processes involved, continuity theory explains and encourages older people to meet their own needs in health, income and recreation as independently as possible (Atchley, 1989).

2.5.4. Economical Influence of Ageing population on older adults and healthcare

In recent years due to an increase in the ageing population, healthcare expenses have increased across developed countries such as within the European Union (Jayawardhana et al., 2023). Governmental expenses are elevated when more older people are still within working age, as for them healthcare is required to encourage and support them until retirement age (Cristea, Noja, Stefea, & Sala, 2020). Some of the expenses dedicated to the older population include food, residences, pensions and healthcare. These budgets vary depending on the county and policy

adopted (National Research Council (US) Panel on Statistics for an Aging Population, 1988). On the other hand, in developing countries, there is more economic stress with associated symptoms of depression and lower levels of quality and satisfaction of life in older adults (Yang, Zheng, & Zhao, 2021). More importantly, self-reported good health is lower than in developed countries, all attributed to less healthcare and staff available (Huang, Ghose, & Tang, 2020).

Generally, people of lower economic status experience increased morbidity and mortality due to fewer resources available (Zhang, C., Chung, Zhang, & Schüz, 2019). A multi-country analysis has shown that financial stress is directly correlated with symptoms of depression and lower quality of life and satisfaction (Huang, Ghose, & Tang, 2020). However, research is still lacking on the relationship between wealth and health and what guidelines to best use to combat certain difficulties (Huang, Ghose, & Tang, 2020).

2.6. The Ageing Foot

Normal ageing also referred to as senescence imposes changes in the body's musculoskeletal system and physiology. From a biological standpoint, ageing commonly brings about certain manifestations and changes within the body and its systems such as organs, the neurological system, the cardiovascular system, the pulmonary system, the endocrine system, the musculoskeletal system and more (Flint & Tadi, 2020).

This comes to no exception in regards to the foot. Changes involving foot strength, and balance dermatological and biomechanical changes are very common with age. In fact, the elderly population is faced with a plethora of foot conditions commonly attributed to ageing (Menz, 2012). Most commonly, they are subjected to structural deformities, formation of callouses and corns, infections fissuring and ulceration of the skin (Fuji, 2019). It is well documented that foot pathologies negatively impact the quality of life of the individual. Foot health is multifactorial in nature and should be viewed from different domains such as physical health and footwear (López-López et al., 2021). It is often the case that such conditions when left untreated can cause further discomfort and add to the limitations the individual experiences. It is within the responsibility of

the podiatrist to identify normal foot health and function in older adults to be able to provide the most adequate treatment for a better quality of life (Miikkola, Lantta, Suhonen, & Stolt, 2019).

2.6.1. Nail Disorders

Age-related morphological changes to the nails include thickening or possible thinning of the nail plate. Nails have an increased chance of becoming friable resulting in fissuring, formation of striations and possible splitting (Abdullah, 2011). However, changes to nail structure and appearance might be indicative of other conditions such as ischaemia, neoplasms and infections (Singh et al., 2005). Although nail disorders can present themselves in all age groups, within the elderly population, the frequency of occurrence is higher. Such pathologies include onychauxis, onychocryptosis, onychogryphosis, onychomycosis, subungual haematoma and more. These problems don't always cause pain and discomfort but are more of a cosmetic concern, however, many might find difficulty in cutting their own nails themselves (Abdullah, 2011). Thus, routine visits to a podiatrist might alleviate their discomfort.

Secondary nail changes occur due to systemic effects like poor circulation or biomechanics which impact parts of the nail anatomy such as matrix, bed and hyponychium. In the majority of cases, nail disorders are treated by managing the underlying causes. (Abdullah & Abba, 2011) Have described the following changes and management in older adults:

- Fragalitas Unguium - hydration of the nails with topical phospholipid-rich emollient
- Onychauxis - reduction of nails either by filing or debridement by a professional
- Onychoclavus - hyperkeratotic lesion underneath the nail which can be avoided by reducing minor trauma attributed to ill-fitting footwear causing digital deformities (such as flexion and rotation)
- Onychocryptosis - more uncommon in the elderly mainly caused by poor nail-cutting technique, hyperhidrosis and ill-fitting footwear
- Subungual Haematomas - often painless often caused by acute trauma causing lacerations in the nail bed. Observation is sufficient but in painful cases may necessitate the removal of the nail plate section

- Infections - can incorporate bacterium, viral or fungal species

Most pharmacological treatments show promise in the treatment of nail conditions and infections however there is a limitation of comorbidities and polypharmacy in the older population. Certain treatment modalities need to be approached with caution. Topical treatments can provide similar effects however certain patients may find it difficult to reach their own toenails in order to apply the agent, thus requiring the aid of a family member, carer or healthcare professional. The results of topical treatment require months of repeated applications (Murdan, 2016)**.** Mycosis is 20% more prevalent in older populations which live with other comorbidities and are at risk of secondary infections (Lee & Lipner, 2022). Onychogryphosis is most prevalent in the elderly population involving the thickening and curvature of the nail. Treatment involves conservative reduction of nail thickness or reduction of mechanical pressure (Ko & Lipner, 2018).

Routine nail care involves a good trimming technique making sure that proper hygiene is kept throughout and to reduce unnecessary mechanical stress from footwear. However, Menz (2016) reported that most older adults find it difficult to comfortably perform nail care due to limited flexibility. Dexterity and visual capacity also play a key role in maintaining nail care and overall foot hygiene, which is why in some cases being discharged from podiatric services may be of detriment to them. Furthermore, as expressed by Miikkola et al., (2019) conditions like onychogryphosis or onychocryptosis are not easily managed by patients themselves with a regular clipper thus necessitating a visit to a podiatry clinic.

2.6.2. Foot Dermatology

One of the most common physical aspects of ageing is changes in the skin and its layers. Within the dermo-epidermal junction, sweat glands become less dense and the turnover rate of keratinocytes is reduced. On the other hand, the dermis elastin and collagen fibres become scarcer resulting in an overall reduction in elastic recoil (Smith, 1989). Changes in the skin are subdivided into intrinsic and extrinsic. Intrinsic factors are non-modifiable like genetics and chronological age. Meanwhile, extrinsic factors are modifiable such as sun exposure and smoking (Wong & Chew, 2021). The above changes predispose the elderly to develop xerosis, fissuring and formation

of hyperkeratosis (Thomas et al., 1985). Subcutaneous fat has been found to reduce in areas of the extremities with an observed increase in the central regions of the body possibly to aid thermoregulation of the vital organs (Farage, Miller, Elsner, & Maibach, 2013)**.**

There was little expansion on what we already know about the dermatological changes that affect the lower extremities of older adults. Decreased activity of sebaceous sweat glands is the leading cause of xerosis along the legs and feet which is extremely common in this demographic (Theodosat, 2004). Skin changes are related to reduced functional capacity in the older adult population. Blume-Peytavi et al., (2016) have described 3 stages of skin care; primary skin protection (from eg. excessive UV exposure), secondary self-examination and dry skin management and tertiary wound management.

One of the leading causes of foot pain and discomfort related to skin is the formation of hyperkeratosis. The formation of hyperkeratosis is often accompanied by pain in pressure areas at the sole and would thus require routine visits to a podiatric clinic for scalpel debridement and offloading (Landorf et al., 2013). Using a durometer in healthy individuals it was found that biomechanical properties of the foot change making the sole hardens with age with the hindfoot in particular having less elasticity than the forefoot. This is a predicting factor in the development of hyperkeratosis (Periyasamy, Anand, & Ammini, 2012).

Skin care at home involves maintaining good hygiene, and inspection for dryness or excessive moisture moisturising. Skin changes tend to be considered normal and thus in some cases be ignored (Brennan-Cook & Turner Rachel, 2019). Management of xerosis is encouraged early on by advising a variety of moisturisers to be used as part of the daily routine. Care must be taken as xerosis is a predisposing factor to other conditions such as pruritus, infections and ulcerations. In some cases, skin pathologies can be prevented by managing underlying or longstanding conditions such as diabetes (Parker, J., Scharfbillig, & Jones, 2017). Much research has been made on the effects of ageing on the skin, however, foot-targeted research in this aspect is still limited

specifically the effect of patient self-care related to the skin in patients who do not live with diabetes.

2.6.3. Biomechanics of the Ageing Foot

Biomechanical changes of the foot have been greatly suspected as reasons for developing foot pain in older adults such as changes in soft tissue, joint mobility, strength and balance. The plantar soft tissue stiffens with age and results in a dissipation of greater energy after compression, leading to pain in weight bearing. These changes result in higher plantar pressure at the regions of heel and metatarsal than those of a younger age giving way to further mechanical stresses, development of pain and disability (Menz, 2012).

Joint physiology is greatly influenced by age. There is a notable reduction in water content from within the cartilage causing stiffness which is further exacerbated by cross-linking of collagen fibres. These changes all contribute to an overall reduced range of motion of joints (Menz, 2015). Studies investigating changes in ranges of motion have found that subtalar joint eversion/inversion and dorsiflexion at the ankle and metatarsophalangeal joint are around 30% less in older adults than in the young (Scott et al., 2007). A meta-analysis was conducted in this regard and from 5 articles identified that older adults exhibited less ankle dorsiflexion during the swing phase of gait. These findings indicate more difficulty in performing normal gait and develop further consequences (Pol et al., 2021).

Impaired joint range of motions greatly impacts the speed and quality of gait as well as impairs the ability of the foot to adapt to irregular terrain adding to the risk of sustaining a fall (Menz, 2015). Muscle mass (both amount and size of muscle fibres) is reduced with age reducing the strength that a person has in motion. It was confirmed that older people exhibit a 40% loss in muscle strength of the foot and ankle when compared with younger adults (Menz, 2015). Loss of

muscle function is also related to the formation of digital deformities such as hammer toes with a weakened plantar flexor motion (Uritani, Fukumoto, Matsumoto, & Shima, 2014).

Older adults generally exhibit lower physical capabilities during motion than the young. A negative correlation was uncovered between age and strength at the levels of the hip, knee, and ankle joints. Functional demand is also negatively correlated with muscle strength at the same joints (Samuel, Rowe, & Nicol, 2013). However, it was found that in those individuals that undergo regular physical activity, reduction in muscle strength was delayed highlighting the importance of exercise in everyday routine. In the same study, the benefits of running have been stated with importance given to correct technique to prevent other types of musculoskeletal injuries (Kim & Park, 2022)**.**

2.6.4. Balance and Flexibility

One of the main concerns of older individuals is the lower quality of physical function attributed to the reduced levels of balance and flexibility. Reduced joint ranges of motion will negatively impact the overall balance and overall functional ability of the feet. Reduction dorsiflexion inversely contributes to increased plantar pressures when walking as found by Giacomozzi et al., (2014).

Advancement of age increases the likelihood of muscle atrophy at the lower limbs even more than the upper limbs amounting to an approximately 40% difference between the older and younger generations (Vandervoort, 2002). This change correlates with overall muscle strength which is further exacerbated with ill-fitting footwear. The total loss of muscle strength impacts the digits as it impairs weight-bearing grasping leading to the development of digital deformities and increased risk of falls (Mickle et al., 2009). The mentioned evidence signifies the importance of physical exercise and therapy when treating foot pain in older adults.

In order to maintain postural balance, older people tend to inadvertently activate antagonist muscle groups of the hip more than younger people. Additionally, postural sway is increased with age to maintain stability. These factors are influenced by the individual's ability to adapt to sensory information of his or her surroundings (Viswanathan & Sudarsky, 2012). By older age, it is found that there is a slower adaptation to such information (such as visual information) which influences the level of coping mechanisms such as the aforementioned sway (Osoba, Rao, Agrawal, & Lalwani, 2019).

2.6.5. Footwear

Footwear plays a vital role in foot health. Different types of footwear can cater to different activities performed ranging from simply walking to sporting activities. However, it is imperative to understand that the choice of footwear worn should be adequate to prevent foot pain and not solely influenced by sociocultural and psychological factors (Barwick et al., 2018). Proper footwear fit is commonly dismissed with many adopting a narrower fit and style, especially in females. Studies have shown that females tend to develop more foot problems related to footwear because of ill-fit (Soames & Evans, 1987). Temporal relationships between ill-fitting footwear and the development of digital deformities are difficult to determine between individuals as the said deformities may be formed while wearing poor footwear at a younger age (Menz et al., 2016).

Ill-fitting footwear has been linked several times as the underlying cause of increased plantar pressures leading to a variety of foot pathologies. Inadequate footwear decreases balance while increasing the risk of falls and injury. The formation of hyperkeratosis is amongst the most common changes attributed to the skin leading to a risk of ulceration if left untreated which is worrisome for the elderly and those living with diabetes. Digital deformities such as hallux valgus and hammertoes are also common and are potentially very uncomfortable in the elderly population. Digital changes are usually attributed to a narrow toe box of the shoe’s anatomy (Ikpeze, Omar, & Elfar, 2015). A longitudinal study conducted in Boston has identified that ill-fitting footwear was one of the main causative factors leading to falls in a home setting. They have found that older adults might wear adequate style footwear outdoors however tend to do the opposite while in their

own homes. Some participants admitted they even walked barefoot. They compared different footwear styles such as loafers, boots, and sandals, and did not identify any increased associations with falls (Kelsey et al., 2010).

A thorough literature search was conducted to identify the prevalence of foot pain and pathology in older adults. Most studies have attributed foot pain to incorrect-sized footwear. 81% have worn narrow footwear indoors. The literature suggested that older people may not be able to acquire appropriate footwear that reflects and accommodates the morphological changes of their feet. Additionally, there are some indications that certain individuals were not completely aware of their own shoe size as shoe size measurement was not taken over a 5-year period (Buldt & Menz, 2018).

Another study has compared purchased footwear styles between two age groups. During the data collection process, they also found that the older group did not measure their shoe size as opposed to the younger group before purchasing. It was found that older people preferred buying slip-on style shoes based on comfort, fit and ease of use. Season. However, this study was conducted during the summer season which might have greatly influenced the choice of footwear at the time of the study (McRitchie, Branthwaite, & Chockalingam, 2018). Body image and emotional status were suspected reasons to wear inadequate shoes, especially in women (Naidoo et al., 2010).

Education should be considered as a type of non-operative management to target patients into a better style of footwear that compliments their foot morphology to alleviate or prevent foot pain and foot pathology (Buldt & Menz, 2018). Since older adults need more accommodation due to changes in their foot morphology, the following recommendations were made regarding footwear properties:

1. Higher-collared shoes for balance support (Lord, Bashford, Howland, & Munroe, 1999),
2. Wide toe box to provide comfort for any digital deformity (Bapirzadeh et al., 2014),
3. Custom-made insoles to alleviate plantar pressure and increase balance (Lord, Bashford, Howland, & Munroe, 1999),

4. Hard or slip-resistant soles (Menz & Morris, 2005) and
5. Style such as sneaker shoes (due to associated lower risk of falls) (Menz & Morris, 2005).

2.6.6 Gait

A person's gait is greatly influenced by age with other contributing factors such as mood, personality and living location. Between the ages of 60 and 70, the prevalence of gait disorders was found to be 10% with an exponential increase with age as 80-year-olds exhibit a 60% chance of gait disorder. Development of gait impairment can be the result of neurological, medical and orthopaedic conditions however in older adults, the causes include proprioceptive function, neuromuscular and metabolic disorders (Pirker & Katzenschlager, 2017). Furthermore, older people in fear of falling adapt to protective measures such as swaying. This mechanism is adapted more during the stance phase commonly at age 70 and above and is useful as a clinical indicator for falls. The greater the sway distance the greater the risk of falls especially with impaired vision (Johansson, Nordström, Gustafson, Westling, & Nordström, 2017).

Osoba et al., (2019) list 12 gait patterns commonly exhibited in old age among them being freezing, frontal, dystonic, antalgic, cerebellar, spastic, dyskinetic, paretic, hypokinetic. They share similar properties and are often linked with comorbidities (e.g. Parkinons are commonly associated with a freezing gait pattern). Gait patterns in the elderly share common characteristics such as a shortening of swing phase, a widened support base, shortened stride length, shuffling and specific postural adjustments**.** These characteristics are even more prevalent and exacerbated in challenging conditions such as speed walking than in regular day-to-day walking (Ferrucci, Ko, & Hausdorff, 2010).

Normal gait speeding decreases by 1% per year by age 80 which is caused by a reduced step length (Pirker & Katzenschlager, 2017). A study conducted within a developing country has stated that a lower gait speed can lead to detrimental effects in older adults such as falls. In some cases, this is an avoidable risk by encouraging physical activity and educating about self-care (Busch et al., 2015). From their analysis of 9 cohort studies Studenski et al., (2011) have praised the reliability

of gate speed as a health predictor for the survival and life expectancy in the older population. Further measures of gait are used by healthcare professionals in assessing a patient's gait symmetry, endurance, adaptability (to different terrain and obstacles), and task performance (asking the individual to perform a given task while walking in order to assess gait with his/her attention divided). The literature suggests that these measures will aid clinicians in finding the best outcomes for each patient following a thorough assessment (Middleton & Fritz, 2013).

2.6.7. Falls

Falls are the leading cause of morbidity in the elderly and hospitalisation with the possibility of fatal risk (Al-Aama, 2011). A fall can be categorised in two different ways; Slipping or Tripping. Tripping is the term used to describe an unexpected foot contact with a surface that generates a momentum that causes destabilisation of the person (Nagano, 2022). The minimum foot clearance is the phase that determines the stability of the person during the swing phase because a small supporting base is reached. In older adults, it is altered mainly due to lower gait speed and joint stability. Slipping is a similar event that is described as the backward or sideways loss of balance due to anterior movement of the foot after contact. This can be dangerous due to the greater risk of injuries such as fractures of the hip (Nagano, 2022).

Ill-fitting footwear is one of the main causes of falls among the elderly. Other consequences include the disturbance of the person's psychological, social and economic status (Al-Aama, 2011). Furthermore, due to advancing age and changes in biomechanics, certain parameters of the gait cycle (such as stride length, gait speed and heel contact velocity) are also altered which play a contributing factor in the incidence of falls (Lockhart, Smith, & Woldstad, 2005). Additionally, due to their tendency to put more effort into maintaining balance and stability during weight-bearing, the risk of falls increases dramatically. Environmental aspects need to be considered such as the home itself. Care needs to be taken as certain obstacles can easily trip an older adult (further exacerbated by the presence of visual impairments) (Spink, Menz, & Lord, 2008). Different studies have found that 30% of the elderly population (aged 60 and above) fall at least once in their life (Alshammari et al., 2018).

In older adults, it is imperative to implement a risk assessment for falls as a preventative measure. much as possible as would otherwise exacerbate their frailty. As stated, exercise has proven to be beneficial to those at risk of falls by improving muscle strength, however, depending on the type of physical activity and location, the risk may actually be increased (Strini, Schiavolin, & Prendin, 2021).

Part of self-care is recognising the need to address these risks. An educational program for fall prevention should encompass proper education on footwear style, insole characteristics, a physical exercise program as well as management of polypharmacy as required. Studies usually show beneficial results regarding self-care programs for falls prevention. However, the efficacy of the treatment modality is highly dependent on the adherence of the patients themselves (Spink, Menz, & Lord, 2008)**.** Kelsey et al., (2010) have argued that the main two causes of falls are both tripping and slipping. One of the preventative measures is advising on safer styles of footwear that have an outsole that makes friction to the ground avoiding slipping (Chang, Leclercq, Lockhart, & Haslam, 2016). Other shoe or insole modifications should promote ankle dorsiflexion in order to support foot clearance (Nagano, 2022). Some older people may find comfort in being within their homes to walk either barefoot or just with socks. This should not be encouraged as walking in such a manner provides little friction with the ground leading to an increased risk of slipping. There has been a diverse array of research done on footwear for preventing falls which consistently shows a correlation between ill-fitting footwear or barefoot walking to increased risk of falls (Kelsey et al., 2010).

2.7. Self-Care

Self-care practice is fundamental for one's health in everyday life and in every aspect of the medical field (Narasimhan et al., 2019). It is defined as self-initiated behaviour the individual takes in order to better his well-being, sometimes being guided by advice from medical professionals (Bonner et al., 2016). Simply seeking a consultation with a physician is also regarded as a part of self-care. Such measures are taken to aid the treatment regimen; however, they are most effective

as preventatives of further deterioration or development of further pathologies (Riegel et al., 2017). Foot self-care is pivotal for high-risk individuals such as people living with type-2 diabetes due to the fact that they are at greater risk of limb loss (Bai et al., 2009). However, self-care shouldn't be considered only as a preventative for mortality but also to prevent pain and disability in any population (Miikola et al., 2019).

An analysis conducted by Martinez et al., (2021) identified a clarified definition of self-care: The ability to care for oneself through awareness, self-control, and self-reliance in order to achieve, maintain, or promote optimal health and well-being. The complexity of self-care, within the context of increasing chronic and communicable diseases, is evidenced by its dynamic ability to transcend multiple disciplines. Current and future definitions of self-care would benefit by being multifaceted and addressing a holistic view of the chronic disease patient within a global health context (Martinez et al., 2021).

The level of knowledge and motivation for self-care is fundamental to determining whether an individual will proceed to perform self-care actions. It encompasses basic concepts such as foot inspection, hygiene, shoe inspection and seeking medical advice when deemed necessary. Different studies have implemented the use of educational programs for the improvement of foot self-care knowledge and practices especially in those living with diabetes with generally positive results. However, since these studies had a specific target population, there is little research about such tactics adopted for a wider population group (Wazqar et al., 2021)**.**

2.7.1. Foot-Care Knowledge

It is the role of each healthcare professional to provide education to their patients about their general health, presenting conditions, prevention and self-care. Self-care knowledge has been studied vastly especially within the high-risk population (Muhammed-Lutfi et al., 2014). Knowledge of self-care is a good predictor of actual self-care motivation but is not always reflected

in self-care practice (Sari et al., 2020). Apart from the clinic, the public can be informed through other means such as media, however, their impact on behaviour is yet to be properly determined.

There is evidence that shows that a key influence in patient knowledge is simply effective communication during the visit to the podiatrist with recommendations indicating the need to reinforce clear and effective. Knowledge can be spread not just through in-person sessions but potentially even through media in order to reach a wider audience (Pourkazemi et al., 2020)**.** However, it is well documented in the literature that knowledge alone is not sufficient to obtain the desired outcomes. Knowledge on its own is only one of the domains that determine competence in self-care. The rest of the domains described were values, experiences and attitudes (Laitinen, Pasanen, Wasenius, & Stolt, 2022).

A systematic review was conducted using several studies dated between 1992 and 2018 which have assessed the level of foot care knowledge in patients especially those living with type II diabetes. The vast majority show a beneficial impact of education from a podiatrist into self-care. Positive results were obtained from a 12-month period where patients were either given one-on-one sessions with treatment by the podiatrist, or via written instructions only (Goodall et al., 2020).

Little research has been done on foot self-care knowledge in the local context. One study however sought to determine the level of self-care knowledge in patients living with higher risk patients, specifically those living with type 2 diabetes (Formosa, C. & Muscat, 2016). Results showed a deficit in foot care knowledge in diabetic care and poor levels of self-care. However, the tool used had targeted questions about the diabetic condition such as symptoms. Thus, when assessing self-care in a broader population, the tool does not need to dive deep into certain specifications.

2.7.2. Foot-Care Behaviour

On its own, knowledge does not improve a persons' health status; it is the motivation, behaviour and practice that truly makes the difference (Sulistyo et al., 2018). Bandura (1986) describes the self-efficacy theory which refers to the beliefs, feelings and motivation the person has on himself and the task at hand. Determination and outcome expectations are the main components the individual needs to obey this theory. Thus, education strategies should focus on teaching confidence to patients that the suggested goals are attainable (Sharoni et al., 2017). Different tools were designed to quantify self-care behaviour in those living with Diabetes which are also applicable to any population. Proper self-care should cover the following aspects: checking footwear, applying emollient for xerotic skin, washing and drying well between toes, proper exercise, proper nail care, general inspection of the feet and consulting a professional when necessary (Miikola et al., 2019).

From the studies that measured the level of knowledge in foot self-care found a positive correlation with the level of foot care behaviour, meaning that patients were more likely to perform self-care practices when receiving the relative education. However, from a systematic review conducted by Goodall et al., (2020) it should be noted that the articles and studies included mainly measured these variables in the diabetic population and could not be applicable to the broad geriatric population due to high-risk bias of living with diabetes. In their study, Miikkola et al., (2019) suggested the use of the Behaviour Change Wheel tool which aids in developing behavioural change strategies to enhance self-care practices in older adults. This method can be adapted in different ways depending on the priority of the case. This framework is composed of 3 non-linear categories; sources of behaviour, intervention functions and policy categories whose components are then linked together (Michie, van Stralen, & West, 2011). There was no research done using this model with regard to foot-related self-care.

2.7.3. Self-Care Motivation

It is not enough to possess the knowledge, in order for knowledge to be translated into action one requires a level of motivation. According to the self-efficacy theory, an individual is more willing to participate in self-care activities when he/she is confident in his or her success. This theory recommends that healthcare professionals be encouraged during the consultation in order to boost motivation and positive outcomes (Goodall et al., 2020). With age it was discussed that behavioural motivation decreases. This may be attributed to their recognition of their cognitive and functional decline leading to older adults being more selective where they put their efforts into. This statement incentivises any health practitioner to put healthy self-care practices as a goal for the older adult so their interest can be translated into decision-making and effort for improving self-care (Strough, de Bruin, & Peters, 2015).

Literature on motivation discusses that in order for older adults to increase or maintain motivation, certain requirements are needed. These include a working memory, attention, initiative and lack of prepotent responses. Solidifying these into everyday life improves self-efficacy and in the medical context, increases adherence to professional advice (National Research Council, Division of Behavioural and Social Sciences and Education, Sensory Sciences Board on Behavioural Cognitive, & Adult Developmental Psychology Committee on Aging Frontiers in Social Psychology, Personality, 2006).

A systematic review was conducted to identify the association between self-efficacy and self-care. A positive association was found between them in the context of hypertension. This review was not done with the ageing population in mind however it proposed ways by which to maintain self-efficacy by the healthcare system such as motivation-related interviews to work on certain feedback and provision of health coach to provide encouragement towards better self-care behaviour (Tan, Oka, Dambha-Miller, & Tan, 2021). Self-Care for Older Persons or SCOPE is an intervention program that was created with the intention of health promotion and disease-oriented prevention and management while removing the stigmatisation of older adults in their everyday lives (Chan et al., 2015). The study conducted by Kheng Siang et al., (2020) has shown promise in using this program with community-dwelling older adults when living with certain conditions

such as hypertension and diabetes to assess self-efficacy. More studies are needed on the validity of this tool in community-based self-care programs with other medical indications.

2.7.4. Foot Care Advice and Education

In any clinical practice, patients are advised on how to take proper care of themselves. Some advice can be specific depending on the speciality but various points of self-care are linked together. In podiatric practice, people are advised on general health care such as avoiding smoking but specifically, they are reminded of factors such as good hygiene (even between toes), proper footwear, safe nail-cutting technique, avoiding exposure to extreme temperatures and daily inspection (James et al., 2021).

This study conducted in 2012 at a local primary care setting suggested that individuals (that live with type II diabetes) did not always receive proper and consistent foot care education. It was recommended that a biopsychosocial model needs to be adopted to maximise positive outcomes of education provided by healthcare professionals. Since foot care advice given to older adults and those living with diabetes are very similar, the findings can be considered as reflective for both population groups (Formosa, Gatt, & Chockalingam, 2012). Educational programs and sessions with both patients and caregivers are an option to further implement self-care practices in daily routine. These programs include the implementation of workshops together with healthcare professionals for the scope of making sure that self-care practices can be done to the most optimal level (Ahmad Sharoni, Minhat, Mohd Zulkefli, & Baharom, 2016). A study assessed the effectiveness of such sessions on the importance and approaches to foot health and self-care by specifically showing the benefits via a face-to-face setting for all parties involved. Although promising results with improved awareness and self-care capabilities, the sample size (of 9) was not substantial enough, necessitating further testing (Green-Morris, 2019).

Due to the concept that patients living with certain long-term comorbidities such as diabetes are of higher risk, emphasis and education on foot self-care is greater than for the general population including older adults (who would otherwise not have such condition). This fact there is also

limited research on the effectiveness of standardised educational programs and modalities for the general population (Matricciani & Jones, 2015).

2.8. Access to Healthcare

One of the primary components of self-care is being able to recognise when to seek help from a professional (Martinez et al., 2021). For the purpose of older people, having access to healthcare is essential for their health. In a literature review, it was concluded that the most common contributing factors to accessibility include geographical locations of both healthcare service buildings and residences, access to transport and level of morbidity. Understanding how these affect the individual paired with the overall outreach of healthcare services will greatly improve the ability of a person to reach the services he/she requires (Van Gaans & Dent, 2018). Access to healthcare has been greatly hindered especially during the COVID-19 pandemic as people stayed more in isolation/lockdown and were more hesitant to leave their homes. This aspect of the pandemic life was harder on those living with certain health risks common in those of older age. Another limiting factor is the lack of technological skills hindering their ability to communicate effectively with outside support services (Bastani et al., 2021).

Telemedicine has been proposed for those who find it difficult to access certain services as it is economically friendly, can be at home and can be used for various medical conditions. With the use of technology such as smartphones or tablets, healthcare professionals and patients are able to contact each other to discuss health management. By doing so, self-care education is easily given with guidance on when it would be absolutely necessary to seek clinical or hospital appointments (Kavitha, Deshpande, Pandit, & Unnikrishnan, 2020). Telemedicine was devised to aid vulnerable people in accessing healthcare services. However, its success depends on the technological literacy of the person. A meta-analysis conducted to observe the effectiveness of telemedicine has shown promise when catering to the diabetic foot. Most studies from this analysis have praised the method's effectiveness with only a few stating an increase in patient mortality (Tchero et al., 2017). A study has been conducted in a local setting that assessed the benefits of podiatric telemedicine for both the patient and the podiatric service. It was highlighted that telemedicine had the potential to save time while reducing the waiting list for podiatry appointments. However, it was further

commented that telemedicine diminishes the patient-practitioner relationship while management is based solely on patients' self-reports which might not be factually accurate (Lisa Ann Mercieca, 2021)

2.9. The Role of the Podiatrist with Older Adults

Older adults experience a wide variety of foot problems due to changes related to ageing such as morphological changes which if ignored could lead to deformity, disability and complications of diseases. Apart from advancing age, other risk factors for foot problems include gender, physical activity (both few or plenty), obesity, footwear and even genetics (Muchna et al., 2018). In this population, medical problems impact lifestyles as they may impair bone mass, muscle strength and the ability to perform activities of daily living (Helfand, 2011).

Podiatry assessment for older adults has been recognized as fundamental and was discussed in the White House Conference on Ageing back in 1981 stating that: "comprehensive foot care be provided for the elderly in a manner equal to the care provided for other parts of the human body, to permit patients to remain ambulatory" (James, Orkaby, & Schwartz, 2021). Foot risk assessment provides benefits in reducing incidents of falls which could be detrimental to patient health. This should be incorporated within every consultation visit at the podiatry clinic with other diagnostic tools used where necessary and self-care advice given at all times (Iseli, Duncan, Lee, Lewis, & Maier, 2021).

Even though there has been extensive research on foot conditions and specific patient groups, there has been little research done on the experiences of older adults when it comes to taking care of their own feet (Miikkola et al., 2019). Mattricciani and Jones (2015) have stated that differences in foot care practices are partially because the podiatrist deems the patient at a certain level of risk. High-risk patients are given extensive education and guidance on proper foot-related self-care and management, while those of low risk are less likely to receive the same amount of emphasis. It is the role of the podiatrist to be able to promote self-care practices to all patients in order for them to be more self-reliant as much as possible.

2.10. Podiatry in Malta

Podiatry in the Maltese islands is an ever-growing profession that encompasses assessment, diagnosis, treatment and prevention of foot conditions and pathologies. Prevention and treatment are often achieved through education and form a big part of the profession through practitioner and patient contact (The Association of Podiatrists of Malta, 2021).

The service can be found easily by everyone within both the government and private sector. For those individuals actively living in the community, the service can be accessed through the Primary HealthCare within Health Centres. The mission statement of the Primary HealthCare is to provide the highest quality of integrated primary health while continuing to explore further ways to reach the service to more people in the community (Government of Malta, 2020). Podiatry is one of many health services offered within Primary health and it encompasses the following: Core Podiatry (routine assessment and treatment of dermatological, biomechanical, vascular, neurological and nail pathologies), Gait Analysis, Screening, Podopaediatrics, Rheumatoid, Diabetes, Nail Surgery, Wound Management and Podo Geriatrics (Government of Malta, 2020).

Podiatrists are key members of the vascular team which reviews outpatients and inpatients with vascular insufficiency or at risk due to diabetes. Advice is given to best combat and prevent any deterioration due to the condition (Dimech, Galea, Cassar, & Grima, 2021). Podiatrists in Malta can utilise anything within their own expertise to diagnose, treat and manage foot conditions. They are authorised to provide advice for patients as a preventative measure for the formation or deterioration of foot conditions (Muscat, Cali Corleo, & Attard Previ, 2016).

Various studies have been conducted in the local setting to help improve the service provided to the older adult population and to better understand certain attributes of foot health. However, there have been limited studies on the impact of the profession on patient self-care in Malta. A local study was conducted to assess patient knowledge and foot-related self-care however this study specifically targeted the diabetic population (Formosa, C. & Muscat, 2016). A similar approach is still missing to determine the effect of podiatric intervention in the broader older adult population.

2.11. Foot-related Quality of Life

Directly influencing the quality of life, activities of daily living are the routine and essential skill that an individual has in order to perform tasks independently which are reflective of his/her functional status (Bieńkiewicz, Brandi, Goldenberg, Hughes, & Hermsdörfer, 2014). The inability to perform such tasks leads to life in restricting and possibly unsafe environments (Edemekong, Bomgaars, Sukumaran, & Schoo, 2022). Individual factors such as cognition, motor skills and perceptual abilities all affect the ability to successfully perform these tasks (Mlinac & Feng, 2016). Different tools are adapted to measure and quantify these tasks which revolve commonly around transferring, mobility, dressing, use of stairs and more with the objective of determining the level of independence in the elderly (Pashmdarfard & Azad, 2020). Furthermore, foot-related Quality of life has also been greatly assessed with different tools being constructed for the task. One such tool is the Foot Health Status Questionnaire (FHSQ) which is one of the most commonly used in research studies. One of these studies sought to use the FHSQ to assess the quality of life in those who live with lesser toe deformities. Using this tool, participants with lesser toe deformities scored a lower quality of life score compared to a control group (Lopez Lopez et al., 2018)**.** This cements the idea that older age negatively impacts the quality of life with certain foot conditions providing a worsening effect (López et al., 2016).

In geriatric studies, quality of life has been explored greatly in different aspects of their lives. A study conducted in 2004 by Gabriel and Bowling has produced both quantitative and qualitative data with the following descriptions emerging as common themes: 1) good social relationships, 2) accessibility to help and support, 3) safety, 4) engaging in hobbies 5) positive mental health and engagement in society and more. Quality of life is subjective to the individual, as perceptions, expectations and interpretations vary greatly. Thus, modifications need to cater to the person's needs while keeping in mind the social environment (Carr, Gibson, & Robinson, 2001). As previously stated, perceptions of ageing and mental health influence different domains of older adult life such as social skills and physical health. This fact has been further solidified by Ingrand et al., (2018) who studied the relationship between psychological factors with the overall QOL of older adults. Psychological distress, perceived health, family support, financial status, coping

skills, level of self-esteem and perception of ageing were taken into account. It was concluded that positive outlooks on ageing are predictors of good quality of life levels possibly due to more liberty and confidence in functional ability.

2.12. Conclusion

This literature search sought to identify studies of interest that involve the impact of the ageing process on older adults and specifically their foot health while also appraising research done on physical, social and mental changes undergone by senescence. From the known knowledge, there is a lack of studies performed on proper foot-related self-care in the general older adult population living in the community. Furthermore, there is lacking knowledge on the impact of podiatric intervention and education within the same population in the local setting. Such studies have been performed within specific patient groups that live with certain conditions such as diabetes and rheumatoid arthritis. Hence this study sought to explore the impact of podiatric intervention within the general older adult population as attendance to the podiatry clinic is not restricted only to those with certain health conditions but open also to those relatively healthy. The following chapter will delineate in detail the methodological approach and methods used to explore and answer the research question; including the sampling method and the tools while introducing the statistical tests used.

CHAPTER 3
METHODOLOGY

3.1 Research Framework and Model

A research or theoretical framework is defined as the structure that supports the theory adopted for a particular research. This framework guides the researcher to better understand the phenomena of a given subject. Bethel, Reed, Brewer, & Rainbow (2022) categorises 4 models as theoretical frameworks, those being: 1) Donabedian's quality model, 2) the Quality Health Outcomes Model, 3) the Systems research organising model and 4) Systems Engineering Initiative for Patient Safety 2.0. The term 'theoretical framework' is often used interchangeably with conceptual framework. (Varpio, Paradis, Uijtdehaage, & Young, 2020) define the conceptual framework as the reasoning and importance as to why the study needs to be conducted, by providing the known knowledge from a thorough literature review, identifying any gaps and identifying the methodological approaches.

To construct a theoretical framework, the researcher needs to identify which theory and concept which serve as the backbone of the study, using logic to relate to the chosen subject of study that is being carried out (Lederman & Lederman, 2015). If constructed correctly, the framework functions to aid derive the research question and what methodological approach is most appropriate to best answer the question (Parker, G. et al., 2022).

There are 2 main research models or research approaches adopted for logical reasoning; deductive and inductive. The inductive model derives theories after observations are made at the end of the research process. It makes use of predictions based on known knowledge to reach a new theory (Hayes & Heit, 2018)**.** In this study, a deductive approach was adopted. This model uses already established theories in order to solve issues of the research questions or come to conclusions based also on found knowledge (Bonner et al., 2021). It has been argued that a deductive approach may be used in cases where there are present relationships or associations between the components (or variables) of the study (Shin, 2019).

3.1.1. Research Approach

Research methodology in medicine can take 3 different forms being either quantitative, qualitative, or mixed methods in nature. Each of these methodologies has strengths and limitations depending on the type of research being performed (Abdull Wahab, Ismail, & Othman, 2018). Qualitative research gives a more in-depth description of the experiences of the individual or a group whilst quantitative studies aim to give a numerical representation of data that can be statistically analysed by computer software and can be generalised (Bayot et al., 2021). The mixed-method approach comprises both qualitative and quantitative elements and can provide further depth into research by considering certain elements such as cultural and environmental factors (Vedel et al., 2019). As stated by Wright et al. (2016), quantitative research entails the testing of a particular theory-driven for the purpose of a particular topic or study. Theories and hypotheses are constructed to find a statistical association between certain variables and use logic in order to create data. It should be noted that quantitative studies favour larger sample sizes to get a greater statistical representation of the population.

Quantitative research can be subdivided into experimental, non-experimental and quasi-experimental (Bayot et al., 2021). In experimental studies, the researcher would perform an intervention or manipulate one or more variables to observe the outcome (Nedel & Silveira, 2016). On the other hand, in non-experimental or observational studies the researcher performs no intervention on the participants but just observes the relationship between factors (Thiese, 2014).

Rezigalla (2020) describes observational studies as being subdivided into being either analytical or descriptive in nature. Descriptive research can take the form of correlation, cross-sectional, or case studies. Meanwhile, analytical research includes cohort, cross-sectional and case-control studies.

Longitudinal studies, also referred to as prospective studies, are defined as observations of the same participants made across a prolonged period of time (1 year or more) (Caruana et al., 2015). Such studies may include a) cohort panels by which some or all participants of a given population are considered over a period of time and b) representative panels by which data is taken regularly from random samples. Longitudinal studies are dependent on participants' incentive to continue their role in participating. Thus, it is imperative that researchers form a positive relationship with participants to avoid discouragement on their behalf (Wang et al., 2016).

In this study, no intervention was required by the researcher, but merely observation of differences in foot self-care between routine visits when exposed to foot-related self-care education provided at podiatry clinics. Participants still received their regular treatment as deemed necessary by the attending podiatrist and no additional care was given for the purpose of this study. An observational and longitudinal research design was adopted as follow-up appointments were done to re-evaluate the level of foot self-care practices.

3.1.2. Philosophical Paradigms

A set of beliefs and understandings shared by other researchers that relate to problem understanding and solution is known as a philosophical paradigm (Kuhn, 1962). As described by Bunniss & Kelly (2010) there are 4 main paradigms adopted in medical research; 1) Positivism, 2) Post-Positivism, 3) Interpretivism and 4) Critical Theory.

Traditionally positivism and post-positivism are most commonly used. Positivism takes into account the absolute truth and certainty of a given topic. Research in a positivist paradigm will also make predictions on the outcome by referencing the scientific knowledge available (Park, Konge, & Artino, 2020). On the other hand, post-positivism acknowledges the interference of human limitations and errors. This infers that the findings of the study may be reflective of a population or relative context but not the absolute truth (Tanlaka, Ewashen, & King-Shier, 2019). Having taken into account the definitions and functions of these paradigms, a post-positivism paradigm was deemed more relevant for the purpose of this study.

3.1.3. Research Design

A multi-centre, non-experimental prospective design was conducted amongst 120 individuals aged 65 years and above and who made use of Podiatry Clinics within the local Health Centres at the Primary Health sector. The three chosen Health Centres for this study were those from Northern, Southern and Central regions of Malta respectively in order to obtain a better representation of responses between the different geographical regions of Malta according to their catchment area.

3.2 Recruitment of Participants

Participants were recruited through convenience sampling from respective health centres during their scheduled appointment at the podiatry clinics. An intermediary was asked to identify any patients who meet the inclusion criteria (Section 3.2.7.). The intermediary achieved this by relaying and working hand in hand with other podiatrists working within the different clinics used. Once identified, the intermediary approached the prospective participants and invited them to participate in the study. At the same time, participants were provided with an information sheet summarising what the study entails and what was expected of them (Appendix 3 and 4). During the recruitment period of this study, there were no specific strategies or tools used to identify individuals with cognitive impairments but the decision was left up to the discretion of the intermediary and podiatrist. Individuals who had shown signs of being unable to understand certain simple language, unable to read or write were excluded.

When the invitation was accepted, they were asked to sign a consent form (Appendix 1 and 2). Once signed, the intermediary informed the participants on how to contact the researcher to schedule the first appointment. The date first appointment for the study was chosen to coincide with their next appointment at the podiatric clinic for convenience purposes. Both the information sheet and consent form explained to participants that they may forfeit the study at any point without any repercussions on the service they are entitled to.

3.2.1 Sampling

3.2.2 Target Population

This study sought to assess foot self-care practices in the older adult population (above 65 years of age). Individuals who were able to provide consent and have the necessary cognitive ability to answer the questionnaires were included in this study. People were recruited regardless of their current comorbidities to obtain a better reflection on the whole older adult population as a whole.

3.2.3. Sample Size and Power Calculation

An optimal sample size needs to be determined prior to data collection so as to enhance what is referred to as power in the results obtained (Suresh & Chandrashekara, 2012). The statistical power of a study can be defined as the ability to reject more accurately a null hypothesis that is deemed indeed false (Akobeng, 2016). Statistical power is influenced by the predetermined level of significance, the sample size, and the effect size or the extent to which the groups differ based on treatment. Thus, the higher the sample size the greater the statistical power (Dorey, 2011).

The Maltese adult population was shown to stand around 516,100 by the year 2022 (NSO, 2022). In the case of this study, the Maltese older adult population (above 65 years) is approximately 92,100 individuals so the margin of error for this study can be calculated. (Hazra, 2017) has stated that a 95% confidence level (z=1.96) is an optimal guideline to use in quantitative studies such as this. In fact, a sample of 120 participants selected from a population of 92,100 Maltese older adults aged 65 years and above, guaranteed a maximum margin of error of 6.72% assuming a 95% degree of confidence. The calculation is shown below as follows:

$$\text{Margin of error} = z \times \frac{\sigma}{\sqrt{n}}$$

For a 95% confidence level, z = 1.96 is the standard error (Standard deviation of the sampling distribution of proportion), which is given by:

$$\sigma_p = \sqrt{\frac{p(1-p)}{n}\left(\frac{N-n}{N-1}\right)}$$

When the sample size is n= 120 and the population size (N) is 92100, the maximum value of the standard error σ_p is 0.0456. The margin of error can now be calculated by the formula:

$$\text{Maximum margin of error} = z\sigma_p = (1.96)(0.0456) = 0.0894 = 8.94\%$$

The obtained value satisfies and coincides with the range stipulated by (Suresh & Chandrashekara, 2012) of 5% - 10% in quantitative research. The sample size for this study of 109 participants is considered representative of the older adult population of 92,100. This means that any data obtained from this sample will be deemed reliable. A greater sample size will yield more reliable data, however, there is a threshold where the increase in accuracy will be negligible and would not be worth the investment of time and other resources (Andrade, 2020).

3.2.4. Sampling Method

In medical research, it is common to involve human participants who have certain conditions or diseases. In order to attain a greater level of internal and external validity of the methodological approach, an appropriate sampling method is required (Suresh et al., 2011). Sampling methods are subdivided into two categories; Probability and Non-Probability Sampling. Probability sampling is described in cases where each eligible person in the population has an equal chance of being selected for the sample and thus is more representative of the target population. On the other hand, non-probability sampling makes use of non-systematic ways that do not guarantee an equal chance of selection into the sample (Setia, 2016). Probability sampling can be further subdivided into 1) Simple random, 2) Stratified Random, 3) Systematic Random and 4) Cluster Sampling. Non-probability as well can be subdivided into: 1) Convenience, 2) Judgemental and 3) Snowball Sampling (Elfil & Negida, 2017).

Snowball sampling is not consistently defined in the literature however it is used mainly in qualitative research. This sampling method is performed by letting the subject himself/herself provide information about another prospective participant. This prospective participant would then provide information on yet another individual and so on hence why it is termed snowball (Kirchherr & Charles, 2018). Judgemental sampling also referred to as purposive sampling is yet another commonly used method in qualitative research. This method can be considered as straying away from random as it targets specific individuals that fit the specific aims and objectives of a particular study (Palinkas et al., 2015).

For the purpose of this study, convenience sampling was deemed ideal. This is because people are selected by ease of accessibility, time availability and geographical proximity (Etikan et al., 2016). Additional attributes of this method are inexpensive, quick and convenient (for both participant and researcher). As mentioned previously, it is often critiqued that convenient sampling does not offer an accurate representation of the population. Andrade (2021) has stated that results from convenient sampling may be generalised only to the population from which the sample is taken from. In the case of this study, it means that results obtained would be representative only of older adults attending podiatry clinics in the government sector and not those that attend podiatry clinics within the private sector or do not make use of podiatry service at all. One of the main assumptions of convenience sampling is that the target population is homogenous, meaning that there will be no particular difference in results if obtained through another sampling method (Etikan, 2016).

In this study, one hundred and twenty participants were chosen via convenience sampling when attending podiatry clinics. Participants were chosen equally from clinics situated in the north, centre and south regions of Malta. These three clinics were used in order to obtain data that would reflect the 3 main geographical regions of Malta for a more representative sample.

3.2.5. Ethical Considerations

To ensure that the World Medical Association Standards were met, the study was submitted to the Board of Ethics (Malta). The study protocol, informed consent, information letter and data collection form were approved by the Faculty of Health Sciences Ethics Board and the University of Malta Ethics Board in May 2022.

Permission for use of the questionnaires was not necessary as they are available through the public domain. However, a correspondence via e-mail with the corresponding team of authors of the tools was made in order to ensure and confirm that no special permissions were required. For The Nottingham Assessment of Functional Footcare, it was confirmed that no permission was necessary. Similarly, permission has been verified as unnecessary for the utilisation of the Foot Health Status Questionnaire (Appendix 8 and 9).

To conduct the study within the Primary Health Care setting, permissions were also sought from the Data Protection Officer of the Primary Health Care and the Head of Podiatry Services at the Department of Health. Further permission was sought from the Professional Lead and Head of the Podiatry Department in order to conduct the study within Podiatry clinics. In accordance with the method final permission was required from a podiatrist to act as an intermediary to this study in order to identify prospective participants and invite them to take part in the study (Appendix 12).

Like many medical studies, the Declaration of Helsinki was consulted and abided by. This document was constructed by the World Medical Association which binds clinicians and researchers to the preservation of the ethical rights of human subjects (World Medical Association, 2013). Currently, there are 7 revisions of this document with the purpose of adding further guidance rather than changing ethical principles. It serves to aid researchers in how to manage vulnerable individuals such as the elderly, children and those living with certain medical conditions (which has been added recently from the 6th revision) (Shrestha & Dunn, 2020).

Some of the general points of the document include:

1) Preservation of health, safety and rights of the patient
2) Safeguarding the environment
3) Preservation of privacy and confidentiality of personal information
4) Emphasising the need to obtain consent while providing all information involving the participant and what the study involves (Shrestha & Dunn, 2020).

3.2.6. Informed Consent

The document signed is legally binding and proves willingness and compliance on behalf of the person recruited (Kadam, 2017). To make a properly informed decision, prospective participants need to be properly informed about what the study entails and their role clearly defined.

Autonomy should be promoted by these documents, giving the right for the person to refuse participation if preferred (Pietrzykowski & Smilowska, 2021). In their study, Thaker et al. (2015) found out that the main reasons for refusal to participate stem from a lack of trust and their perception of risk development. Thus prior to obtaining consent, it should be clearly stated any risks that could be encountered throughout the study and what measures are set in place in order to avoid or deal with said risks.

In this study, the intermediary approached prospective participants and provided them with both an information sheet and a consent form to sign. In both documents, a clear and simple description was provided about the aims and objectives of the study and details of the study procedure. It was made clear to patients that no foreseeable risks were present if they chose to participate in the study. Furthermore, it was ensured that no repercussions would happen on the service that they were normally entitled to if they chose to refuse to take part in the study.

3.2.7. Inclusion/Exclusion Criteria

It is standard practice for every research to have certain criteria in place when recruiting participants prior to data collection. They are commonly characterised by demographic, geographical and clinical factors (Patino & Ferriera, 2018). These criteria identify the target population in an objective and reliable fashion (Garg, 2016). Attention needs to be taken as certain characteristics may interfere with the data collection process and result in unfavourable outcomes of the study. These are referred to as exclusion criteria. A narrow range eligibility criterion can limit variations within the study via a more homogenous subject sample and while also maximising the probability of detecting influences of variables at play (FSA U.S. Food & Drug Administration, 2018).

In this study, individuals who satisfy the following criteria were included:

- Age 65 and above.
- Males and Females
- Make use of podiatry service at primary health care
- Live independently in the community (not in nursing or long-term facilities)

Conversely, individuals who had the following were excluded from this study:

- Patients that show signs of cognitive impairment
- Living in nursing homes or long-term facilities

3.3. Method

A prospective non-experimental longitudinal design was used for the purpose of this study. The first 120 individuals who satisfied the above inclusion criteria were asked to participate in the study and data collection. The intermediary, a podiatrist by profession approached eligible candidates who attended the podiatry clinics at either Paola, Birkirkara, or Mosta health centres. Once approached, the prospective participants were given the information sheet and consent form

to sign. Afterward, they contact the researcher via telephone call (phone number present in the sheets provided) in order to book the first appointment. The first appointment was scheduled at their convenience at the podiatry clinic.

3.3.1. Data Collection Tools

Two data collection tools were used in this study; the Foot Health Status Questionnaire (Carequest, 2019) and the Nottingham Assessment for Functional Foot Care (Lincoln, Jeffcoate, Ince, Smith, & Radford, 2007). Additionally, a Data Collection Sheet was devised to gather demographic information regarding each participant.

3.3.1.1. Data Collection Sheet

This sheet was constructed to gather demographic data about the participant such as gender and age. The index number listed is the code given to the participant to aid in maintaining pseudonymity. More details on the coding method used in this study are included in the following sections. Other components of the data collection include the inclusion of level of education, current medication, smoking history and podiatric intervention.

The inclusion of gender was deemed relevant as it may impact the level of self-care. Gender impact on self-management has been researched before with varying results. (Mei, Tian, Chai, & Fan, 2019) had found that women tend to perform better in taking care of their overall health than men. On the other hand, Heo et al., (2008) have found little difference in self-care behaviours between both males and females of the same target population. Due to its inconsistency and possible effect, gender was included in this study.

Age was included as it affects different aspects of the decision-making skills of an individual which extends to self-care. It was found that advancing age had a negative impact on certain self-care behaviours (Okpalauwaekwe, Li, & Tzeng, 2022). Some studies have highlighted the possibility of cultural impact on aged individuals with regard to lack of health literacy and self-care, especially those aged above 75 (Mahdizadeh & Solhi, 2018). In this study, participants were divided into 3 age groups; 65-74, 75-84, and 85<.

Level of education was included since it could possibly affect a person's understanding of the importance of foot health and the self-care advice given by the podiatrist which would otherwise impact the levels of self-care practices. Furthermore, the level of education is associated with health literacy thus impacting the level of compliance with self-care measures given by medical staff (González et al., 2014).

Current medication was taken into account as it is core in history taking in podiatric practice. Furthermore, having any long-standing comorbidity would imply that the participant would have received a sort of education and self-care advice from a clinician. Depending on the nature of comorbidity, self-care education could have also to foot care. Smoking History was included for a similar reason as well as due to the known impact on general health including the vascular system and foot health.

Finally, the nature of podiatric intervention was taken into account since this poses an influence on the specific foot care education given during the podiatric consultation. The nature of the initial complaint and intervention could provide bias to both patient and clinician as to what advice is given during the consultation and subsequently followed (possibly overshadowing other aspects of foot self-care). At each follow-up visit, all questions were asked again in order to identify any changes in medication, smoking history and podiatric intervention that could influence the final results of the study.

3.3.1.2. Foot Health Status Questionnaire (FHSQ)

The FSHQ was used to measure the status of foot health status and related quality of life (Carequest, 2019). It was developed by CareQuest – Researching Healthcare Solutions and has been used in various studies and translated into many different languages. It has applications to measure outcomes of interventions or treatments before and after administration. It also applies to measuring quality of life in various cases of foot-related conditions (Cuesta-Vargas et al., 2012). Studies related to diabetes have also utilised this tool, such as identifying differences in foot health and quality of life between those living with type I diabetes and those with type II diabetes (Palomo-López et al., 2018).

The tool consists of 4 domains covering Pain (4 items), Function (4 items), Footwear (3 items) and General foot Health (2 items). The FHSQ has been praised for the inclusion of general health which other tools do not have. Each domain has a set of questions in a Likert-type format in which respondents are asked to circle the most appropriate response (Coheña-Jiménez et al., 2020). The questions and responses are written using low-grade English so they can be understood by the layman. The questions that cover both the Pain and General Health domains also ask about the impact of the participant's health status on social health. The final section of the questionnaire asks about gender and medical history which in the case of this study is already covered by the Data Collection Sheet.

There are different tools that could be used for similar purposes such as the Foot Function Index, Bristol Foot Score and the Manchester Foot Pain and Disability Index (Palomo-López et al., 2019). However, the FSHQ was preferred for this study due to its validity and the inclusion of a general health measure (Landorf & Keenan, 2002). The FHSQ exhibited the highest level of responsiveness when compared to other tools such as the Manchester Foot Pain and Disability Index. Furthermore, it has satisfactory retest reliability making it useful in several clinical trials (Menz et al., 2014).

Several translated versions and adaptations of this questionnaire have been made such as a Spanish version which was proven to have a high validity and retest reliability (Cuesta-Vargas et al., 2013). Similarly, a Brazilian version has been constructed and has reported comparable inter- and intra-observer reliability with the original Australian version which is highly acceptable by patients and easy to use. Through a dual-panel process, a Danish version was constructed with a subsequent construct validity test. Although (Riel, Jensen, Olesen, & Rathleff, 2019) praised the tool for its comprehensibility and ease of use, they commented that the psychometric properties of the tool could be expanded more in future studies. On the other hand, Ferreira et al. (2008) stated that overall comments indicate that psychometric properties have been reported to be satisfactory for cross-cultural or cross-ethnic studies (Palomo-López et al., 2019).

The first domain of the questionnaire about Pain has been praised for the favourable construct, criterion and content validity (Cronbach $\alpha = 0.89–0.95$) with high intraclass retest reliability scores (ICC = 0.74–0.92) (Cuesta-Vargas, Bennett, Jimenez-Cebrian, & Labajos-Manzanares, 2013). The domains of general health, physical and social function have also yielded positive levels of validity as tested by (Landorf, Radford, & Hudson, 2010) in their study of Minimal Important Difference.

After completion of the questionnaire, a computer software was used, constructed by the same authors in order to document the scores for each domain from 0 to 100, 0 representing the lowest quality of life while 100 representing good quality of life. Graphical representations of the results are also generated by the software (López-López et al., 2018).

3.3.1.3. Nottingham Assessment for Functional Foot Care (NAFF)

The NAFF (Senussi, Lincoln, & Jeffcoate, 2011) is used to measure foot self-care practices in a given population and thus identify individuals who would not follow or comply with recommended practices (Rakesh et al., 2013). A study conducted found that NAFF was sensitive to educational

interventions making it useful for routine clinical practice (Lincoln et al., 2008) (Appendix 6 and 7).

This tool is composed of 29 items using Likert-style questions that cover self-care activities regarding foot health. Each response has a given score which is added together to give a numerical representation of the individuals' self-care behaviour. It is divided into four components, consisting of elements such as foot inspection, footwear, foot care and nail care (Lincoln et al., 2008). As seen in Appendix 6 or 7, the portion regarding foot inspection also includes hygienic practices such as washing, drying and applying emollient for both feet and digits. Items about footwear ask about both the style and fit along with the type of socks used on a regular basis. Finally, the remaining items involve certain self-care measures or remedies used (Lincoln, Radford, Game, & Jeffcoate, 2008).

NAFF was found to have adequate internal consistency and was able to identify inconsistencies between responses and recommendations by healthcare providers thus necessitating further educational intervention (Senussi et al., 2013). Satisfactory levels of tool test-retest reliability and validity of the tool have also been reported proving it as an adequate tool in research and clinical practice thus making it also suitable for this study (Lincoln et al., 2007). The simplicity of the questions themselves makes the tool easy to administer to people and has shown improvements in foot care awareness within a given population.

NAFF has been commonly used in diabetic foot research including a local study that has evaluated self-care behaviours in those living with type II diabetes in Malta (Bartolo et al., 2013). The study has shown sub-optimal levels of self-care practices which coincides with similar studies performed. Similarly, studies have discovered a positive correlation between the implementation of educational measures and the level of self-care knowledge and behaviours, thus emphasising the importance of patient education (Brand et al., 2016).

3.3.2. Translation of tools

In studies that involve people of different cultures, a standard is made so that all involved can understand and better contribute to a study. For this reason, any applicable tools require accurate translation into the necessary languages (Squires et al., 2013). In this study, the only required languages were the natively spoken Maltese and English.

Prior to using the questionnaires, a Maltese-translated version was created in order to appeal to non-English speakers and readers. Translation of both tools was accomplished using the back translation method (Brislin, 1970). This popular method has been created to aid in cross-cultural research to maintain the validity and relevance of the original tool. The model constructed by Richard Brislin (1970) states that the tools need to have the following qualities: 1) not complex in nature 2) preferential use of repetitive nouns instead of pronouns 3) lack of colloquialisms or metaphors 4) lack of the Passive tense and 5) absence of subjunctive mood and hypothetical phrasing. For back translation to take place, two individuals who are proficient in both the source and target language need to be recruited. One will need to translate the original material into the target language. Following this, the second translator will blindly translate the tool from the target language back to the original (Tyupa & Wild, 2015). At this stage, there will be two copies of the tool in the original language (Klotz, Swider, & Kwon, 2022). The investigator would then need to compare both and if they prove to be identical, it infers that the target language version is valid and equivalent (Brislin, 1970). If by chance the back-translated version did not match the original, the process would have been repeated by asking another translator to do the task or arranging the differences accordingly (Klotz et al., 2022).

Some researchers have found limitations with this method; it is unclear how many individual translators are required in order to reach an acceptable equivalence between the translated and original. Depending on the target language, it can prove difficult to find available qualified individuals who are competent in both languages desired (Cha et al., 2007). Another critique was

discussed by Ozolins et al. (2020) in which the investigators do not take involvement in the translation process. Additionally, some translators will not take into account the cultural differences between the languages by which sentence structures can be altered while still keeping a reliable level of equivalence (Baker, 2011). As a result, translated versions may at times be inconsistent with each other and may cause different cut-off points depending on the tool which would disrupt the results of the study.

The questions included in both questionnaires have been deemed simple in structure thus making the back translation method sufficient and adequate for the purpose of this study.

3.3.3. Coding in Longitudinal Studies

As described in a previous section, longitudinal studies require follow-up observations of participants across a period of time. This could cause issues with regard to anonymity and traceability in the case of human-based studies (Saunders et al., 2015). After the first set of data is obtained, the researcher would be required to code the data in such a way as to preserve anonymity to the person while still being recognisable to the researcher himself for future data collection.

Audette et al. (2020) have described 4 different methods for coding data in longitudinal research:

1. Non-Anonymous Data Collection - a designated third-party researcher would link different datasets obtained together by means of identifiable information of a participant (with whom he/she has not met)
2. Pre-existing Unique Identifiers - use of numerical or alphabetical (or both) characters such as identification card numbers to label the dataset obtained. The participant would be asked to repeat the number so that the researcher could find the previous data set to add to it. It is important not to add any other sort of identifiable information

3. Electronic Anonymising System - use of online data collection software that assigns random codes
4. Self-Generated Identification Codes (SGIC)- based on combinations of different simple questions such as initials of a relative, number of siblings and month born in. on following

Self-Generated Identification Codes have been deemed most reliable by Audette et al. (2020). Direnga et al. (2016) opened up on this strategy by defining criteria of what SGIC should be; a) applicable to every person b) known to individuals but not the researcher, c) not changing in time, d) identifiable, e) easily understandable, f) non-confidential in nature, g) highly variable and h) unobservable characteristics of the person. This method was adopted for the purpose of this study.

3.3.4. Implementation of Tools

Upon meeting for the first appointment (T_0), participants were asked to fill in a simple data collection sheet that encompassed basic demographic data. The FHSQ and NAFF were answered in no particular order, either in Maltese or in English language according to the preference of the participant. During this time the researcher was present in the same room in case of any difficulties encountered by the patient whilst filling in the questionnaires. After completion, the podiatrist proceeded to assess, treat and provide advice/education to the patient as per normal standard practice. The questionnaires were filled prior to podiatric intervention in order to eliminate response bias. If participants were to fill in the questionnaires after the intervention, the education and advice he/she would gain could potentially impact the responses given.

3.3.5. Follow-Ups

Following the first appointment, three follow-up appointments (T_1. T_2 and T_3) were scheduled for a duration of 1 year at 4-month intervals. At each follow-up appointment, the participants were re-interviewed using the same questionnaires to identify any changes in responses from the prior session. Similarly to the first appointment, the questionnaires were given to the participants prior to any intervention to prevent response bias. The 4-month interval coincides with the review period given to routine cases by Podiatry clinics within the Primary Health Care setting.

On completion of the Data Collection process after 1 year, the results of the data were analysed. Comparison analysis was made to determine any changes in responses for both FHSQ and the NAFF between appointments. Further analysis was also conducted to compare the results between the different age groups.

3.3.2 Confidentiality

When gathering data from a subject, it is important to guarantee to the individual that no other person can easily access the information obtained once data is accessed (Al Tajir, 2018). Quoting the declaration of Helsinki: “Every precaution must be taken to protect the privacy of research subjects and the confidentiality of their personal information” Measures need to be taken place to ensure that no information is divulged, especially which can lead to the identification of the participants. Each researcher should present the plan taken to minimise the risk of breach of privacy and confidentiality prior to the commencement of data collection (Al Tajir, 2018). As stated by (Abadie, Fisher, & Dombrowski, 2021) it should be made sure on what the procedures to maintain confidentiality and privacy are in order to eliminate the risk of misunderstanding which could lead to conflict and lack of trust.

For the purpose of this study, the measure taken to ensure privacy and confidentiality is the use of SGICs as described in the previous section to acquire pseudonymity (Audette, Hammond, &

Rochester, 2020). Access to any data obtained was limited only to the researcher and the research supervisor. All data was stored in the personal laptop of the researcher, password protected and under lock and key.

3.4. Statistical Analysis

Due to the nature of this study being quantitative, open-ended or numeric data is collected in order to explain relationships between certain variables. After displaying all relevant data, statistical analysis (mainly software-aided) is performed to test hypotheses (Ali & Bhaskar, 2016).

(Guetterman, 2019) describes to following steps in approaching statistical analyses:

1) Formulate a hypothesis
2) Select a statistical test to use depending on the research question or the hypothesis
3) Determine the sample size by use of a Power Analysis
4) Set up data in an orderly manner
5) Commence with Descriptive Statistics
6) Check the assumption of the tests
7) Commence the analysis
8) Examine the relevance of the statistical model
9) Report the obtained results
10) Conclude with an assessment of the validity level.

Upon completion of data collection, all data recorded was tabulated in a clear and concise manner in a spreadsheet using Microsoft Office Excel 2011. Using Statistical Package for the Social Sciences (SPSS) version 28, statistical analysis was performed to identify significant differences in responses between different review dates for both Foot Health Status and Self-Care Score, thus any possible correlations between them can be brought to the surface.

The aim of this is to assess the impact of podiatric intervention on self-care practices in the older adult population between 4 review appointments. Similarly, the level of quality of life was compared. A test for normality of the data was conducted by using the Kolmogorov-Smirnov and Shapiro-Wilk tests. This is important to indicate whether a parametric test is used or a non-parametric test.

For the purpose of the statistical tests used in this study, a p-value of 0.05 level of significance was assumed. This means that for any p-value obtained under 0.05, the null hypothesis was rejected representing the presence of a significant difference. Conversely, for any p-value that was larger than 0.05, the null hypothesis was accepted denoting the absence of a significant difference. The level of significance is defined in medical research as the probability that an event occurred by chance. If this level is low, it means that the event was less likely to have occurred by chance, described also as being significant (Riffenburg, 2012).

A 0.05 level of significance is chosen in order to balance the probability between type I and type II errors. A type I error occurs when the researcher rejects the null hypothesis when in actuality it is truly representative of the population. On the other hand, a type II error occurs when the researcher accepts the null hypothesis which in fact is falsely represents the population (Banerjee, Chitnis, Jadhav, Bhawalkar, & Chaudhury, 2009).

For this study, the following analysis were done using the following tests

- Compare NAFF scores of the whole sample population using the Kruskal Wallis Test
- Compare the Total FHSQ scores of the whole sample population using the Kruskal-Wallis test
- Analysing the relationship between NAFF and Total FHSQ scores by using the Spearman Correlation test
- Compare NAFF scores between age groups using the Kruskal-Wallis test
- Compare NAFF scores between genders using the Kruskal Wallis test
- Compare NAFF scores between educational levels using the Kruskal Wallis Test

- Compare Total FHSQ scores between age groups using the Kruskal-Wallis test
- Compare Total FHSQ scores between genders using the Kruskal Wallis test
- Compare Total FHSQ scores between educational levels using the Kruskal Wallis test
- Compare scores of all domains of the FHSQ between age groups using the Kruskal-Wallis test
- Compare scores of all domains of the FHSQ between genders using the Kruskal Wallis test
- Compare scores of all domains of the FHSQ between educational levels using the Kruskal Wallis test

3.5. Conclusion

The nature of this methodology was deemed adequate in assessing the impact of the podiatric intervention on foot-related self-care in community-dwelling older adults. All necessary precautions were taken to ensure the safety of all parties involved in the study. All raw data collected remained secured and accessible only by the researcher. The following Chapter displays the statistical results obtained after data collection and processing.

CHAPTER 4

RESULTS

4.1. Demographic Data

A total of 120 people agreed to participate in the study with 11 choosing to opt out making the attrition rate of 9.17%. People chose to opt out primarily due to their lack of time and simply disinterest in continuing, leading to a total of 109 people who have completed the questionnaires 4 times throughout the period of 1 year. Table 4.1 summarises the characteristics of the population sample upon recruitment (Time 0). Data from the participants who opted out of the study were not included.

Age		
	Frequency	**Percent %**
65-74	47	43.1
75-84	44	40.4
85<	18	16.5
Locality		
South Region	39	35.8
North Region	35	32.1
Central Region	35	32.1
Educational Level		
Primary	47	43.1
Secondary	45	41.3
Post-Secondary	5	4.6
Tertiary	12	11.0
Smoking		
Yes	14	12.8
No	95	87.2
Exercise		
Yes	50	45.9
No	59	54.1

Table 4.1. Summary of characteristics of the study population sample at Time0

The above table shows that age groups 65-74 years and 75-84 years were amongst the most common to recruit with 43.1% and 40.4% respectively with the 85< year group being markedly less. For the purpose of this study, a similar number of patients were recruited from the Northern, Central and Southern areas of Malta for a better geographical representation. Education within the older population reached predominantly at a Primary level, with a Secondary level education being slightly less and the rest being even lower in frequency. Smoking and exercising habits were recorded from the Data Collection Sheet. 12.8% of the sample responded saying that they smoke and 45.9% do some sort of regular physical exercise

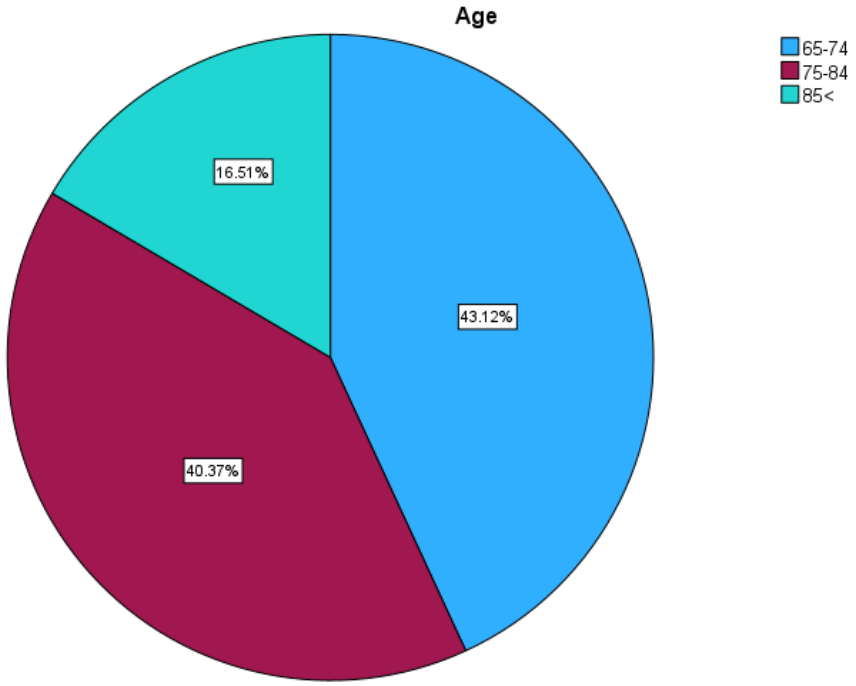


Chart 1: Frequency of Age

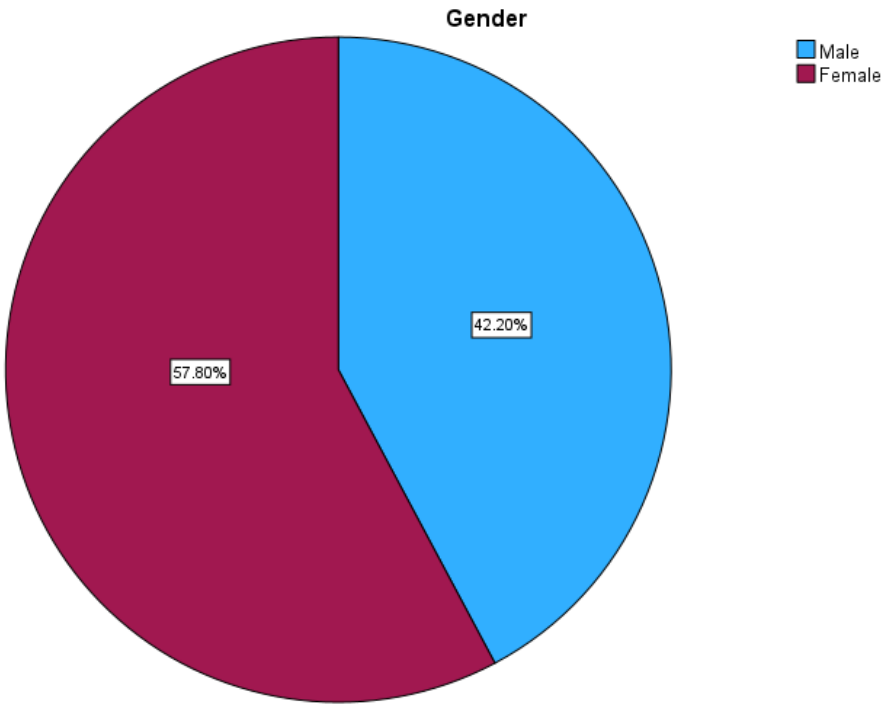


Chart 2: Frequency of Gender

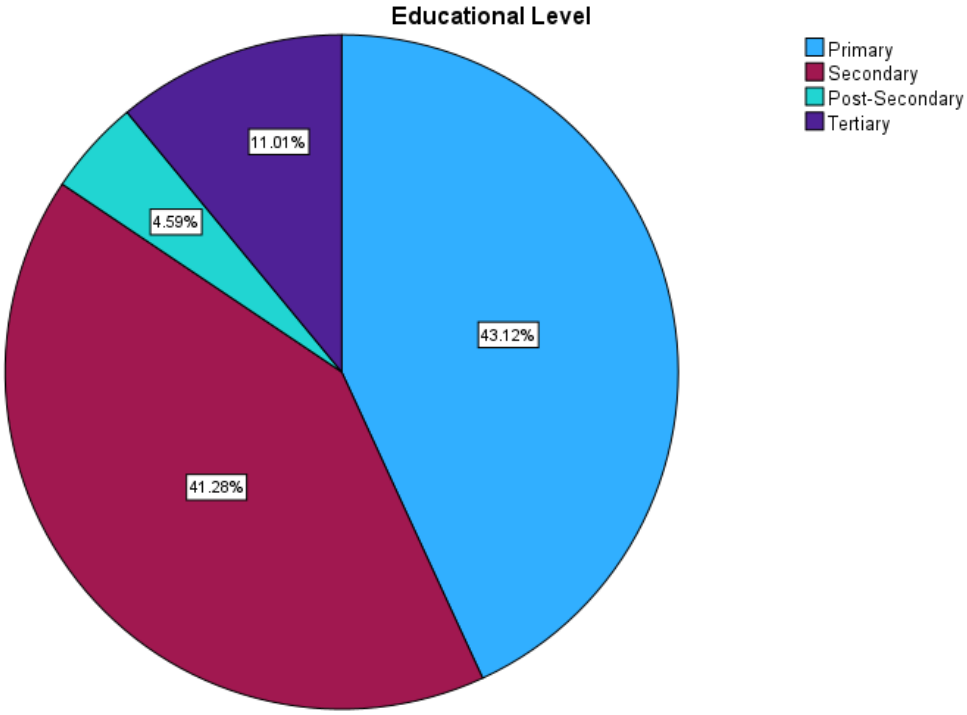


Chart 3: Frequency of Education Level

4.2. Descriptive Statistics

In all types of quantitative studies including those of medical topics, descriptive statistics are fundamental in deriving a summary of the sample taken without making any inferences from theories (Kaliyadan & Kulkarni, 2019). This is done by presenting distribution tables marking percentages and means of a certain variable within a given population.

4.2.1. Frequencies and Percentages

4.2.1.1 Reasons for Podiatric Intervention

Podiatric Intervention		
	Frequency	**Percent %**
New Case	6	5.5
Nail Care	85	78.0
Hyperkeratosis	62	56.9
Biomechanics	5	4.6
Dermatology	4	3.7
Diabetic Foot Assessment	28	25.7

Table 4.2. Frequency of Interventions by the Podiatrist

Listed above are the main reasons people attended the Podiatry clinic. They are not mutually exclusive; meaning that patients attended for one or more of the reasons above. The most common reason for podiatric care was for nail care with 78% of the population. The development of hyperkeratosis was the second most common reason (56.9%) for older people to attend the clinic

for debridement. Other less common reasons were for diabetic foot screening (25.7%) which was performed exclusively on those living with type 2 diabetes mellitus, biomechanical issues/injuries (4.6%) and other dermatological conditions (3.7%). Of the recruited patients 5.5% made use of the service for the first time meaning that undergone a full assessment along with any of the other interventions mentioned.

4.2.1.2. Co-morbidities/Other Medical History

Co-morbidities		
	Frequency	**Percent %**
Diabetes Mellitus	38	34.9
Arthritic Disorder	23	21.1
Hypertension	71	65.1
Hyperlipidaemia	58	53.2
Thyroid Disorder	13	11.9
Pulmonary Disorder	5	4.6
Depression	9	8.3
Immunosuppression	8	7.3

Table 4.3. Frequencies of Co-morbidities within the Population Sample

From the population sample, the most common co-morbidities encountered were hypertension and hyperlipidaemia (65.1% and 53.2% respectively) followed by diabetes at 34.9%. Arthritic disorders incorporate 21.1% while thyroid disorders incorporate 11.9%. The least common comorbidities encountered were pulmonary disorders (4.6%), depression (8.3%) and those currently on immunosuppression therapy 7.3%).

4.3. Test for Normality

Prior to any statistical tests, one must check whether the dataset obeys the normality assumption. Normality tests would then dictate the kind of statistical test that should be used. If the data obeys the normality assumption, nonparametric tests are used. On the other hand, if the normality assumption is not met, parametric tests are used (Kwak & Park, 2019). Normality is represented graphically by a curve on a histogram and its nature; if the curve is skewed, the data would not be normally distributed, while a non-skewed curve would indicate normal distribution. In order to test for normality, the Shapiro-Wilk Test or the Kolmogorov-Smirnov Test can be used (Ghasemi & Zahediasl, 2012). For the purpose of this study, both the Shapiro-Wilk and Kolmogorov-Smirnov Tests were used.

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
NAFF Score	.111	436	<.001	.949	436	<.001
Total FHSQ Score	.080	436	<.001	.973	436	<.001
Foot Pain	.222	436	<.001	.808	436	<.001
Foot Function	.230	436	<.001	.892	436	<.001
General Foot Health	.217	436	<.001	.905	436	<.001
Footwear	.141	436	<.001	.946	436	<.001
General Health	.341	436	<.001	.218	436	<.001
Physical Activity	.115	436	<.001	.969	436	<.001
Social Capacity	.323	436	<.001	.738	436	<.001
Vigor	.108	436	<.001	.979	436	<.001

Table 4.4. Test of Normality

According to both the Shapiro-Wilk test and Kolmogorov-Smirnov tests, the p-value of all variables is less than the 0.05 level of significance, which indicates that the distributions violate the normality assumption. For this reason, non-parametric tests were used for further analysis.

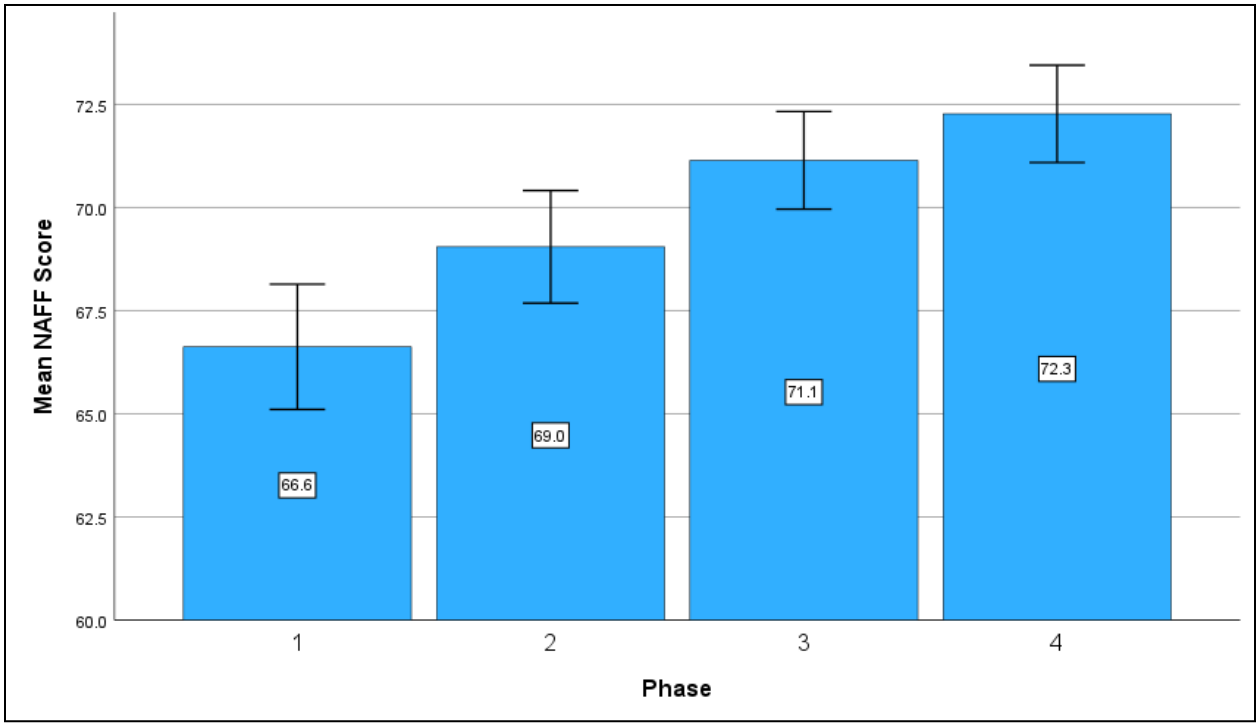
4.4. NAFF Score and Total FHSQ Score

The Kruskal-Wallis test was used to compare mean NAFF and Total FHSQ scores between the four phases. The null hypothesis specifies that the mean scores vary marginally between the four phases and is accepted if the p-value exceeds the 0.05 level of significance. The alternative hypothesis specifies that the mean scores vary significantly between the four phases, and is accepted if the p-value is less than the 0.05 criterion.

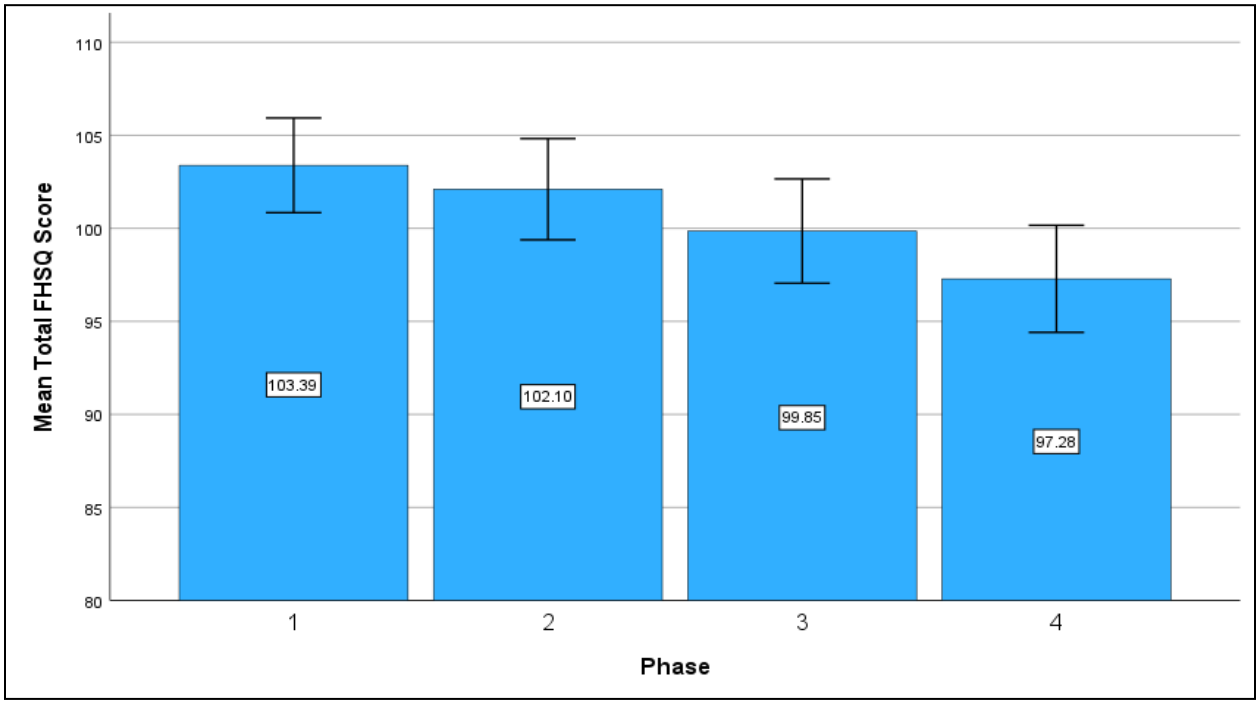
		Sample size	Mean	Std. Deviation	P-value
NAFF Score	T_0	109	66.624	7.993	<0.001
	T_1	109	69.048	7.190	
	T_2	109	71.145	6.231	
	T_3	109	72.270	6.212	
Total FHSQ Score	T_0	109	103.385	13.384	0.012
	T_1	109	102.101	14.326	
	T_2	109	99.853	14.750	
	T_3	109	97.284	15.155	

Table 4.5: Kruskal Wallis test for NAFF Score and Total FHSQ Score between T_0 and T_3

The mean NAFF score in phase 4 (72.27) is significantly larger than the mean NAFF score in phase 1 (66.624) and the mean total FHSQ score in phase 4 (97.284) is significantly smaller than the mean total FHSQ score in phase 1 (103.385) since both p-values are smaller than the 0.05 level of significance.



Graph 1: Bar Graph of the mean NAFF Scores between T_0 and T_3



Graph 2: Bar Graph of the mean Total FHSQ Scores between T_0 and T_3

The error bar graphs display the 95% confidence intervals of the actual mean NAFF/FHSQ scores for each phase. Statistical significance is attained whenever two confidence intervals do not overlap.

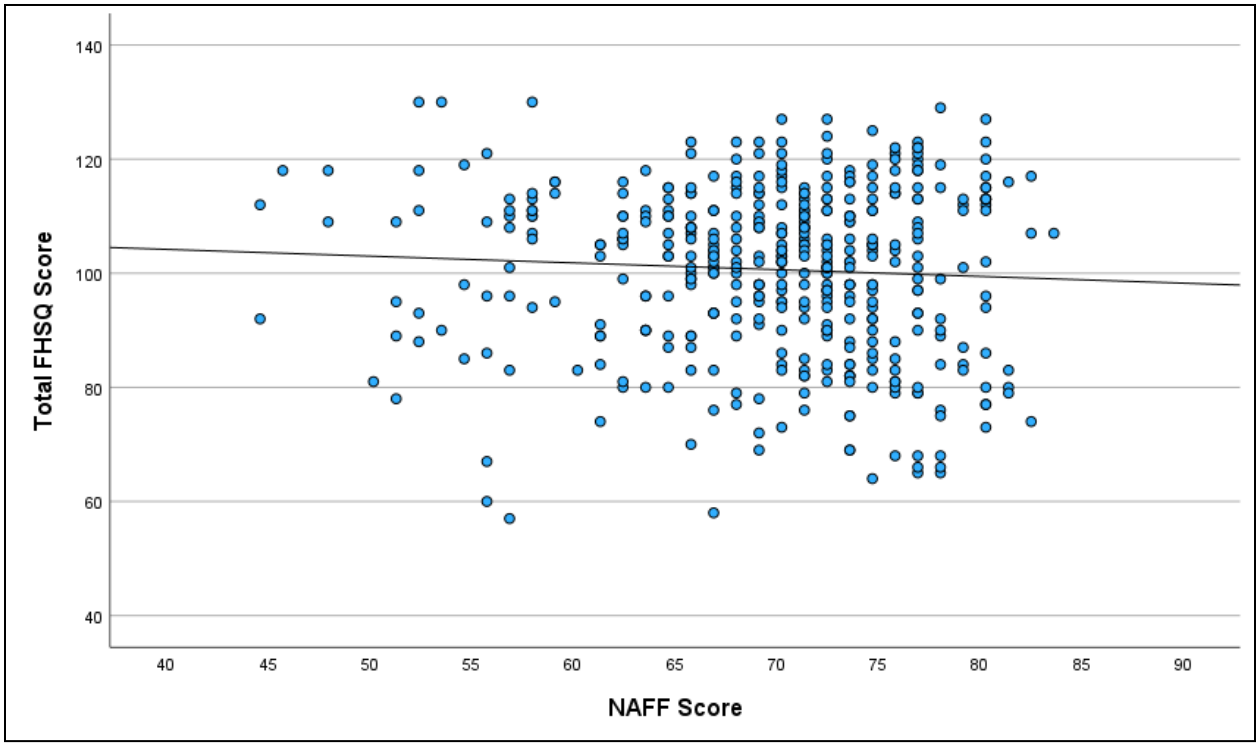
4.5. Spearman Coefficient between NAFF and FHSQ

The Spearman Correlation Coefficient measures the strength of the relationship between two continuous variables and it ranges from -1 to 1. A correlation coefficient close to 1 indicates a strong positive relationship between the two variables; a correlation coefficient close to -1 indicates a strong negative relationship; while a correlation coefficient close to 0 indicates no relationship between the two variables. The Spearman correlation (non-parametric) test is used to investigate whether a relationship between two variables is significant or not. The null hypothesis specifies that there is no relationship between the two variables and is accepted if the p-value exceeds the 0.05 level of significance. The alternative hypothesis specifies that there is a significant relationship between the two variables and is accepted if the p-value is less than the 0.05 criterion.

			Total FHSQ Score
Spearman's rho	NAFF Score	Correlation Coefficient	-.050
		P-value	.296

Table 4.6: Spearman Correlation

The Spearman correlation coefficient (-0.050) is close to 0 indicating a very weak relationship between the NAFF and FHSQ scores. Moreover, this relationship is not significant since the p-value (0.296) is larger than the 0.05 level of significance.



Graph 3: Scatter-Plot of the correlation between NAFF Score and Total FHSQ Score

4.6. NAFF Score

The Shapiro-Wilk p-value is smaller than the 0.05 level of significance, which indicates that the NAFF score distribution violates the normality assumption. For this reason, non-parametric tests were used to analyse the NAFF scores further.

The Kruskal-Wallis test was used to compare the mean NAFF scores between groups of participants clustered by age, gender, and education level. The null hypothesis specifies that the mean NAFF scores vary marginally between the groups and is accepted if the p-value exceeds the 0.05 level of significance. The alternative hypothesis specifies that the mean NAFF scores vary significantly between the groups and is accepted if the p-value is less than the 0.05 criterion.

4.6.1. NAFF Score and Age

Age	Time	Mean	Std. Deviation	P-Value
65-74 years	0	67.4699	7.92222	<0.001
	1	70.4680	7.01009	
	2	73.0697	5.93155	
	3	74.3086	5.68121	
75-84 years	0	66.1243	7.93965	0.007
	1	68.2089	6.86248	
	2	69.9784	6.05798	
	3	71.6751	5.77538	
85 years or more	0	65.7850	8.56021	0.539
	1	67.6433	8.20246	
	2	69.3158	6.43651	
	3	68.6964	6.91722	

Table 4.7. Kruskal Wallis test for NAFF Score and Age groups between T_0 and T_3

The p-values of age groups 65-74 and 75-84 are both below the 0.05 criterion thus the alternative hypothesis is accepted. This means that the NAFF score of these age groups differs significantly between phases. Conversely, the p-value is above 0.05 thus accepting the null hypothesis meaning that there is a marginal difference between phases of the 85< year age group.

4.6.2. NAFF Score and Gender

Gender	Time	Mean	Std. Deviation	P-Value
Male	0	66.9000	8.74405	0.003
	1	67.8911	7.01752	
	2	68.8822	6.95821	
	3	67.8911	7.27841	
Female	0	64.6700	8.74405	<0.001
	1	67.3956	9.67405	
	2	69.7494	6.26068	
	3	69.5017	6.87332	

Table 4.8. Kruskal Wallis test for NAFF Score and Gender between T_0 and T_3

The p-values of both gender groups are below the 0.05 criterion thus the alternative hypothesis is accepted. This means that there is a significant difference in the NAFF of these groups between phases.

4.6.3. NAFF Score and Educational Level

Education level	Time	Mean	Std. Deviation	P-Value
Primary	0	67.2084	8.15950	0.004
	1	69.3910	7.67304	
	2	71.2414	6.50664	
	3	72.4987	6.41989	
Secondary	0	67.3708	6.90813	0.001
	1	69.7128	5.80860	
	2	71.3853	5.33647	
	3	72.5510	5.38988	
Post-secondary	0	64.0010	8.69414	0.314
	1	68.3867	8.68460	
	2	72.1033	6.52696	
	3	71.7317	5.35510	
Tertiary	0	62.6258	10.30541	0.145
	1	65.5992	8.93055	
	2	69.4088	8.33204	
	3	70.6167	8.73219	

Table 4.9. Kruskal Wallis test for NAFF Score and Educational Level between T_0 and T_3

The p-values of the Primary and Secondary groups are both below the 0.05 criterion thus the alternative hypothesis is accepted. This means that the NAFF score of these education groups differs significantly between phases. Conversely, post-secondary and tertiary groups resulted in a p-value above 0.05 meaning that there is marginal difference in NAFF score between phases.

4.7. FHSQ

4.7.1. Total FHSQ Score and Age

Age	Time	Mean	Std. Deviation	P-Value
65-74 years	0	106.2667	15.22319	0.399
	1	105.4000	16.04312	
	2	103.4889	16.42839	
	3	101.3556	16.41529	
75-84 years	0	102.1739	10.71303	0.126
	1	100.4348	12.13196	
	2	98.3043	12.88387	
	3	96.1739	13.57826	
85 years or more	0	99.2778	13.80454	0.161
	1	98.1111	13.95745	
	2	94.7222	13.22122	
	3	89.9444	13.01796	

Table 4.10. Kruskal Wallis test for Total FHSQ Score and Age Group between T_0 and T_3

The p-values of all age groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that in all age groups, there is a marginal difference in the total FHSQ Score between phases.

4.7.2. Total FHSQ Score and Gender

Gender	Time	Mean	Std. Deviation	P-Value
Male	0	104.5000	12.58526	0.276
	1	103.3913	13.24551	
	2	101.6522	13.47626	
	3	99.3913	14.57773	
Female	0	102.5714	13.98123	0.073
	1	101.1587	15.09989	
	2	98.5397	15.58828	
	3	95.7460	15.49711	

Table 4.11. Kruskal Wallis test for Total FHSQ Score and Gender between T_0 and T_3

The p-values of both gender groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that in both gender groups, there is a marginal difference in the total FHSQ Score between phases.

4.7.3. Total FHSQ Score and Educational Level

Education level	Phase	Mean	Std. Deviation	P-Value
Primary	0	101.8723	14.38389	0.102
	1	100.9574	15.40745	
	2	98.6170	15.67684	
	3	95.1277	15.55861	
Secondary	0	104.0444	11.09045	0.315
	1	102.1364	12.47619	
	2	100.2955	12.97507	
	3	98.5682	14.06695	
Post-secondary	0	111.8000	2.58844	0.085
	1	106.8333	9.82683	
	2	102.5000	9.89444	
	3	99.1667	10.77806	
Tertiary	0	103.3333	18.85029	0.966
	1	104.0833	18.64724	
	2	101.7500	19.76280	
	3	100.0833	19.48173	

Table 4.12. Kruskal Wallis test for Total FHSQ Score and Educational Level between T_0 and T_3

The p-values of all groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that in all educational level groups, there is a marginal difference in the total FHSQ Score between phases.

4.7.4. Foot Pain and Age

Age	Time	Mean	Std. Deviation	P-Value
65-74 years	0	17.0000	3.92544	0.966
	1	17.1111	3.97848	
	2	17.1778	3.83340	
	3	17.0444	4.03370	
75-84 years	0	16.3478	4.16449	0.969
	1	16.4565	4.15107	
	2	16.4783	3.92564	
	3	16.1957	3.94754	
85 years or more	0	17.3333	2.76533	0.472
	1	18.0556	2.73264	
	2	17.0000	2.70076	
	3	17.0000	2.84915	

Table 4.13. Kruskal Wallis test for Foot Pain Score and Age Groups between T_0 and T3

The p-values of all groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that in all age groups, there is a marginal difference in the Foot Pain Score between phases.

4.7.5. Foot Pain and Gender

Gender	Time	Mean	Std. Deviation	P-Value
Male	0	17.3478	4.16449	0.591
	1	17.4565	4.05904	
	2	17.3696	3.69600	
	3	17.0217	3.66054	
Female	0	16.3651	3.58897	0.886
	1	16.6508	3.75525	
	2	16.4762	3.68019	
	3	16.4286	3.93788	

Table 4.14. Kruskal Wallis test for Foot Pain Score and Gender between T_0 and T_3

The p-values of both gender groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in Foot Pain Score between phases.

4.7.6. Foot Pain and Educational Level

Education level	Time	Mean	Std. Deviation	P-Value
Primary	0	16.6383	3.45421	0.789
	1	17.0000	3.58135	
	2	16.7872	3.54435	
	3	16.4255	3.71100	
Secondary	0	16.4000	4.30855	0.949
	1	16.6818	4.32286	
	2	16.7955	3.90336	
	3	16.9318	3.87237	
Post-secondary	0	19.4000	.89443	0.367
	1	17.5000	3.88587	
	2	16.6667	4.17931	
	3	14.8333	4.49073	
Tertiary	0	17.6667	4.09730	0.980
	1	17.8333	3.68864	
	2	17.4167	3.70401	
	3	17.6667	3.77391	

Table 4.15. Kruskal Wallis test for Foot Pain Score and Educational Level between T_0 and T_3

The p-values of all educational level groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in Foot Pain Score between phases.

4.7.7. Foot Function and Age

Age	Time	Mean	Std. Deviation	P-Value
65-74 years	0	15.7556	2.86162	0.699
	1	15.7111	2.78488	
	2	15.4222	2.65851	
	3	15.2889	2.73548	
75-84 years	0	14.7174	2.40058	0.565
	1	14.5435	2.41022	
	2	14.3261	2.42262	
	3	14.2826	2.55311	
85 years or more	0	15.0000	2.05798	0.140
	1	14.3889	2.00408	
	2	14.0000	2.22288	
	3	13.4444	2.22875	

Table 4.16. Kruskal Wallis test for Foot Function Score and Age between T_0 and T_3

The p-values of all age groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in foot function between phases.

4.7.8. Foot Function and Gender

Gender	Time	Mean	Std. Deviation	P-Value
Male	0	14.7778	2.38630	0.829
	1	14.7778	2.10819	
	2	14.3333	2.73861	
	3	13.8889	2.31541	
Female	0	15.2222	1.78730	0.150
	1	14.0000	1.93649	
	2	13.6667	1.65831	
	3	13.0000	2.17945	

Table 4.17. Kruskal Wallis test for Foot Function Score and Gender between T_0 and T_3

The p-values of both gender groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in foot function between phases.

4.7.9. Foot Function and Educational Level

Education level	Time	Mean	Std. Deviation	P-Value
Primary	0	15.2128	2.97772	0.145
	1	15.1064	2.98718	
	2	14.6596	2.73684	
	3	14.4468	2.77260	
Secondary	0	15.0889	1.97510	0.904
	1	14.8636	2.07522	
	2	14.7500	2.25291	
	3	14.6818	2.43781	
Post-secondary	0	16.0000	0.00000	0.327
	1	15.6667	1.03280	
	2	15.3333	0.81650	
	3	14.6667	1.96638	
Tertiary	0	15.1667	3.48590	0.951
	1	14.7500	3.07852	
	2	14.5833	3.42340	
	3	14.5000	3.39786	

Table 4.18. Kruskal Wallis test for Foot Function Score and Educational Level between T_0 and T_3

The p-values of all educational groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in foot function between phases.

4.7.10. General Foot Health and Age

Age	Time	Mean	Std. Deviation	P-Value
65-74 years	0	6.4222	2.08336	0.906
	1	6.4667	2.06265	
	2	6.3556	2.02435	
	3	6.2222	1.92931	
75-84 years	0	6.3043	1.41216	0.189
	1	6.1957	1.43944	
	2	5.8696	1.51450	
	3	5.6957	1.69797	
85 years or more	0	6.0556	1.86207	0.807
	1	6.2778	1.74240	
	2	5.8333	1.65387	
	3	5.7778	1.59247	

Table 4.19. Kruskal Wallis test for General Foot Health Score and Age between T_0 and T_3

The p-values of all age groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in the General Foot Health Score between phases.

4.7.11. General Foot Health and Gender

Gender	Time	Mean	Std. Deviation	P-Value
Male	0	6.1522	1.83748	0.985
	1	6.2174	1.84888	
	2	6.1522	1.84953	
	3	6.0870	1.89533	
Female	0	6.4286	1.73869	
	1	6.3968	1.69952	0.113
	2	6.0000	1.71333	
	3	5.8095	1.70253	

Table 4.20. Kruskal Wallis test for General Foot Health Score and Gender between T_0 and T_3

The p-values of both gender groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that in both groups there is a marginal difference in General Foot Health Score between phases.

4.7.12. General Foot Health and Educational Level

Education level	Time	Mean	Std. Deviation	P-Value
Primary	0	6.2128	1.86427	0.616
	1	6.2553	1.85880	
	2	6.0213	1.78751	
	3	5.8298	1.77322	
Secondary	0	6.3556	1.52488	0.473
	1	6.3182	1.47495	
	2	6.0227	1.64936	
	3	5.8636	1.79911	
Post-secondary	0	6.6000	1.34164	0.911
	1	6.5000	1.37840	
	2	6.1667	1.60208	
	3	6.1667	1.60208	
Tertiary	0	6.4167	2.53909	0.978
	1	6.5000	2.54058	
	2	6.3333	2.30940	
	3	6.4167	1.97523	

Table 4.21. Kruskal Wallis test for General Foot Health Score and Educational Level between T_0 and T_3

The p-values of all educational groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in the General Foot Health Score between phases.

4.7.13. Footwear and Age

Age	Time	Mean	Std. Deviation	P-Value
65-74 years	0	9.8222	3.19295	0.971
	1	9.9556	3.23304	
	2	10.0667	3.17232	
	3	10.0222	3.13694	
75-84 years	0	9.3261	3.24588	0.997
	1	9.3261	3.14151	
	2	9.3478	3.12138	
	3	9.4783	3.19541	
85 years or more	0	9.5556	3.43378	0.998
	1	9.7222	3.39213	
	2	9.7222	3.39213	
	3	9.7222	3.49463	

Table 4.22. Kruskal Wallis test for Footwear Score and Age between T_0 and T_3

The p-values of all age groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in Footwear Score between phases.

4.7.14. Footwear and Gender

Gender	Time	Mean	Std. Deviation	P-Value
Male	0	9.6304	3.21357	0.991
	1	9.8043	3.26340	
	2	9.8478	3.26576	
	3	9.8261	3.36191	
Female	0	9.5238	3.27186	0.994
	1	9.5397	3.18173	
	2	9.6032	3.12915	
	3	9.6825	3.10476	

Table 4.23. Kruskal Wallis test for Footwear Score and Gender between T_0 and T_3

The p-values of both gender groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that in both groups there is a marginal difference in Footwear Score between phases.

4.7.15. Footwear and Educational Level

Education level	Time	Mean	Std. Deviation	P-Value
Primary	0	9.3404	3.21867	0.996
	1	9.4681	3.16812	
	2	9.4894	3.14762	
	3	9.5106	3.28284	
Secondary	0	9.8222	3.29799	0.993
	1	9.7727	3.22680	
	2	9.8409	3.21293	
	3	9.9545	3.19851	
Post-secondary	0	11.2000	1.64317	0.974
	1	11.0000	1.54919	
	2	11.0000	1.54919	
	3	10.8333	1.32916	
Tertiary	0	8.8333	3.53768	0.967
	1	9.2500	3.95716	
	2	9.4167	3.84846	
	3	9.3333	3.67630	

Table 4.24. Kruskal Wallis test for Footwear Score and Educational Level between T_0 and T_3

The p-values of all educational groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in Footwear Score between phases.

4.7.16. General Health and Age

Age	Time	Mean	Std. Deviation	P-Value
65-74 years	0	2.3556	.64511	0.902
	1	2.3556	.60886	
	2	2.2889	.58861	
	3	3.0000	4.46196	
75-84 years	0	2.3261	.51873	0.758
	1	2.3261	.51873	
	2	2.2609	.49147	
	3	2.2391	.48004	
85 years or more	0	2.2222	.73208	0.987
	1	2.1667	.70711	
	2	2.1667	.70711	
	3	2.2222	.73208	

Table 4.25. Kruskal Wallis test for General Health Score and Age between T_0 and T_3

The p-values of all age groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in the General Foot Health Score between phases.

4.7.17. General Health and Gender

Gender	Time	Mean	Std. Deviation	P-Value
Male	0	2.3043	.62786	0.571
	1	2.2826	.62050	
	2	2.1957	.58193	
	3	2.1739	.52933	
Female	0	2.3333	.59568	0.914
	1	2.3333	.56796	
	2	2.3016	.55750	
	3	2.3651	.60379	

Table 4.26. Kruskal Wallis test for General Health Score and Gender between T_0 and T_3

The p-values of both gender groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that in both groups there is a marginal difference in General Health Score between phases.

4.7.18. General Health and Educational Level

Education level	Time	Mean	Std. Deviation	P-Value
Primary	0	2.2553	.60678	0.959
	1	2.2340	.59756	
	2	2.2128	.58741	
	3	2.2766	.57868	
Secondary	0	2.3111	.59628	0.921
	1	2.3182	.56126	
	2	2.2500	.53374	
	3	2.2955	.59375	
Post-secondary	0	2.4000	.54772	0.115
	1	2.3333	.51640	
	2	2.0000	.00000	
	3	1.8333	.40825	
Tertiary	0	2.5833	.66856	0.903
	1	2.5833	.66856	
	2	2.5833	.66856	
	3	2.5000	.52223	

Table 4.27. Kruskal Wallis test for General Health Score and Educational Level between T_0 and T_3

The p-values of all educational groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in General Health Score between phases.

4.7.19. Physical Activity and Age

Age	Time	Mean	Std. Deviation	P-Value
65-74 years	0	22.9111	2.76193	0.006
	1	22.1333	3.25856	
	2	21.4667	3.36155	
	3	20.5111	3.41535	
75-84 years	0	21.6087	3.14451	0.006
	1	20.8913	3.35479	
	2	20.0652	3.30926	
	3	19.0217	3.61164	
85 years or more	0	19.8889	3.73991	0.011
	1	18.5556	4.10484	
	2	17.5556	3.94405	
	3	15.5000	3.53553	

Table 4.28. Kruskal Wallis test for Physical Activity and Age between T_0 and T_3

The p-values of all age groups are below the 0.05 criterion thus the alternate hypothesis is accepted. This means that there is a significant difference in Physical Activity between phases.

4.7.20. Physical Activity and Gender

Gender	Time	Mean	Std. Deviation	P-Value
Male	0	22.1304	3.13836	0.010
	1	21.3696	3.77335	
	2	20.6304	3.76746	
	3	19.5652	4.05875	
Female	0	21.6667	3.34085	<0.001
	1	20.7619	3.53651	
	2	19.9365	3.59602	
	3	18.6825	3.75382	

Table 4.29. Kruskal Wallis test for Physical Activity and Gender between T_0 and T_3

The p-values of both gender groups are below the 0.05 criterion thus the alternate hypothesis is accepted. This means that in both groups there is a significant difference in Physical Activity between phases.

4.7.22. Physical Activity and Educational Level

Education level	Time	Mean	Std. Deviation	P-Value
Primary	0	21.3830	3.40430	<0.001
	1	20.4255	3.49375	
	2	19.7234	3.71660	
	3	18.3191	3.83409	
Secondary	0	22.2444	2.96307	0.002
	1	21.0682	3.63060	
	2	20.2273	3.54285	
	3	19.2955	3.86745	
Post-secondary	0	23.4000	.89443	0.209
	1	23.3333	3.55903	
	2	22.3333	2.87518	
	3	21.0000	2.89828	
Tertiary	0	21.6667	4.14144	0.580
	1	22.0000	3.97721	
	2	21.1667	4.13045	
	3	20.0833	4.37884	

Table 4.30. Kruskal Wallis test for Physical Activity and Educational Level between T_0 and T_3

The p-values of both Primary and Secondary level educational groups are below the 0.05 criterion thus the alternate hypothesis is accepted. This means that there is a significant difference in Physical Activity between phases. Conversely, the p-values of the Post-Secondary and Tertiary level educational groups are above 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in Physical Activity between phases.

4.7.23. Social Capacity and Age

Age	Time	Mean	Std. Deviation	P-Value
65-74 years	0	8.8222	1.48154	0.990
	1	8.9333	1.35512	
	2	8.8889	1.35214	
	3	8.9333	1.37179	
75-84 years	0	9.0870	1.29660	0.994
	1	9.0435	1.33261	
	2	9.0000	1.34990	
	3	9.0652	1.32333	
85 years or more	0	9.0556	1.16175	0.938
	1	9.0000	1.32842	
	2	9.0000	1.49509	
	3	9.1111	1.52966	

Table 4.31. Kruskal Wallis test for Social Capacity and Age between T_0 and T3

The p-values of all age groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in Social Capacity between phases.

4.7.24. Social Capacity and Gender

Gender	Time	Mean	Std. Deviation	P-Value
Male	0	8.9348	1.48177	0.944
	1	8.9565	1.53415	
	2	8.8913	1.59483	
	3	9.0652	1.43608	
Female	0	9.0000	1.25724	0.998
	1	9.0159	1.17077	
	2	9.0000	1.17775	
	3	8.9841	1.32582	

Table 4.32. Kruskal Wallis test for Social Capacity and Gender between T_0 and T_3

The p-values of both gender groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that in both groups there is no significant difference in Social Capacity between phases.

4.7.25. Social Capacity and Educational Level

Education level	Time	Mean	Std. Deviation	P-Value
Primary	0	9.1702	1.10962	0.984
	1	9.1277	1.20897	
	2	9.1064	1.30607	
	3	9.1702	1.29076	
Secondary	0	9.0000	1.29685	0.956
	1	8.9545	1.31104	
	2	8.8864	1.29787	
	3	9.0000	1.31184	
Post-secondary	0	9.2000	1.09545	0.950
	1	9.1667	.98319	
	2	9.1667	.98319	
	3	8.3333	2.33809	
Tertiary	0	8.0000	2.08893	0.826
	1	8.5000	1.93061	
	2	8.5000	1.93061	
	3	8.8333	1.33712	

Table 4.33. Kruskal Wallis test for Social Capacity and Educational Level between T_0 and T_3

The p-values of all educational level groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in Social Capacity between phases.

4.7.26. Vigor and Age

Age	Time	Mean	Std. Deviation	P-Value
65-74 years	0	13.6889	3.39667	0.291
	1	13.6222	3.44627	
	2	13.1778	3.45286	
	3	12.4889	3.28649	
75-84 years	0	13.2826	2.23769	0.045
	1	12.9783	2.37102	
	2	12.6522	2.38716	
	3	12.0000	2.41293	
85 years or more	0	11.6667	3.18082	0.601
	1	11.7778	3.38779	
	2	11.5000	3.29438	
	3	10.6667	2.86972	

Table 4.34. Kruskal Wallis test for Vigor Score and Age between T_0 and T_3

The p-value of the 75–84-year age group is below the 0.05 criterion thus accepting the alternative hypotheses. This signifies that there is a significant difference in Vigor Score between phases. Conversely, the p-values of the other age groups are above the 0.05 criterion thus the alternative hypothesis is accepted. This means that there is a marginal difference in Vigor Score between phases.

4.7.27. Vigor and Gender

Gender	Time	Mean	Std. Deviation	P-Value
Male	0	13.4783	2.90394	0.300
	1	13.3913	2.97006	
	2	13.0435	2.88256	
	3	12.4130	2.85639	
Female	0	12.9683	3.03723	0.053
	1	12.7937	3.13234	
	2	12.4127	3.15531	
	3	11.6667	2.94575	

Table 4.35. Kruskal Wallis test for Vigor Score and Gender between T_0 and T_3

The p-values of both gender groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that in both groups there is only a marginal difference in Vigor Score between phases.

4.7.28. Vigor and Educational Level

Education level	Time	Mean	Std. Deviation	P-Value
Primary	0	12.8936	3.05197	0.120
	1	12.8298	3.15759	
	2	12.4255	3.06980	
	3	11.5745	3.01982	
Secondary	0	13.4444	2.87272	0.269
	1	13.1136	2.87099	
	2	12.8182	2.93553	
	3	12.2727	2.67080	
Post-secondary	0	14.2000	1.64317	0.281
	1	13.8333	1.60208	
	2	13.0000	.89443	
	3	12.3333	1.86190	
Tertiary	0	12.9167	3.60450	0.920
	1	13.2500	4.07040	
	2	13.0000	4.13412	
	3	12.3333	3.84550	

Table 4.36. Kruskal Wallis test for Vigor Score and Educational Level between T_0 and T_3

The p-values of all educational level groups are above the 0.05 criterion thus the null hypothesis is accepted. This means that there is a marginal difference in Vigor Score between phases.

4.8. Conclusion

In conclusion, through the statistical tests performed it was found that between T_0 and T_3:

- NAFF scores improved significantly within the whole sample
- Total FHSQ diminished significantly within the whole sample
- There is no existing correlation between NAFF and Total FHSQ scores
- NAFF scores improved significantly between all age groups, gender groups and within primary and secondary educational levels

- Total FHSQ scores did not change significantly between age groups, gender groups and educational level groups
- Foot Pain scores did not change significantly between age groups, gender groups and educational level groups
- Foot Function scores did not change significantly between age groups, gender groups and educational level groups
- General Foot Health scores did not change significantly between age groups, gender groups and educational level groups
- Footwear scores did not change significantly between age groups, gender groups and educational level groups
- General Health scores did not change significantly between age groups, gender groups and educational level groups
- Physical Activity scores differed significantly between all age groups, gender groups and in the primary and secondary educational level groups
- Social Capacity scores did not change significantly between age groups, gender groups and educational level groups
- Social Capacity scores did not change significantly between age groups, gender groups and educational level groups
- Vigor scores changed significantly in the 74–85-year-old age group only.

CHAPTER 5

DISCUSSION

5.1. Introduction

The purpose of a discussion is to serve as a forum to critique the results obtained while comparing and relating to already observed knowledge in previous research. It is used to imply the consequences of the results obtained while presenting concise arguments so as to explain any phenomenon leading to such outcomes (Masic, 2018). A research discussion is used as a bridgeway point between the results obtained from the current, the results of previous related studies and newly formulated opinions (Şanlı et al., 2013).

The aim of this study was to identify any significant differences in foot health status and foot-related self-care practices after regular visits to the Podiatry Clinic in the elderly population who live independently in the community. This was conducted by using the Foot Health Status Questionnaire (FHSQ) and Nottingham Assessment for Functional Footcare (NAFF) respectively.

The findings of this study suggest that the levels of foot-related self-care improved after visits to the podiatrist. Conversely, foot-related quality of life seemed to have diminished throughout the year. In this chapter, the results obtained and analysed in Chapter 4 are critically discussed and compared to known literature and performed studies.

5.2. Comparing NAFF Scores

The NAFF is a 26-item questionnaire that uses the Likert scale system to measure foot-related self-care practices. According to the tool instructions, the NAFF score is obtained by adding all the individual scores of the items and multiplying by 1.115 integers. This makes the minimum possible score for the tool 0 and a maximum of 89.7. The findings of this study suggest that through podiatric consultation and intervention, there was a significant improvement in NAFF scores within the whole sample population between review dates. There is no official cut-off point or classification for this tool of what constitutes an optimal level of self-care behaviour, however, one can deduce by comparing the obtained means with the maximum possible score that the sample population obtained favourable mean scores at T_0 (66.624) which improved further by T_3 (72.270). The find shows notable improved scores from what Bartolo (2013) had found almost ten years

prior. The aim of her local study was to assess foot care behaviour and knowledge using NAFF as well on older adults living with type II diabetes (Bartolo, 2012). It was found that foot care knowledge and practices at the time were deemed suboptimal in that sample population (ranging from 54.73 to 55.43).

Authors of this tool however still suggest that a score lower than 50 is indicative of low foot care practices and would require further evaluation (Senussi, Lincoln, & Jeffcoate, 2011). By comparing the results obtained by Bartolo (2012) to the current study, higher mean NAFF scores signify an improvement in self-care practices within the older population in Malta. However, this study did not limit the sample to those living with specific conditions such as diabetes. Comparing NAFF scores is limited as there are no studies that measure the level of self-care practices specifically with the use of NAFF within a population not exclusively living with diabetes. Nevertheless, the means obtained could indicate the positive impact that podiatric outreach and intervention has made in the older population throughout the years. A similar study that targeted the diabetic population using the NAFF found that people who did not have diabetic complications scored lower on self-care practices than those with a current or history of foot complications. This indicated that previous experience or presence of foot complications are precursors to seeking medical advice and as a result taking more action towards self-care (Alsaleh et al., 2021).

Age

The mean NAFF scores for all age groups improved between reviews. This shows that podiatric intervention has made a significant impact, especially those of the 65-74 (67.47-74.31) and 75-84 (66.12-71.68) age groups. Mean scores for the 85< age improved also although marginally. This could be attributed to the fact that only 18 people were recruited (65.79-68.70) in the sample and increased physical limitations associated with advanced age. This finding is similar to what was found when measuring the impact of educational interventions in self-care for those living with diabetes. They made use of an hour-long informative talk to educate participants on foot care and using 2 tools that similarly measure levels of self-care and foot pain. After 1 month, they noticed significant improvements in self-care practices highlighting the importance of podiatric-led foot education (Reina-Bueno et al., 2023).

Gender

Both males and females have shown significant improvements in their NAFF scores (66.90-67.89 and 64.67-69.50 respectively) after a visit with the podiatrist. Although not significantly different, the female group exhibited slightly more change than the males. This finding is similar to that found by López-López et al. (2018) as they explained that females were more proactive in taking care of their health than males. They also noted that females scored lower in other health-related domains when using the FHSQ. The current study has also shown more positive mean scores than a study conducted by Mekonen and Demissie (2022) in Ethiopia. From their results, it had been found that males (54% more than females) had significantly lower scores than those found in this local study. Similarly, this gender difference was thought to be attributed to women performing more positive healthcare essential practices. Additionally, in their study, they also identified differences in scores between those living in rural and urban areas. It was not taken into account for this study since Malta is a relatively small island and healthcare has improved its outreach all over the island.

Educational Level

People with Primary, secondary and tertiary levels of education exhibited a significant increase in mean NAFF scores throughout the 1 year. Those with post-secondary level education were the only ones to have a non-significant increase in mean score possibly being attributed to the fact that they marked only a small amount (4.6%) of the sample population. Currently, there is little research that looked into the correlation between self-care and level of schooling other than Mekonen and Demissie (2022) which found that those with primary level education scored three times less than those with tertiary level education.

Similar to what was implied by Alsaleh et al. (2021), Senussi, Lincoln and Jeffcoate have found in 2011 that the NAFF score means were statistically different in those people who had foot problems (both current and previously had) with higher scores being earned by those who never had experienced foot problems in the diabetic population. This study did not differentiate the sample based on the presence of foot complications however the mean score was well above the 50-mark suggesting the local older adult population has good levels of foot-related self-care practices. This can be explained by the fact that the vast majority attend podiatry clinics on a

regular basis and would have already received routine advice and education on how to care for their current foot problem or general foot health.

This positive outcome is the result of the increased focus on health education and screening services. This is further solidified by a study in India which found significantly more self-care knowledge and practices in people in more developed countries. It also states that males were most likely to have lower foot care knowledge and practices due to them being breadwinners and thus not prioritising their health before their income (George et al., 2013). A systematic review was performed to identify the effect of foot educational strategies on self-care knowledge and practice in people living with end-stage kidney disease. Although the sample population was open from 18 years and above, it was found that education strategies have improved knowledge, practices and most importantly, the reduced frequency of foot-related complications (Alshammari et al., 2022). In a similar study on patients on haemodialysis, it was suggested that improvements in mean scores of foot-related self-care (measured with NAFF) could have been caused by the simple administration of the questionnaire rather than directly from any particular educational programmes. An additional observation has been made that during and after the study more individuals have been directly requesting for foot-related assessments signifying the increased foot-care awareness (Brand et al., 2016).

A pilot study was conducted in the United States on the self-management of older adults without diabetes and constructed a 4-week educational program that vastly improved the knowledge and behaviours of foot self-care. However, it was also argued that certain items within NAFF were not relatable to their sample population such as the use of radiators to keep their feet warm (O'Connor et al., 2020). some similar comments were also made during the data collection process of this study. Of the questionnaire, all items were easily understood by the participants, however, some items' relevance was brought into question. Item 9 asked about the frequency of nail trimming with the lowest score given if less than once a month. For most older adults they would be unable to trim their own nails and would require podiatric intervention. Furthermore, in primary healthcare, the service could not accommodate routine nail trimming appointments every month (unless at immediate high risk).

5.2.1. Factors affecting self-care behaviour

Miikkola et al., (2019) divided the challenges faced by older individuals into 3 categories, physical, external and internal. An example of physical changes that limit self-care include nail and skin structure. Due to the thickening of skin and nails and the fact that some people get stiff and gain weight with age, limits their ability to inspect and care for them on their own safely without risking injury. In the same study, they stated that some people view care from a professional as a sort of commodity and not as an essential part of their healthcare (Miikkola et al., 2019). Furthermore, seasonal changes played an important role, especially in the choice of footwear, hosiery and use of emollient. Familial and social support also played a factor. In the above study, some found it difficult to ask family members for help for certain activities but in this current study, it was mentioned that certain participants especially spouses found it uncomfortable or were afraid to offer help even for simple nail filing.

It was described that foot-related self-care incorporated the following actions; nail cutting, hygiene, moisturising, massaging, exercising, use of foot file, hosiery and shoes (Miikkola et al., 2019). The basic limitation to all these actions is visual impairments and more importantly physical limitations, specifically the lack of flexibility that permits the aging adult to see and reach their feet making it difficult for simple inspection to be possible. At this point, it is argued that seeking help also constitutes as self-care but is dependent on the level of pain and discomfort experienced and their sense of urgency (McPherson, Carroll & Stewart, 2022).

The NAFF contains certain items about the use of hosiery moisturizer and type of footwear. In some cases, the responses given to these items are dependent on the current weather. An example is the increased tendency to wear flip-flops in summer than in winter. Use of moisturizers increases more during drier weather with some individuals requiring more during colder weather. This study did not measure the impact of personality traits on self-care but it was deducted that motivation and laziness have opposing effects on a person's self-care practices. They are results of feelings towards oneself, level of past experience and warnings given by relevant health care professionals (Hill, Ellis & Gillison, 2022).

5.3. Comparing Total FHSQ Scores

The overall FHSQ score for the study group was obtained by adding all the scores, with higher scores reflecting better foot health status. The Likert scale scores for certain items were inverted so that a lower score would indicate poor foot health status and high scores indicate optimal foot health. The lowest possible score was 29 while the highest being 125 indicating the poorest and best foot health status respectively. Similarly to the NAFF, there is no clear-cut guideline on what constitutes a poor level of foot health status but one could compare obtained scores to both the maximum and minimum possible scores. In a study conducted by López et al., (2016) the overall FHSQ score was not taken into account but the tool was separated into different domains that relate to certain groups of items; Foot Pain, Foot Function, General Foot Health and Footwear while excluding General Health, Physical Activity, Social Capacity and Vigor. Some researchers have chosen to consider only the first section (first 4 Domains) of the FHSQ for their statistical analysis. For this study, however, all 8 domains of the FHSQ were deemed relevant to answer the research questions (Landorf & Keenan, 2002). All of these domains have been assessed separately.

In this study within the whole population, there was a significant decrease in mean Total FHSQ scores from T_0 (103.385) to T_3 (97.284) however still being considered adequate in both phases. This could reflect the presence of other issues of specific foot health or general health that podiatric intervention and education could not address on its own. As stated by the Spearman coefficient test, this result is deemed to be unrelated to the scores obtained with the NAFF meaning there is no correlation between foot-related self-care and foot quality of life.

Age, Gender and Educational Level

No significant differences between all factors, gender, age and educational level were found in this study. Between visits to the clinic, each separate age group scored less mean total FHSQ scores. The total mean score at both T_0 and T_3 seemed to have a gradual decline with the increase in age (106.27, 10.2.17 and 99.28 at T_0 and 101.36, 96.17 and 89.94 at T_3). Similarly, males and females have scored progressively lower means scores at T_0 and T_3. Females scored lower overall means than males (104.50 and 102.57 at T1 and 99.39 and 95.75 at T_3) which have implications backed up by research even though insignificant from this result (López-López et al., 2018). No significant

difference was noted in all educational levels. The highest scoring group was that of post-secondary level education however it should be noted that this group is also the smallest from the overall sample.

The above results could be attributed to the unavoidable progression of senescence and increased physical limitation. Furthermore, the advancements in medical treatments along with polypharmacy could pose a factor in maintaining and current foot health (Algahtani, 2023). Additionally, a positive outlook on their own self improves their view and as a result scores in 3 domains; General Foot Health, General Health and Social Capacity. Muchna et al., (2018), also found the overall frailty level of older adults and the impact of the prevalence of foot problems and overall foot health (Muchna et al., 2018).

5.4. Relationship between NAFF and Total FHSQ scores

The Spearman correlation deduced that within this sample there is no existing relationship between the results obtained from both questionnaires. At first glance, this implies that there is no relation between foot-related self-care practices and foot health. However, one needs to look carefully at the nature of the items of both questionnaires. The Naff contains items that target the frequency of simple tasks such as visual inspection, washing and drying, trimming of nails, use of moisturizers and more that although important for foot health are not directly related to the items within the FHSQ. Domains of the FHSQ as stated within the previous chapters include Foot Pain, Foot Function, Physical Activity and more. Even if the participants obtained perfect scores within the NAFF, it would not necessarily equate to perfect FHSQ scores since the items are not directly related to each other. Furthermore, even if the chief complaint of the patient is resolved by podiatric intervention, it would not necessarily improve the overall foot pain, function and physical capabilities of the patient. This is due to the fact that certain physical limitations and conditions are not for the podiatrist to treat alone, especially if the patient lives with longstanding or systemic conditions such as diabetes and arthritis.

5.5. Comparing Foot Pain Score

The 4 items of this domain asked about the severity (in the week prior) and frequency of foot pain with a total minimum and maximum score of 4 and 20 respectively. As seen in the results, there was no significant difference between visits to the podiatric clinic.

Age

All age groups scored favourable means and did not exhibit any significant differences in their scores. This indicates that on average they did not experience high severity or frequency of pain during the prior week (which did not change upon subsequent reviews). People aged 75-84 experienced marginally the lowest mean scores at both T_0 (16.34) and T_3 (16.20) signifying that they experienced the most pain (intensity and frequency) than the other groups. This contradicts results obtained from other studies which stated that podiatric interventions had positive effects on foot pain scores. However, it should be considered that such studies aimed to tackle a particular foot problem or the effectiveness of a certain treatment modality, whereas for the purpose of this study, the nature of foot pain was irrelevant as it encompassed overall quality of life (van der Zwaard et al., 2014). A study by Menz et al., (2011) divided participants into age groups, differently than in this study: >50, 51-60, 61-70 and 71< with more. They reported that age was an associated factor with foot pain that specifically persisted every day for a 1-month duration which resulted in functional limitation. The FHSQ on the other hand limited this definition for duration to 1 week prior.

Gender

Both males and females had optimal scores with no significant differences noted. Females similarly exhibit slightly more foot pain than males at T_0 and T_3 however exhibited an increase in the mean score at T_3 whereas males exhibited a decline in pain score (Canca-Sanchez et al., 2024). This is in accordance with other studies that identified the female gender as a predisposing factor to foot pain at specific anatomical regions. Further cementing this claim is the fact that females are more likely to have a more proactive approach to their own self-care and seek medical advice than men similar to their mean NAFF scores improved much more than males (Petrie et al., 2022). Similar results were obtained were females exhibited significantly higher levels of foot pain than

males resulting in a lower quality of life (López-López et al., 2018). Thomas et al., (2011) added that females were more predisposed to foot pain with the common sites being digits and forefoot with 2/3rds of cases leading to reduced foot function.

Educational Level

Mean foot pain level did not differ significantly between the educational level groups. Similar to the total FHSQ score, those in post-secondary education exhibited the highest mean score at T_0 (19.40) but in contrast scored the lowest at T_3 (14.83). There is little research on the association between level of education and foot pain and this study did not find an association between foot pain and educational level. The above study noted more prevalent foot pain in those with higher levels of education implying that educational level did not equal protective and preventive measures taken (Hendry et al., 2018).

An additional predictor of foot pain was the presence of foot deformities. Using the FHSQ for digital deformities such as hallux valgus, it was studied and found patients experience greater levels of foot pain, with more levels of pain felt depending on the severity of the deformity itself (López et al., 2016).

5.6. Comparing Foot Function Scores

Similar to the previous domain, the Foot function included 4 items from the FHSQ with similar minimum and maximum scores of 4 and 20 respectively. The questions were similar in nature, asking about the frequency and severity of limitations (on performing tasks, walking and climbing stairs) caused by the foot to one week prior to the appointment. In all age, gender and educational level groups, there were no significant changes between T_0 and T_3 after visits to the podiatric clinic but with a slight decline in mean scores. The mean scores obtained in both T_0 were deemed adequate with some unfavourable decrease by T_3 albeit insignificant

Age

The mean scores did not alter significantly between visits to the podiatrist with a slight decline in means scores noted for all groups. According to the results obtained, the 75-84 age group exhibited

the most limitations in foot function than the others at T_0. However, those aged 85< exhibited the greatest reduction in mean scores by T_3 (13.44) implying the effects of senescence at a later age. Although not significant it complements the known literature that describes limitations in foot function in the older population as being associated with the level of balance, especially with the presence of pain (Menz & Lord, 2001). Foot pain does not limit its effect on foot function alone, but also in other physical activities and social integration. Components of foot function considered were biomechanical in nature such as ankle dorsiflexion, reaction time, digital flexor strength and gait (Mickle et al., 2011). As age increases, these characteristics are more important as predictive factors for both new and recurrent incidences of falls (Awale et al., 2018)

Gender

The results of this study however noted no significant difference between males and females after visits to the podiatrist. Furthermore, the results show that females exhibited more foot function than males in the first encounter than males but were also those that progressed worse throughout the year of study (13.00 and 13.89 respectively). This finding is complemented by another study which found similar results when comparing males and females using the FHSQ (López-López et al., 2018). A similar explanation can be provided to that of the Foot Pain domain were females are more predisposed to foot pain (e.g. due to deformities) and as a result, decreased foot function (Canca-Sanchez et al., 2024).

Educational Level

In all educational groups foot function did not vary significantly with similar means scores by the end of the year of study. The effects of educational level on foot health have not been investigated and there is no current research to support or offer a plausible explanation for the result obtained.

The reasoning behind foot function score lies similar and dependent on the presence and severity of foot pain. These two domains were found to be positively correlated in different studies with pain being a precursor to lower foot function. As stated in the Foot Pain domain the presence of deformities is a predisposing factor to foot pain and by associated with more foot limitation as found by López-López et al., (2018) with mean scores of 71.37 with the presence of lesser toe deformities and 84.38 without.

5.7. Comparing General Foot Health Scores

This domain consisted of only 2 items that targeted how the person personally viewed their foot health, with a minimum possible score of 2 and maximum possible score of 10. It should be noted that since it is subjective some people viewed and answered these items from different perspectives; some participants opted to view positive general as the absence of deformities, wounds and pain. On the other hand, some chose to consider the question of whether or not their feet cause physical limitations. Each category scores very similar score slightly above the median mark of this domain (6) indicating that although not fantastic, people consider their foot health as being adequate. Results show that there were no significant differences in mean scores between visits to the podiatrist.

Age

This study showed that the most affected were those of 75-84 and 85< age groups with their means being reduced the most. This coincides with different studies that suggest that with age their perception of general foot health is lower. It should be noted that such studies compared the impact of certain deformities such as hallux valgus or other lesser toe deformities (López et al., 2016). In this study, structural deformities were not taken into account but could have played a role in the results obtained since as stated by López et al., (2016) the severity of the deformity has a greater negative impact on people of more advanced age.

Gender

Although marginally, females have been affected more with a reduction of mean scores which could be attributed to the fact that females tend to take more care of themselves. This finding goes hand in hand with what was stated before that females are more generally conscious about their health, especially about their feet. Results were similar in a study conducted in Saudi Arabia stating also that women are more conscious about their foot appearance resulting even in a lower quality of life when compared to men (Almaawi et al., 2023).

Educational Level

Considering that all educational groups scored similar at T_0, those of primary educational level

had their score diminished the most by T_3. However, no studies have evaluated the differences and relevance of educational level on self-perception of general health, especially in the older population.

5.8. Comparing Footwear Scores

This 3-item domain targeted the difficulty one felt in selecting and buying footwear that is comfortable to wear (minimum score of 3 and maximum score of 15). The results of this domain suggest that older adults on average did not find it difficult to find footwear with adequate fit and support, however, this does not mean that what they picked and bought was ideal for their foot structure and condition. Unfortunately, many have expressed difficulties since they felt the market does not cater to those that require more accommodative styles. Furthermore, some prioritised fashion over comfort. Many people tend not to change their preferred footwear after only one year and this is the main reason why the responses remained very similar throughout (Menz et al., 2017).

Age, Gender and Educational Level

In this study, there was very minimal change of all means scores across age, gender and educational level groups between T_0 and T_3. Similarly, Almaawi et al. (2023), also found statistical This is mainly because people do not tend to buy footwear that regularly especially since they commonly wear the same footwear for a duration of more than the suggested 1 year. On the other hand, changes were noted by females whereas they scored lower due to the probability of them wanting more fashion-oriented footwear even at an advanced age. However, many have expressed that their priority was to wear footwear that comforts them for everyday use.

5.9. Comparing General Health Scores

The domain involved only 1 item asked only on the rating of their general health. The Likert scale only measured very good, good and poor (score 1-3). Many studies that used FHSQ opted not to include this domain for their statistical analysis. Similar to the General Foot Health domain, the results show average scores between all categories indicating that on average older adults consider

themselves to be relatively healthy considering their age, physical limitations and presence of comorbidities.

Age

People from all age groups had similar mean scores however, only those aged 65-74 have improved their scores marginally while both other groups had a marginal decline in their mean scores.

Gender and Educational Level

Both gender and educational level groups scored similar means with little to no difference between T_0 and T_3 except for those of post-secondary educational level groups which have seen marginally more decline (2.40 at T_0 to 1.83 at T_3).

It was suggested that people respond to this item partly depending on other comorbidities and polypharmacy that a person might present with which in older age is not uncommon (Almaawi et al., 2023). Being subjective in nature, how people responded to this item lies also within their personality traits. Traits such as neuroticism, extraversion, openness to experience, agreeableness and conscientiousness which can change during old adulthood are correlated to their general view of themselves and even their utilization of healthcare (Friedman et al., 2013).

5.10. Comparing Physical Activity Scores

The domain of the FHSQ consisted of 9 items that asked about certain tasks the individual could perform ranging from errands to simple day-to-day actions such as showering or climbing stairs. The person would be asked to state to which extent he/she is limited if at all (total minimum score of 9 and maximum score of 27). Overall, the population scored favourable scores in all categories (well above the median mark) however this section of the FHSQ is where the most decline in mean scores was noted in all age and gender groups and two of the educational levels groups.

Age

In all age groups, there is a significant reduction in their physical capabilities with the lowest mean score attributed to those aged 85<. Furthermore, that age group was affected most during the 1

year with significantly the biggest decline in mean score by T_3 (from 19.84 to 15.50). As stated in previous domains, there is a positive correlation between the increase in age and an increase in physical limitations such as lack of balance, flexibility and altered gait which limit most if not all the items within the Physical Activity domain (Menz & Lord, 2001).

Gender

Females scored significantly less and scored lower than males in this study which could be attributed to the cultural influence that females tend to perform most of the home care that were mentioned in the domain. Another reason could be due to their predominance of increased foot pain and decreased foot function which thus limit them further in certain aspects of everyday tasks listed (Almaawi et al., 2023).

Educational Level

Primary and secondary schooling are the only ones that are affected significantly with Post-Secondary and Tertiary having only marginal differences possibly due to the lower numbers in the sample. Again, there are no relevant studies that investigated the effects of levels of schooling on the physical capabilities of older adults thus no supporting information is present.

5.11. Comparing Social Capacity Scores

This 2-item domain asked whether the person's individual physical and emotional health hindered their ability to participate in social activities (interacting with friends, family, etc.). The score ranged from a minimum of 2 to a maximum of 10. Scores obtained from this study show that the older population is secure and comfortable with their social skills and capabilities with friends and families

Age, Gender, Educational Level

In this study, there seemed to be little difference in scores between phases for each of the age groups, gender and educational levels but overall, all groups had favourable scores of social functions. This study did not assess in detail the mental health of the participants however patients with depression comprised 8.3% of the sample. It is important to recognise such mental health

disorders as it negatively impacts social integration outside their home. Depression is still very common in regions across Europe with approximately 15% under treatment (Copeland et al., 2004). It was discussed that older adults have an increased predisposition to sensations of social isolation and loneliness with the recent COVID-19 pandemic with its obligatory restrictions such observations only exacerbating the symptoms and increasing the frequency (Donovan & Blazer, 2020). However, in this study, there isn't any indication that the population was influenced greatly by such a phenomenon. Even though not part of the research aims, this could be due to the various ways to keep in contact with friends and family, especially on a relatively small island such as Malta.

It should be noted that the level of social integration is also dependent on cultural environment and family situation with additional factors such as religion and good social networking having contributing roles. If such conditions are optimised, it would benefit people, especially older adults to overcome sensations of isolation and reduce symptoms of depression and anxiety. It is important to keep social status into consideration due to its detrimental effects on disease onset and progression (Institute of Medicine (US) Committee on Assessing Interactions Among Social, Behavioral, and Genetic Factors in Health, 2006).

5.12. Comparing Vigor Scores

The final domain is Vigor which targeted the individual's personal energy and enthusiasm levels during the 4 weeks prior ranging from scores 4-20. Similar to foot pain and function domains, since the time between periods was typically more than the 4 weeks mentioned, the answer might not be entirely reflective of the general state but only a specific short period. The average scores obtained from people indicate that there are signs of tiredness and lack of livelihood within the sample.

Age

Understandably, those aged 85< scored the lowest mean scores when compared to the other age groups with marginally declining at T_3 (11.67-10.67). The difference exhibited by age group 65-84 was the only one recorded that was statistically significant (13.28-12.00).

Gender

Similar to what was stated above, females are affected relatively more than males by senescence which is shown by their mean scores in this domain which were marginally worse than males at both T_0 and T_3. This finding is backed up again by Almaawi et al. (2023), who found mean Vigor scores significantly lower in females than males.

Educational Level

There were no significant differences between each educational group with primary, secondary and post-secondary exhibiting a small decline in their mean scores while those of tertiary-level education fluctuated only slightly. Currently, there is no supporting evidence to correlate the level of education with energy level.

Furthermore, the answer given was greatly affected by the current weather as well. During the data protection process participants were eager to mention that they felt more tired during the harsher times of summer due to increased temperatures. These statements are supported by the study conducted by Aspvik et al. (2018), which also found older adults are less likely to perform physical activities if the current weather is unpleasant. However, it was also stated that this depends on their current fitness as older adults who were considered in good physical shape did not consider weather as being a barrier.

5.13. Implications of Results

The research question sought to determine whether podiatric intervention had an impact on self-care practices and the foot health status of older adults living independently in the community.

The findings suggest that baseline levels of self-care practices of the sample population were optimal which were further impacted positively by visits to the podiatrist. Routine one-to-one education provided during visits to the podiatric clinic on proper foot self-care has been shown to improve the willingness of people to make better decisions regarding their feet during their daily routine. The NAFF was used to determine the level of foot-related self-care practices that older adults perform between 3 follow-up reviews over one year. It was determined that people have

made significant improvements towards foot self-care after visits to the podiatrist, except those of advanced age (85<) where only marginal improvements were seen. This could have been attributed to the advanced limitations and frailty that come with ageing which the NAFF does not screen for or assess. This study also found similar significant improvements in both genders and levels of schooling. These findings further highlight the importance of the role of the podiatrist and routine education and screening in these specific elderly populations not only for the presenting complaint of the patient but the holistic foot to try to keep these older adults as active as possible and on their feet.

The FHSQ was used to measure the difference in overall foot health status and quality of life in older adults to determine whether routine podiatric management impacted their foot care and quality of life. The results of this study show that overall older adults have positive levels of quality of life however there was a significant decline throughout the interval visits to the podiatrist. These results imply that routine podiatric intervention does not positively impact the foot health status of an older individual, and does not counteract the effect of ageing on the foot quality of life of an older adult. The FHSQ does not go into depth on the polypharmacy, and other diagnoses that the participants may have that are not directly correlated to foot health, which could however impact certain answers given to some of the domains such as General Health, Physical activity, social capacity and Vigor. Thus, it is important that when assessing an older adult, the full medical history and collaboration with other medical practitioners are fundamental to improving the overall quality of life of the patient as a whole. Podiatrists should not limit themselves to treating foot conditions alone, but should also be able to recognise certain red flags that may cause hindrance to patients' well-being and ability to self-care. By being the first point-of-care for foot health and by working within a multi-disciplinary team, the podiatrist can refer to other professionals who can aid in the management of certain conditions that cannot be handled by a podiatrist alone.

5.14. Limitations of this Study

Regardless of the nature of a research design and the results obtained; it is unavoidable that a study possesses certain weaknesses that could influence the outcomes and the conclusion inferred (Ross & Zaidi, 2019). However, it is still recommended to account for certain factors as too many

limitations will inevitably affect the validity of the results obtained.

It is within the best interest of the researcher to showcase such limitations and their potential influence on the results so as to indicate certain opportunities for future research or expansion of the presented knowledge. Furthermore, certain biases that can provide similar detrimental effects should also be mentioned so that could be removed in future studies (Greener, 2018).

5.14.1. Sample Size

Due to the nature of the study, the sampling method and the inclusion criteria, it was not difficult to recruit the desired number of participants in this study. However, it was difficult to recruit an equal number of participants in the different age categories. The probability of encountering patients of age 85 and above in a primary healthcare setting is lower thus the recruitment of this age group of elderly subjects was limited. This could be attributed to the fact that this population is frailer and more reliant on family members or other means for transportation to the podiatry clinics in health centre. An additional reason could be that there are currently more outreach services within Community Care that can accommodate them closer to or in their homes. Nevertheless, it would be recommended that should this study be repeated, a larger sample size be considered to be able to have more opportunities to recruit more participants from this specific age group.

5.14.2. Response Bias and Retention

The questionnaires used were provided to each participant to fill in on their own, with the researcher present in case of any difficulty encountered. Due to the nature of the questionnaire, even though pseudonymity was ensured, some respondents might have answered in such a way as to please the researcher or the clinician. Unfortunately, the presence of this bias could not be confirmed.

5.14.3. Recruitment Period

That recruitment phase for Data collection took place between June and early December of the same year. This means that some patients were contacted in early summer while others were in late autumn. Seasonal differences could have impacted their responses in some of the questions of the NAFF (such as the type of footwear worn, hosiery and time walking barefoot) and FHSQ (feeling tired or having a lot of energy) which influence the overall score. Thus, it is suggested that if this study is to be repeated or expanded upon the recruitment of participants be within the same season.

5.14.4. Comorbidities

This study recruited patients regardless of their current comorbidities to gain a more open view of the older adult population. Statistical analysis also did not focus on comorbidities as it was not deemed directly necessary to answer the research question. However, it is very possible that certain comorbidities affected the level of foot health and self-care practices. Thus, it would be beneficial to assess those with significant comorbidities separately and compare the differences between them and those relatively healthy older adults.

5.14.5. Cohesiveness of the questionnaires

Both tools were chosen due to their positive validity and reliability, however, when considering the items within the tools, it could be apparent that they do not influence each other as evident via the Spearman Rank Coefficient. Since the items and how they are presented do not interact or share common ground between tools, they might not be ideal to be used together.

5.14.6. COVID-19 Pandemic

This study commenced during the COVID-19 pandemic which affected the number of people that attended health centres. Furthermore, more vulnerable people were encouraged not to leave their homes unless necessary which could be an additional reason as to why there were few participants

of the age group 85< recruited in the study.

5.15. Recommendations for Practice

The findings of this study have positive implications for routine podiatric practice in this specific population. While it has been found that patients do tend to learn from the one-to-one education given during routine consultations, standardised educational material or programs could be implemented to further enhance positive outcomes in all geriatric patients. Such educational material should provide a summary of the basic ways to take care of one's own feet. In some cases, due to physical limitations by age people might feel discouraged to follow the advice on routine foot care, thus some alternative methods should be explained for tasks such as applying emollient or wearing socks to enable patients to comply with the advice given.

It is important that, in order to educate or teach a person, one should be able to communicate effectively, thus it is advised that healthcare professionals (podiatrists in this case) should undergo periodical refresher training. This should be done with the aim of being able to educate a greater variety of patients and be able to help them with any queries and not simply treat their presenting foot pathology. Due to the nature and topic of this study, it is imperative to encourage the ageing population to take a step forward in taking care of themselves to reduce the impact of senescence.

Being that quality of life is multifactorial in nature, the podiatrist alone cannot necessarily be able to improve and maintain it alone. The presence of other pathologies or conditions can influence foot-specific quality of life; thus, it is necessary to adopt and improve upon a multi-disciplinary approach. This will aid all patients specifically older adults in ways to self-care in other aspects of their health and not their feet alone.

5.16. Recommendations for Future Research

As previously stated, the larger the sample size used for a study the more accurately the results represent the given population. In this study, participants were not equally recruited between groups concerning age categories. Thus, it is suggested that if this study were to be repeated or

adapted, a bigger sample size would be gathered with a greater number of people aged 85 and above.

As also implied in the limitations, a selection of a better pair of tools that complement each other more would provide more favourable results and associations between foot-related self-care and foot health status.

Since patient education is a key component in addressing the aims and objectives of this study, it is recommended that future research should aim to develop effective educational strategies to improve foot-related self-care knowledge in the ageing population.

Furthermore, the vast majority of participants recruited were majorly ones that have already had podiatric consultations on a routine basis. This means that they would have already been one-to-one educated on self-care at some point. Thus, it would be beneficial to repeat this study with patients who use the service for the first time in order to evaluate the true effect of podiatric intervention on self-care practices and knowledge. Having the participants divided and analysed according to their significant comorbidities would also provide insight into how patients adapt lifestyle and foot care with respect to their current medical conditions.

CHAPTER 6
CONCLUSION

The aim of this study was to determine the impact of podiatric consultation on the level of foot self-care practices in older adults living independently in the community. To determine this, 2 tools were utilized; Nottingham Assessment of Function Footcare (NAFF) which was used to score the level of foot-related self-care practices performed, and the Foot Health Status Questionnaire (FHSQ) to evaluate the foot health status of the participants during the study period. The participants recruited were assessed and categorized by age, gender and level of schooling which according to the literature could impact the level of self-care. All participants were approached on their due appointment time at Podiatric clinics and asked to fill in the aforementioned questionnaires (at Time0). Participants were followed up 3 more times at 4-month intervals to identify any significant differences in their responses.

The findings of this study suggest that podiatric consultation and intervention improved the level of foot-related self-care practices as observed by the significant increase in mean NAFF scores from the baseline scores throughout the year of the study. Conversely, foot-related quality of life has been noted to significantly decrease throughout the year. This signifies that podiatric intervention plays an important role in encouraging patients to be more proactive concerning their foot health. However podiatric intervention alone is not enough to improve foot-related quality of life within the independent-living older adult population. Through additional statistical analysis, it was found that those aged 85< were less likely to take care of their own feet compared to those of other age groups due to decreased physical flexibility and capabilities and also general energy levels.

This study reinforces the idea that self-care education is an important tool in any medical

profession with positive effects. Thus, it is recommended that health care professionals always take a holistic approach towards every patient and not simply address their presenting complaint alone but always considering their overall lifestyle by providing relevant advice for their betterment. Considering the overall quality of life, every podiatrist must remain the first point of care when it comes to foot health while working in a multi-disciplinary setting and refer whenever it benefits the presenting patient. It is recommended that educational material for foot care should be shared with patients, including giving general information to new cases or those presenting with certain foot conditions. Education and self-care are key factors in the prevention of diseases and conditions that would otherwise lead to pain, discomfort and disability.

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APPENDIX 1

L-Università ta' Malta

Participants` Consent Form

An evaluation of the Podiatric intervention with regards to foot-self practices amongst the independent ageing population living in the community

I, the undersigned, give my consent to take part in the study conducted by Simon Camilleri The purpose of this document is to specify the terms of my participation in this research study.

1. I have been given written and verbal information about the purpose of the study and all questions have been answered.
2. I understand that I have been invited to participate in a study, in which the researcher will ask questions to identify any significant differences in foot health status and self-care practices after visits to the Podiatry Clinic in the elderly population who live independently.
3. I am aware that the meeting will take approximately 45 minutes. I understand that the meeting is to be conducted when I am scheduled at the podiatric clinic.
4. I am aware that my responses will be written on prepared questionnaires.
5. I am aware that the data collected will be coded and that this data will be stored securely and separately from any codes and personal data.
6. I am aware that the researcher is the only person who has access to this data. The academic supervisor/s and examiners will typically have access to coded data only. There may be exceptional circumstances which allow the supervisor and examiners to have access to personal data too, for verification purposes.
7. I am also aware that the data files will be stored on the researcher's personal computer that is password protected and in an encrypted format. Any material in hard-copy form will be placed in a locked cupboard and kept until results are published.
8. I am aware that my identity and personal information will not be revealed in any publications, reports or presentations arising from this research.
9. I also understand that I am free to accept, refuse or stop participation at any time without giving any reason. This will have no negative repercussions on myself and that any data collected from me will be erased as long as this is technically possible (for example, before it is anonymised or published), unless erasure of data would render impossible or seriously impair achievement of the research objectives, in which case it shall be retained in an anonymised form.
10. I understand that there are no foreseeable risks associated with participation in this study.

11. I also understand that my contribution will serve to better education regarding foot self-care in the elderly**.** I understand that there will not be any direct benefits for me at that point in time.
12. I understand that under the General Data Protection Regulation (GDPR) and national legislation that implements and further specifies the relevant provisions of said regulation, I have the right to access, rectify, and where applicable ask for the data concerning me to be erased.
13. I also understand that once the study is completed and results are published, the data will be retained in anonymous form. Any personal details will be destroyed.
14. I will be provided with a copy of the information letter and consent form for future reference.
15. I have read and understood the points and statements of this form. I have had all the questions answered to my satisfaction, and I agree to participate in this study.

Participant: _____

Signature: _____

Date: _____

Name of Research Supervisor:

Prof. Cynthia Formosa

Email Address:

cynthia.formosa@um.edu.mt

Tel: 2340 1838

Name of Researcher:

Mr. Simon Camilleri

Email Address:

simon.camilleri.13@um.edu.mt

Tel: 79430518

Signature: 

Date: 24.02.2022.

Signature: 

Date: 24.02.2022

APPENDIX 2

L-Università ta' Malta

Formula ta' Kunsens tal-Partečipanti

An evaluation of the Podiatric service with regards to foot-self practices amongst healthy ageing population living in the community.

Jien, hawn taħt iffirmat/a, nagħti l-kunsens tiegħi biex nieħu sehem fl-istudju mmexxi minn Simon Camilleri. L-għan ta' dan id-dokument hu li jiġu speċifikati t-termini tal-partečipazjoni tiegħi f'dan l-istudju ta' riċerka.

1. Jien ingħatajt informazzjoni miktuba u verbali dwar l-għan tal-istudju u l-mistoqsijiet kollha twieġbu.
2. Nifhem li se nkun qed nipparteċipa fi studju, fejn ir-Riċerkatur ħa jinvestiga l-impatt tas-servizz tal-podjatrija fuq il-kura personali tas-sieq.
3. Naf li l-istudju se jieħu madwar 45 minuta. Nifhem, li l-laqgħa se ssir meta nkun skedat/a għal-klinika tal-podjatrija.
4. Jien konxju/a li r-risposti tiegħi se jkunu jinkitbu fuq kwestonarji preparati.
5. Naf ukoll li se ssir kodifikazzjoni tad-data u din se tinżamm separatament mill-informazzjoni personali.
6. Naf ukoll li r-Riċerkatur hu l-uniku persuna li se jkollu aċċess għal din l-informazzjoni, filwaqt li s-Superviżura akkademikua (jew is-Superviżuri akkademiċi) u l-eżaminaturi se jkollhom aċċess għal data kkodifikata biss. Is-Superviżuri akkademiċi u l-eżaminaturi jista jkollhom bżonn aċċess għall-informazzjoni miġbura għal skop ta' verifika.
7. Barra min hekk, naf li d-data se jinħażnu fuq il-kompjuter personali tar-Riċerkatur jew Riċerkatriċi permezz ta' kodifikazzjoni tad-data (data encryption) u li hi protetta b'password. Barra minn hekk, naf li l-materjal stampat se jitqiegħed f'post sikur u se jinżamm sakemm joħorġu r-riżultati.
8. Naf li l-identità tiegħi u l-informazzjoni personali mhuma se jinkixfu mkien fit-teżi, fir-rapporti, fil-preżentazzjonijiet u/jew fil-pubblikazzjonijiet li jistgħu jirriżultaw minnha.
9. Nifhem ukoll li jien liberu/a li naċċetta, nirrifjuta jew inwaqqaf il-partečipazzjoni f'kull ħin bla ma nagħti raġuni. Dan mhux ħa jkollu riperkussjonijiet negattivi fuqi. Nifhem ukoll li la darba nirtira minn dan l-istudju, l-informazzjoni miġbura se titħassar sakemm mhux teknikament possibbli (per eżempju, qabel tiġi anonimizzata jew pubblikata), sakemm tħassir tad-data jagħmel impossibbli jew serjament tfixkel il-kisba tal-għanjiet tar-riċerka, f'dak il-kas se tkun inżamma f'forma ananomizzata.
10. Nifhem li ma hemm ebda riskju prevedibbli relatat mal-partečipazzjoni f'dan is-studju.

11. Nifhem ukoll li l-kontribuzzjoni tiegħi ser isservi biex tissaħħaħ l-edukazzjoni dwar il-kura personali tas-sieq u kwalita tas-servizz għal-anzjani. Nifhem li mhux ser ikun hemm benefiċċji diretti għalija f'dak il-ħin u mument.
12. Nifhem ukoll, li skont ir-Regolamenti Ġenerali dwar il-Protezzjoni tad-Data (GDPR) u l-leġiżlazzjoni nazzjonali li timplimenta u tispeċifika aktar il-provvedimenti relevanti tar-regolamenti msemmija, jiena għandi d-dritt li naċċessa, nirretifika, u fejn japplika nitlob sabiex titħassar id-data li tikkonċernani.
13. Naf ukoll li meta jintemm l-istudju u r-riżultati jkunu ppubblikati, id-data se tinżamm b'mod anonimu. L-informazzjoni personali miġbura se tiġi mħassra.
14. Fl-aħħar nett, naf ukoll li se ningħata kopja tal-ittra ta' informazzjoni u tal-formula ta' kunsens sabiex inkun nista' naċċessahom fil-futur.
15. Jien qrajt u fhimt il-punti u d-dikjarazzjonijiet f'din il-formula. Inħossni sodisfatt/a bit-tweġibiet li ngħatajt għall-mistoqsijiet li kelli, u qed naċċetta minn jeddi li nipparteċipa f'dan l-istudju.

Parteċipant:_____

Firma:_____

Data:_____

Isem is-Superviżura tar-riċerka:

Prof. Cynthia Formosa

Indirizz tal-email:

cynthia.formosa@um.edu.mt

Tel: 2340 1838

Firma:

Data: 24.2.2022

Isem ir-Riċerkatur:

Mr. Simon Camilleri

Indirizz tal-email:

simon.camilleri.13@um.edu.mt

Tel: 79430518

Firma:

Data: 24.2.2022

APPENDIX 3

L-Università ta' Malta

Participants` Information Sheet

Dear Participant,

My name is Simon Camilleri and I am currently reading for a M.Sc.(Hons.) Podiatry degree at the University of Malta. As part of my course requirements I am conducting a research study entitled, "An evaluation of the Podiatric intervention with regards to foot-self practices amongst the independent ageing population living in the community".

The aim of this study is to identify any significant differences in foot health status and self-care practices after visits to the Podiatry Clinic in the elderly population who live independently. There will be no direct benefits to you, however your participation in this study would help us gain a better understanding about how to improve education and quality of podiatric service to the elderly. Furthermore, all data collected from this research shall be used solely for the purpose of this study.

You are being invited to participate in a study which will investigate your foot health status and foot self-care score. If you agree to participate, you will meet the researcher four times during this study at the Podiatry Clinic at your local Health Centre, for approximately 45 minutes each time. If you choose to participate, you are requested to contact the researcher by telephone using the number found at the end of this document so as to schedule the first appointment.

During the visit you will be:

1. asked some general questions about you, such as your age, educational, medical history, and further questions about your foot health status and foot self care practices in the form of questionnaires during the first appointment,
2. receiving asked treatment for your feet as required
3. answering the questionnaires at 3 more times at 3 month intervals

Data will be stored pseudonymously. I can assure you that confidentiality will be maintained throughout the study and that your identity and personal information will not be revealed in any publications, reports or presentations arising from this research. All data collected will be pseudonymised meaning that the data will be assigned codes and that this data will be stored securely and separately from any codes and personal data.

This data may only be accessed by the researcher. The academic supervisor/s and the examiners will typically have access to coded data only. There may be exceptional circumstances which allow the supervisor and examiners to have access to personal data too, for verification purposes. The coded data files will be stored on the researcher's personal computer that is password protected and in an encrypted format. Any material in hard-copy form will be placed in a locked cupboard.

Participation in this study is completely voluntary and you are free to accept or refuse to take part without giving a reason and without any repercussions on the service you receive and any data collected will be erased. A copy of the information sheet and consent form will be provided for future reference. As a participant, you have the right, under the General Data Protection Regulation (GDPR) and national legislation that implements and further specifies the relevant provisions of said regulation, to access, rectify and where applicable ask for the data concerning you to be erased. There are no foreseeable risks associated with participation in this study. Once the study is completed and the results are published, the data will be retained in anonymous form. Any personal details and other data gathered will be destroyed in May 2024 after submission of the study. Refusal or withdrawal from the study will not cause no repercussions on the service and benefits to which you are entitled to. Any data gathered prior to withdrawal will also be destroyed as long as this is technically possible (for example, before it is anonymised or published), unless erasure of data would render impossible or seriously impair achievement of the research objectives, in which case it shall be retained in an anonymised form.

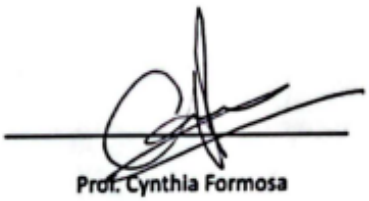
This study has been approved by the Research Ethics Committee of the Faculty of Health Sciences at the University of Malta.

Thank you for your time and consideration. Should you have any questions or concerns do not hesitate to contact me on 79430518 or by email on simon.camilleri.13@um.edu.mt my supervisor Prof Cynthia Formosa on 2340 1838 or by sending an email on cynthia.formosa@um.edu.mt.

Yours Sincerely,

Simon Camilleri

Researcher



Prof. Cynthia Formosa

Research Supervisor

APPENDIX 4

L-Università ta' Malta

Formula ta' Informazzjoni għall-Parteċipanti

Għażiż/a Parteċipant/a,

Jiena Simon Camilleri, fil-preżent qed insegwi kors tal-Masters mal-Universita ta Malta. Bħala parti mir-rekwiżiti tal-kors, qed nagħmel riċerka bit-titlu, "An evaluation of the Podiatric intervention with regards to foot-self practices amongst the independent ageing population living in the community".

L-għan ta' dan l-istudju hu li ninvestiga l-impatt tas-servizz tal-podjatrija fuq il kura personali tas-saqajn fil-popolazzjoni anzjana li jgħixu independenti. Mhux ser ikun hemm benefiċċji diretti għalik, pero is-sehem tiegħek f'dan l-istudju jista' jgħin biex ikollna aktar għarfien dwar kif nistaw ntejjbu l-edukazzjoni u kwalita tas-servizz għal-anzjani. Kull informazzjoni miġbura tintuża biss għall-għan jew l-għanijiet ta' dan l-istudju.

Bħala parteċipant/a inti se tintalab tieħu sehem f'dan l-istudju sabiex ninvestigaw l-impatt tas-servizz tal-podjatrija fuq il-kura personali tas-sieq. Jekk taċċetta li tieħu sehem inti tintalab sabiex tiltaqa' mar-riċerkatur Simon Camilleri għal erba' darbiet matul dan is-studju, fil-klinika tal-podjatrija fiċ-ċentru tas-saħħa jew f'post u f'ħin li jkun konvenjenti għalik. Din il-laqgħa se tieħu madwar 45 minuti. Jekk tkun se tagħżel li taċċetta tieħu sehem inti mitlub li tikkuntattja lir-riċerkatur b'mezz ta telefonata li n-numru jinsab fl-aħħar ta' dan id-dokument biex isir l-ewwel appuntament.

Waqt din iż-żjara, inti se tkun:

1. mistoqsi xi mistoqsijiet ġenerali dwarek, inkluż l-età' tiegħek, livell edukattiv, storja medika u xi mistoqsijiet dwar is-saħħa tiegħek u l-kura personali tiegħek fil-forma ta kwestjunarji.
2. se tirċievi it-trattament tas-sieq li tirrekjedi
3. mistoqsi biex twieġeb il-kwestjunarji għal tlett darbiet oħra b'intervall ta' 3 xhur bejniethom

Id-data se tinħażen b'mod pseudonimu kemm-il darba jkun impossibbli li titħassar (eż. jekk diġà kienet pseudonimizzata). Nassigurak li se tinżamm il-kunfidenzjalità matul l-istudju kollu u l-identità tiegħek u kull informazzjoni personali miġbura mhuma se jiġu żvelati mkien fit-teżi,

ir-rapporti, il-preżentazzjonijiet u/jew il-pubblikazzjonijiet li jistgħu jirriżultaw minnha. Kull tagħrif miġbur se jiġi psewdonomizzat, jiġifieri id-data kollha se tkun protetta permezz ta' sistema ta' kodiċi u miżmuma separatament mill-informazzjoni personali.

Ir-Riċerkatur biss ser ikollu aċċess għall-informazzjoni miġbura, filwaqt li s-Superviżura akkademika (jew is-Superviżuri akkademiċi) u l-eżaminaturi se jkollhom biss aċċess għal data kkodifikata. Is-Superviżuri akkademiċi u l-eżaminaturi jista jkollhom bżonn aċċess għall-informazzjoni miġbura għal skop ta' verifika.

Id-data kollha se jinħażnu fuq il-kompjuter personali tar-Riċerkatur permezz ta' kodifikazzjoni tad-data (data encryption) u li hi protetta b'password. Barra minn hekk, il-materjal stampat se jinqafel f'post sigur.

Il-parteċipazzjoni tiegħek f'dan l-istudju hija għażla għal kollox volontarja u inti ħieles/ħielsa li taċċetta jew tirrifjuta li tieħu sehem mingħajr ma jkun hemm konsegwenzi fil-konfront tiegħek u s-servizz li tingħatalek u l-informazzjoni li tingħabar mingħandek titħassar. Se tingħata kopja tal-ittra ta' informazzjoni u tal-formula ta' kunsens sabiex tkun tista' taċċessahom fil-futur. Barra minn hekk, skont ir-Regolamenti Ġenerali dwar il-Protezzjoni tad-Data (GDPR) u l-leġiżlazzjoni nazzjonali li timplimenta u tispeċifika aktar il-provvedimenti relevanti tar-regolamenti msemmija, inti għandek id-dritt li taċċessa, tirretifika, u fejn japplika titlob sabiex titħassar id-data li tikkonċerna lilek. Ma hemm ebda riskju prevedibbli relatat mal-parteċipazzjoni f'dan is-studju. L-informazzjoni personali u data kollha miġbura se titħassar hekk kif jintemm dan l-istudju ta' riċerka u jkunu ppubblikati r-riżultati miksuba f'Mejju 2024. Rifjut jew irtirar min dan is-studju mhux se jikkawża ebda riperkussjonijiet fuq is-servizz jew benefiċċji li inti tkun intitotal/a għalihom. Kull data miġbur qabel l-irtirar se titħassar ukoll sakemm mhux teknikament possibbli (per eżempju, qabel tiġi anonimizzata jew pubblikata), sakemm tħassir tad-data jagħmel impossibbli jew serjament tfixkel il-kisba tal-għanjiet tar-riċerka, f'dak il-kas se tkun inżamma f'forma ananomizzata.

Dan l-istudju ġie approvat mill-Kumitat għall-Etika fir-Riċerka fi ħdan il-Fakultà tax-Xjenzi tas-Saħħa fl-Università ta' Malta.

Grazzi ħafna tal-ħin u s-sehem tiegħek f'dan l-istudju. F'każ li jkollok xi mistoqsijiet jew tixtieq tiċċara xi ħaġa, tista' ċċempilli fuq 79430518 jew tibgħatli email fuq simon.camilleri.13@um.edu.mt jew lis-Superviżura Prof. Cynthia Formosa fuq 2340 1838 jew billi tibgħat email fuq cynthia.formosa@um.edu.mt. Jekk taċċetta biex tieħu sehem f'dan is-studju

Dejjem tiegħek,

Mr. Simon Camilleri

Isem ir-Riċerkatur

Prof. Cynthia Formosa

Isem is-Superviżura

APPENDIX 5

Data Collection Sheet

Index Number _____

Gender _____ **Age** _____

Level of Education _____

Medication _____

_____

_____

Smoking History _____

_____

Podiatric Intervention _____

_____

_____

APPENDIX 6

Nottingham Assessment of Functional Footcare Revised 2015

We would like to know what you do to look after your feet. Please tick the category which best reflects what you actually do. Please answer every question. Thank you.

1. Do you examine your feet?
More than once a day 3 Once a day 2 2-6 times a week 1 Once a week or less 0

2. Do you check your shoes before you put them on?
Often 3 Sometimes 2 Rarely 1 Never 0

3. Do you check your shoes when you take them off?
Often 3 Sometimes 2 Rarely 1 Never 0

4. Do you wash your feet?
More than once a day 3 Once a day 2 Most days a week 1 A few days a week 0

5. Do you check your feet are dry after washing?
Often 3 Sometimes 2 Rarely 1 Never 0

6. Do you dry between your toes?
Always 3 Often 2 Sometimes 1 Rarely/Never 0

7. Do you use moisturising cream on your feet?
Daily 3 Once a week 2 About once a month 1 Never 0

8. Do you put moisturising cream between your toes?
Daily 0 About once a week 1 About once a month 2 Never 3

9. Are your toenails cut?
About once a week 3 About once a month 2 Less than once a month 1 Never 0

10. Do you wear slippers with no fastening?
Most of the time 0 Sometimes 1 Rarely 2 Never 3

11. Do you wear trainers?
Most of the time 3 Sometimes 2 Rarely 1 Never 0

12. Do you wear shoes with lace-up, Velcro or strap fastenings?
Most of the time 3 Sometimes 2 Rarely 1 Never 0

13. Do you wear pointed-toed shoes?

1

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Most of the time 0 Sometimes 1 Rarely 2 Never 3

14. Do you wear flip-flops or mules?
Most of the time 0 Sometimes 1 Rarely 2 Never 3

15. Do you break in new shoes gradually?
Always 3 Most of the time 2 Sometimes 1 Rarely /Never 0

16. Do you wear artificial fibre (e.g. nylon) socks?
Most of the time 0 Sometimes 1 Rarely 2 Never 3

17. Do you wear shoes without socks/stockings/tights?
Never 3 Rarely 2 Sometimes 1 Often 0

18. Do you change your socks/stockings/tights?
More than once a day 3 Daily 2 4-6 times a week 1 Less than 4 times a week 0

19. Do you walk around the house in bare feet?
Often 0 Sometimes 1 Rarely 2 Never 3

20. Do you walk outside in bare feet?
Often 0 Sometimes 1 Rarely 2 Never 3

21. Do you use a hot water bottle in bed?
Often 0 Sometimes 1 Rarely 2 Never 3

22. Do you put your feet near the fire?
Often 0 Sometimes 1 Rarely 2 Never 3

23. Do you put your feet on a radiator?
Often 0 Sometimes 1 Rarely 2 Never 3

24. Do you use corn remedies/corn plasters/ paints when you get a corn?
Never 3 Rarely 2 Sometimes 1 Often 0

25. Do you put a dry dressing on a blister when you get one?
Never 0 Rarely 1 Sometimes 2 Often 3

26. Do you put a dry dressing on a graze, cut or burn when you get one?
Never 0 Rarely 1 Sometimes 2 Often 3

Thank you for completing this questionnaire

APPENDIX 7

L-Università ta' Malta

Nottingham Assessment of Functional Footcare Revised 2015

Nixtiequ nkunu nafu x'tagħmel biex tieħu ħsieb saqajk. Jekk jogħġbok immarka l-kategorija li l-aħjar tirrefletti fil-fatt x'tagħmel. Jekk jogħġbok wieġeb kull mistoqsija. Grazzi.

1. Teżamina saqajk?
Iktar min darba f'jum 3 darba f'jum 2 2-6 darbiet fil-ġimgħa 1 darba fil-ġimgħa jew inqas 0

2. Tiċċekkja ż-żraben tiegħek qabel tilbishom?
Spiss 3 Kultant 2 Rari 1 Qatt 0

3. Tiċċekkja ż-żraben tiegħek meta tneżżagħhom?
Spiss 3 Kultant 2 Rari 1 Qatt 0

4. Taħsilhom saqajk?
Iktar min darba f'jum 3 darba f'jum 2 ħafna ġranet fil-ġimgħa 1 ftit ġranet fil-ġimgħa 0

5. Tiċċekkja saqajk wara li tinħasel?
Spiss 3 Kultant 2 Rari 1 Qatt 0

6. Tixxutthom sew bejn is-swaba ta' saqajk?
Dejjem 3 Spiss 2 Kultant 1 Rari/Qatt 0

7. Tuża ingwent għal-kontra ġilda xotta fuq saqajk?
Kuljum 3 Once a week 2 Qisu darba fix-xahar 1 Qatt 0

8. Titfa ingwent għal-kontra ġilda xotta bejn is-swaba ta saqajk?
Kuljum 0 Qisu darba fil-ġimgħa 1 Qisu darba fix-xahar 2 Qatt 3

9. Id-dwiefer ta saqajk maqtugħin?
Qisu darba fil-ġimgħa 3 Qisu darba fix-xahar 2 Inqas minn darba fix-xahar 1 Qatt 0

10. Tilbes papoċċ mingħajr mod ta qfil?
ħafna drabi 0 Kultant 1 Rari 2 Qatt 3

11. Tilbes trejners?
ħafna drabi 3 Kultant 2 Rari 1 Qatt 0

1

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12. Tilbes żraben bi qfil ta lazz, Velcro jew ċinga?
ħafna drabi 3 Kultant 2 Rari 1 Qatt 0

13. Tilbeż żraben ippuntati mas-swaba?
ħafna drabi 0 Kultant 1 Rari 2 Qatt 3

14. Tilbes flip-flops jew żraben tal-bgħula?
ħafna drabi 0 Kultant 1 Rari 2 Qatt 3

15. Iżżanżan żraben ġodda gradwalment?
Dejjem 3 ħafna drabi 2 Kultant 1 Rari /Qatt 0

16. Tilbes kalzetti b'fibra artifiċjali (bħal nylon)?
ħafna drabi 0 Kultant 1 Rari 2 Qatt 3

17. Tilbes iż-żraben mingħajr kalzetti/tajts?
Qatt 3 Rari 2 Kultant 1 Spiss 0

18. Tbiddel il-kalzetti/tajts?
Iktar min darba f'jum 3 Kuljum 2 4-6 darbiet fil-ġimgħa 1 Inqas minn 4 darbiet fil-ġimgħa 0

19. Timxi ġewwa d-dar ħafi?
Spiss 0 Kultant 1 Rari 2 Qatt 3

20. Timxi barra ħafi?
Spiss 0 Kultant 1 Rari 2 Qatt 3

21. Tuża flixkun tal-mishun fis-sodda?
Spiss 0 Kultant 1 Rari 2 Qatt 3

22. Titfa saqajk viċin in-nar?
Spiss 0 Kultant 1 Rari 2 Qatt 3

23. Titfa saqajk fuq radjatur?
Spiss 0 Kultant 1 Rari 2 Qatt 3

24. Tuża remedji/ġibs/żebgħa meta jkollok kallu?
Qatt 3 Rari 2 Kultant 1 Spiss 0

25. Tuża faxxa mingħajr medikatura fuq bużżieqa meta titrabbilek?
Qatt 0 Rari 1 Kultant 2 Spiss 3

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26. Titfa faxxa mingħajr medikatura fuq barxa, qata' jew ħruq meta jkollok?

Qatt 0 Rari 1 Kultant 2 Spiss 3

Grazzi ta li imlejt dan il-kwestjunarju

APPENDIX 8

L-Università ta' Malta

Thank you for taking the time to fill out this important questionnaire. The answers you provide will help your podiatrist to understand how to care for your foot problems. The questionnaire is very simple to complete and there are no right or wrong answers. The questionnaire takes less than 10 minutes to complete.

The Foot Health Status Questionnaire Version 1.04 Version

INSTRUCTIONS

- This questionnaire asks for your views about your foot health.
- All you need to do is circle your answer to each question.
- If you are unsure about how to answer a question, please give the best answer you can.

1. What level of foot pain have you had during the past week ?

None.....1
Very Mild..... 2
Mild..... 3
Moderate..... 4
Severe..... 5
(circle number)

	Never	Occasionally	Fairly Many Times	Very Often	Always
2. How often have you had foot pain?	1	2	3	4	5
3. How often did your feet ache?	1	2	3	4	5
4. How often did you get sharp pains in your feet ?	1	2	3	4	5

The following questions are about the foot pain you have had during the past week.

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These questions are about how much your feet interfere with activities you might do during a typical day. (circle a number for each question below)

DURING THE LAST WEEK.....

	Not at All	Slightly	Moderately	Quite a bit	Extremely
5. Have your feet caused you to have difficulties in your work or activities ?	1	2	3	4	5
6. Were you limited in the kind of work you could do because of your feet ?	1	2	3	4	5

DURING THE LAST WEEK...

	Not at All	Slightly	Moderately	Quite a bit	Extremely
7. How much does your foot health limit your walking ?	1	2	3	4	5
8. How much does your foot health limit you climbing stairs ?	1	2	3	4	5

9. How would you rate your overall foot health ? *(circle number)*

Excellent..... 1
Very Good..... 2
Good..... 3
Fair..... 4
Poor..... 5

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The following questions are about the shoes that you wear. Please circle the response which best describes your situation.

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
10. It is hard to find shoes that do not hurt my feet.	1	2	3	4	5
11. I have difficulty in finding shoes that fit my feet.	1	2	3	4	5
12. I am limited in the number of shoes I can wear.	1	2	3	4	5

13. In general, what condition would you say your feet are in ? *(circle number)*
Excellent..... 1
Very Good..... 2
Good..... 3
Fair..... 4
Poor..... 5

Please write some comments about the current state of your feet:
.....
.....
.....
.....
.....

14. In general, how would you rate your health : *(circle number)*
Very Good..... 1
Fair..... 2
Poor..... 3

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15. The following questions ask about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much? *(circle a number on each line)*

ACTIVITIES	Yes, Limited A Lot	Yes, Limited A Little	No, Not Limited At All
a. Vigorous activities, such as running, lifting heavy objects, or (if you wanted to) your ability to participate in strenuous exercise	1	2	3
b. Moderate activities, such as cleaning the house, lifting a chair, playing golf or swimming	1	2	3
c. Lifting or carrying bags of shopping	1	2	3
d. Climbing a steep hill	1	2	3
e. Climbing one flight of stairs	1	2	3
f. Getting up from a sitting position	1	2	3
g. Walking more than a kilometre	1	2	3
h. Walking one hundred meters	1	2	3
i. Showering or dressing yourself	1	2	3

16. This next question asks to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours or social groups? *(circle number)*

Not at all..... 1
Slightly..... 2
Moderately..... 3
Quite a bit..... 4
Extremely..... 5

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17. These questions are about how you "feel" and how things have been with you during the past month. For each question, please give the one answer that comes closest to the way you have been "feeling". How much of the time during the past 4 weeks:

	All of the time	Most of the Time	Some of the Time	A little of the Time	None of the Time
a. Did you feel tired?	1	2	3	4	5
b. Did you have a lot of energy?	1	2	3	4	5
c. Did you feel worn out?	1	2	3	4	5
d. Did you feel full of life?	1	2	3	4	5

18.During the past 4 weeks, how much of the time has your emotional problems or physical health interfered with your social activities (like visiting with friends, relatives, etc.)? *(circle number)*

No time at all..... 1
A small amount of time..... 2
Moderate amount of time..... 3
Quite a bit of the time..... 4
All of the time..... 5

19. How TRUE or FALSE is each of the following statements for you? *(circle a number on each line)*

	True or Mostly True	Don't Know	False or Mostly False
a. I seem to get sick a little easier than other people	1	2	3
b. I am as healthy as anybody I know	1	2	3
c. I expect my health to get worse	1	2	3
d. My health is excellent	1	2	3

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Please complete the following details.

Sex: Male ❑ Female ❑

23. What is the date when you filled out this survey? Please write here → _____

24. Do you currently take any medicine prescribed by your doctor for any of the following conditions ; (please tick the appropriate box/s)

Diabetes ❑	Hormone Replacement Therapy ❑
Osteoarthritis ❑	High Cholesterol ❑
Blood Pressure ❑	Rheumatoid Arthritis ❑
Heart Disease ❑	Back Pain ❑
Lung Disease ❑	Depression ❑

Any other conditions you take medicine for, please list .....
1.
2.
3.

For the next questions, please tick either YES or NO

	Yes	No
26. Do you smoke cigarettes ?	❑	❑
27. Do you do any regular physical exercise ?	❑	❑

Thank you for completing this questionnaire

Appendix 9

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Nirringrazzjak ta li qed tieħu mil-ħin tiegħek biex timla dan il-kwestjunarju importanti. Ir-risposti li tipprovdi se jgħinnu lil podjatra tiegħek biex jifhem kif għandu jieħu ħsieb il-problemi ta saqajk. Dan il-kwestjunarju huwa sempliċi ħafna biex titlesta u m'hemm ebda risposta tajba jew ħażina. Dan il kwestjunarju jieħu inqas min 10 minuti biex titlesta.

The Foot Health Status Questionnaire Version 1.04 Version

ISTRUZZJONIJIET

- Dan il-kwestjunarju isaqsi fuq il-fehmiet tiegħek dwar is-saħħa ta' saqajk.
- Kull ma trid tagħmel huwa tiċċirkolha t-tweġiba tiegħek għal-kull mistoqsija.
- Jekk m'intix ċert/a dwar kif tirrispondi mistoqsija, jekk jogħġbok agħti l-aħjar gweġiba li tista'.

1. X'livell ta uġigħ fis-sieq kellek matul l-aħħar ġimgħa?

Ebda.....1
Ħafif ħafna.....2
Ħafif.....3
Moderat.....4
Severa..... 5
(iċċirkula n-numru)

	Qatt	Xi Kultant	Pjuttost Ħafna Drabi	Ħafna Spiss	Dejjem
2. Kemm il-darba kellek uġigħ f'sieqek?	1	2	3	4	5
3. Kemm il-darba weġawk saqajk?	1	2	3	4	5
4. Kemm il darba kellek uġigħ qawwi f'saqajk?	1	2	3	4	5

Il-mistoqsijiet li ġejjin huma madwar l-uġigħ tas-saqajn li kellek matul l-aħħar ġimgħa.

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Dawn il-mistoqsijiet huma fuq kemm dan l-uġigħ jinterferixxi fl-attivitajiet li tista' tagħmel matul ġurnata tipika. (ċċirkula numru għal kull mistoqsija hawn taħt)

MATUL L-AĦĦAR ĠIMGĦA.....

	Anqas Xejn	Kemmxejn	Moderat	Pjuttost Ftit	Estremament
5. Saqajk ikkawżawlek diffikultajiet fix-xogħol jew attivitajiet tiegħek?	1	2	3	4	5
6. Kont limitat/a fit-tip ta xogħol li stajt tagħmel minħabba saqajk?	1	2	3	4	5

MATUL L-AĦĦAR ĠIMGĦA...

	Anqas Xejn	Kemmxejn	Moderat	Pjuttost Ftit	Estremament
7. Kemm tillimitak is-saħħa ta sieqek waqt il-mixi?	1	2	3	4	5
8. Kemm tillimitak is-saħħa ta sieqek waqt li titla t-taraġ?	1	2	3	4	5

9. Kif tirrata s-saħħa ġenerali ta saqajk? *(ċċirkula numru)*

Eċċellenti.....1
Tajjeb Ħafna..... 2
Tajjeb.....3
Ġust..... 4
Fqir..... 5

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Il-mistoqsijiet li ġejjin humwa dwar iż-żraben li tilbes. Jekk jogħġbok iċċirkula r-risposta li l-aħjar tiddiskrivi is-sitwazzjoni tiegħek.

	Naqbel Ħafna	Naqbel	La Naqbel u anqas Ma Naqbilx	Ma Naqbilx	Ma Naqbilx Ħafna
10. Diffiċli biex insib żarbun li ma jweġġawlix saqajja.	1	2	3	4	5
11. Insibha diffiċli insib żraben li jiġuni saqajja fihom.	1	2	3	4	5
12.Jiena limitat/a fl-ammont ta żraben li nista' nilbes.	1	2	3	4	5

13. Inġenerali, f'liema kundizzjoni tista' tgħid li huma saqajk? *(ċċirkula numru)*
Eċċellenti.....1
Tajjeb Ħafna.....2
Tajjeb.....3
Ġust.....4
Fqir.....5

Jekk jogħġbok ikteb xi kummenti dwar is-stat ta' saqajk:
.....
.....
.....
.....
.....

14. Inġenerali, kif tirrata saħħtek?: *(iċċirkula numru)*
Tajjeb Ħafna.....1
Ġust.....2
Fqir.....3

L-Università ta' Malta

15. Il-mistoqsijiet li ġejjin isaqsu dwar l-attivitajiet li jaf tagħmel matul ġurnata tipika. Is-saħħa tiegħek issa tillimitak f'dawn l-attivitajiet? Jekk iva, b'kemm? *(iċċirkula numru fuq kull linja)*

ATTIVITAJIET	Iva, Limitat/a Ħafna	Iva, Limitat/a Ftit	Le, Mhux Limitat/a Xejn
a. Attivitajiet vigoruż, bħal ġiri, irfigħ ta oġġetti tqal, jew (jekk ridt) l-abilita biex tipparteċipa f'eżerċizzju ta strapazz	1	2	3
b. Attivitajiet moderati, bħa; tniddif tad-dar, irfigħ ta' siġġu, Moderate activities, such as cleaning the house, lifting a chair, tilgħab golf jew għawm	1	2	3
c. Irfigħ jew ġarr ta' basktijiet tax-xiri	1	2	3
d. Tela' ta' għoljiet weqfin	1	2	3
e. Tela' ta tarġa	1	2	3
f. Tqum min bilqiegħda	1	2	3
g. Mixi ta iktar min kilometru	1	2	3
h. Mixi ta iktar min mitt metru	1	2	3
i. Doċċa jew tintlibes	1	2	3

16. Din il-mistoqsija ssaqsi għal-liema estent is-saħħa fiżika jew problemi emozzjonali interferixxu mal-attivitajiet soċjali normali mal-familja, ħbieb, ġirien jew gruppi soċjali? *(iċċirkula numru)*

AnqasXejn.....1
Kemmxejn.....2
Moderat..... 3
Pjuttost.....4
Estremament.....5

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17. Dawn il-mistoqsijiet huma dwar kif 'tħossok' u kif kienu l-affarijiet miegħek matul l-aħħar xahar. Għal kull mistoqsija, jekk jogħġbok agħti r-risposta li tiġi l-eqreb għal kif kont qed tħossok. Kemm il-darba matul l-aħħar 4 ġimgħat:

	Il-Ħin Kollu	Ħafna mil-Ħin	Parti mil-Ħin	Ftit Tal-Ħin	Ebda Ħin
a. Ħassejtek għajjien	1	2	3	4	5
b. Kellek ħafna enerġija?	1	2	3	4	5
c. Ħassejtek mikdud?	1	2	3	4	5
d. Ħassejtek mimli bil-ħajja?	1	2	3	4	5

18.Matul l-aħħa 4 ġimgħat, kemm mil-ħin interferixxu il porblemi emozzjonali jew saħħa fiżika fl-attivitajiet soċjali (bħal żjarat mal-ħbieb, qraba, etc.)? *(iċċirkula numru)*

L-ebda ħin..... 1
Ammont żgħir tal-ħin..... 2
Ammont moderat tal-ħin..... 3
Pjuttost ftit tal-ħin..... 4
Il-ħin kollu..... 5

19. Kemm hu VERU jew FALZ kull dikjarazzjoni għalik? *(iċċirkula numru fuq kull linja)*

	Veru jew Biċċa kbira Veru	Ma Nafx	Falz jew Biċċa kbira Falz
a. Nidher li nimrad ftit iktar faċli min nies oħra	1	2	3
b. Jien b'saħħti daqs kwalunkwe persuna li naf	1	2	3
c. Jien nistenna saħħti tmur għal-agħar	1	2	3
d. Saħħti eċċellenti	1	2	3

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Jekk jogħġbok imla d-dettalji li ġejjin.

Sess: Maskil ❑ Femminil ❑

23. Meta kienet id-data meta imlejt dan is-stħarriġ? Jekk jogħġbok ikteb hawn → _____

24. Bħalissa tieħu mediċina preskritt mit-tabib tiegħek għal xi xi tip min dawn il-kundizzjonijiet; (jekk jogħġbok immarka il-kaxxa/i appropjati)

Dijabete ❑	Terapija ta' sostituzzjoni tal-ormoni ❑
Osteoartrite ❑	Kolesterol Għoli ❑
Pressjoni ❑	Artrite tar-Rheumatiżmu ❑
Mard tal-Qalb ❑	Uġigħ tad-Dahar ❑
Mard tal-Pulmun ❑	Depressjoni ❑

Xi Tip ieħor ta kundizzjoni li tieħu medikazzjoni għaliha, jekk jogħġbok niżżel .....
1.
2.
3.

Għal-mistoqsijiet li ġejjin, jekk jogħġbok immarka IVA jew LE

	Iva	Le
26. Tpejjep sigarretti ?	❑	❑
27. Tagħmel xi eżerċizzju fiżiku regolari ?	❑	❑

Grazzi talli lestejt dan il-kwestjunarju

Appendix 10

Primary HealthCare

FRN 1940

Website: http://www.health.gov.mt

PRIMARY HEALTHCARE

7 Harper Lane,
Floriana
FRN 1940

Telephone: + 356 21239993
Telefax: + 356 21222856

9 July 2022

Simon Camilleri
43, Triq il-Kappar
Attard,
ATD 2283

Re: Your request to carry out a study within the Primary Health Department

Dear Mr Camilleri,

I am pleased to inform you that your request to carry out the research within the department has been **fully approved**.
May I inform you that as we have to abide to the Data Protection Law, **we cannot provide you with a list of data subjects' (clients/patients/staff) personal contact details**.* The data subjects also have to sign an informed consent form that also includes a data protection statement (unless it is an anonymous questionnaire) prior to participating (see E below). Any modifications of this approach would have to be first discussed with the data protection officer. Where statistics are involved, only data in terms of age, sex etc can be forwarded to you but not names of individuals.

May I bring to your attention that the researcher is obliged to apply necessary safeguards as a condition for carrying out this research, namely -

A. The personal data (of data subjects) accessed or given are only to be used for that specific purpose to conduct the research and for no other purpose;

B. At the end of the research, all personal data should be destroyed;

C. All references to personal data should be omitted in the report unless an informed consent is specifically obtained from the person being identified in the research report;

D. Participation in the research being conducted should be at the discretion of the individual, and they can refuse any participation whatsoever if they so wish;

E. If data subjects (patients/staff) are going to be interviewed, video recorded or given a non-anonymous questionnaire to fill, an informed consent form should be signed by the participating data subject and a privacy policy statement read to them; Faces should be hidden or digitally modified as to conceal identity;

F. Any other measure deemed fit by the respective Head, depending on the research to be carried out.

I sincerely wish you every success in your studies.

Yours truly,

Dr Mario Vella, Data Protection Officer, Primary HealthCare

**May I suggest that you offer the invitation for participation through any officer in charge (e.g. Nursing officer/Senior GP/service provider)*

Appendix 11

Simon Camilleri
43, Triq il-Kappar
Attard, ATD 2283

Dear, Mr. Andrew Scicluna,

My name is Simon Camilleri and I am a student at the Faculty of Health Sciences at the University of Malta leading to a M.Sc.(Melit) Podiatry degree. I am in the process of submitting my research proposal to the Faculty Research Ethics Committee for approval to conduct this study.

The title of my research is: "An evaluation of the Podiatric intervention with regards to foot-self practices amongst the independent ageing population living in the community". This study is being supervised by Professor Cynthia Formosa. As part of this research I intend to use 2 structured questionnaires named The Foot Health Status Questionnaire and Nottingham Assessment of Function Footcare which will measure the foot health status and self care practices respectively. These tools will be used after the patient has been treated. These tools will be applied on 3 additional reviews in order to identify differences in the answers obtained. This method will help to gain insight on the impact of podiatric service on education and self care practices in the ageing population.

The inclusion criteria for this study are listed below:

- Patients aged 65 and above.
- Make use of podiatry service at primary health care for the first time (New Cases)
- Live independently (not in nursing or long term facilities)

I am hereby seeking your permission as the Professional Lead of Podiatry in Malta to recruit participants and perform my study in podiatry clinics at Hal Qormi, Floriana and Mosta Health Centres.

Eligible participants will be approached primarily by an intermediary who will provide the Information sheet and Consent form. Participation will be entirely voluntary and participants will be free to withdraw at any point without any repercussions. All data will be kept strictly confidential. Personal data will be stored in a password protected computer accessible only to the primary researcher. An index number (numerical code) will be given to each participant at the beginning of the study so that the personal data will be pseudonymised. All information related to participants will be kept pseudonymous and only the supervisor and I will have access to data.

Should you require further information, please do not hesitate to contact me or my supervisor; both our contact details are provided below.

Thank you for your kind consideration of this request.

Sincerely,

Simon Camilleri
Email: simon.camilleri.13@um.edu.mt
Tel:79430518

Supervisor: Prof. Cynthia Formosa
Email: cynthia.formosa@um.edu.mt
Tel: 23401838

Andrew Scicluna
Name
Andrew Scicluna
Professional Lead
Podiatry Department

Signature

19th January 2022
Date

Appendix 12

Approved for all clinics

Mrs. Yvonne Midolo

Simon Camilleri
43, Triq il-Kappar
Attard, ATD 2283

Dear Mrs. Yvonne Midolo,

My name is Simon Camilleri and I am a student at the Faculty of Health Sciences at the University of Malta leading to a M.Sc.(Melit) Podiatry degree. I am in the process of submitting my research proposal to the Faculty Research Ethics Committee for approval to conduct this study.

The title of my research is: "An evaluation of the Podiatric intervention with regards to foot-self practices amongst the independent ageing population living in the community". This study is being supervised by Professor Cynthia Formosa. As part of this research I intend to use 2 structured questionnaires named The Foot Health Status Questionnaire and Nottingham Assessment of Function Footcare which will measure the foot health status and self care practices respectively. These tools will be used after the patient has been treated. These tools will be applied on 3 additional reviews in order to identify differences in the answers obtained. This method will help to gain insight on the impact of podiatric service on education and self care practices in the ageing population.

The inclusion criteria for this study are listed below:

- Patients aged 65 and above.
- Live independently (not in nursing or long term facilities)

I am hereby seeking your permission to act as intermediary for my study in order to recruit participants from Birkirkara, Paola and Mosta Health Centres. As the intermediary I would require you to provide the participants with an information letter and notify them that if they choose to take part in the study, they should contact me within approximately 1 week (using the details provided in the letter) in order to schedule our first appointment.

Participation will be entirely voluntary and participants will be free to withdraw at any point without any repercussions. All data will be kept strictly confidential. Personal data will be stored in a password protected computer accessible only to the primary researcher. An index number (numerical code) will be given to each participant at the beginning of the study so that the personal data will be pseudonymised. All information related to participants will be kept pseudonymous and only the supervisor and I will have access to data.

Should you require further information, please do not hesitate to contact me or my supervisor; both our contact details are provided below.

Thank you for your kind consideration of this request.

Sincerely,

Simon Camilleri
Email: simon.camilleri.13@um.edu.mt
Tel:79430518

Supervisor: Prof. Cynthia Formosa
Email: cynthia.formosa@um.edu.mt
Tel: 23401838

_____	_____	_____
Name	Signature	Date