

DEVELOPMENT OF GUIDELINES IN HOME MODIFICATION PRACTICE FOR OCCUPATIONAL THERAPISTS

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ABSTRACT

Home modification practices are integral interventions within occupational therapy, aiming to optimize living environments for individuals with diverse needs. A comprehensive understanding of these interventions is crucial for progress and refining current practices. Recent studies have underscored this necessity and proposed solutions to enhance the efficacy of home modification practices. Foster (2019) emphasized the importance of comprehensively understanding the current state of home modification practices to identify gaps and inform future research and interventions. The focus of this study was to develop tailored guidelines for home modification practices for occupational therapists in Qatar. These guidelines aimed to establish consistent protocols for managing patients referred for home modification. Additionally, the study assessed the current home modification practices of Occupational Therapists in Qatar and evaluated the satisfaction levels of clients or their families with these practices. The proposed guidelines were developed to address identified shortcomings in current practices, and their acceptability among occupational therapists in Qatar was evaluated. Ultimately, the study aimed to establish a baseline dataset informing future research, practice, and policy development in home modification practices in Qatar. By documenting current practices, satisfaction levels, and proposed guidelines, the research aimed to contribute to ongoing efforts to enhance the quality, accessibility, and inclusivity of occupational therapy services in Qatar. Findings revealed that most therapists in Qatar do not use standardized step-by-step guidelines for home assessment, despite expressing a desire for such guidelines. Additionally, there is a lack of involvement in research or follow-up studies regarding home modification practices among Occupational Therapists in Qatar. However, clients and families expressed high satisfaction levels with current home modification practices, attributed to factors such as recommendations, therapist involvement, collaboration, and safety measures. The proposed step-by-step guidelines offer a comprehensive framework for occupational therapists, prioritizing evidence-based practice and professional standards to enhance service quality in Qatar. The guidelines advocate for client-centered care and collaboration in decision-making, aiming to improve satisfaction and outcomes. Feedback from occupational therapists regarding the proposed guidelines was generally positive, indicating a high level of acceptance and satisfaction with the suggested framework for guiding their practice in home modification interventions. This study is considered a valuable resource for developing comprehensive home modification practice guidelines for occupational therapists.

Keywords: Home modification practices, Occupational therapy, Guidelines, Satisfaction levels

INTRODUCTION

Navigating the intricate landscape of home modification practices, occupational therapists wield invaluable expertise in tailoring living spaces to meet the diverse needs of their clients. However, amidst the myriad approaches employed, a critical need emerges for standardized guidelines to streamline and enhance the efficacy of these interventions. Zingaro, (2019) emphasizes the importance of tailored home modifications to enhance accessibility and usability, particularly for older adults and individuals with disabilities. Home modification practices are essential interventions in occupational therapy that aim to optimize living environments for individuals with diverse needs. To make progress and refine current practices, it is crucial to have a thorough understanding of these interventions. Recent studies have emphasized this need and proposed solutions for enhancing the efficacy of home modification practices. Foster, (2019) highlighted the importance of comprehensively understanding the current state of home modification practices to identify gaps and inform future research and interventions.

Meanwhile, Mortenson, (2019) found that clients' satisfaction with home modifications is influenced by various factors, including the quality of the modifications, the extent of involvement in the decision-making process, and the impact on their independence and well-being. Similarly, a study by Liu, (2020) explored the satisfaction levels of older adults who received home modifications and found that modifications that addressed safety concerns and improved accessibility were highly valued. In addition, a study by Stark, (2017) highlighted the importance of assessing clients' satisfaction with home modifications to inform future interventions and enhance the effectiveness of occupational therapy practices. By delving into the current practices of occupational therapists and assessing the satisfaction levels of clients and their families, Gitlin, (2021) proposed a framework for home modification interventions that emphasizes a person-centered approach, taking into account individual preferences, goals, and needs. Similarly, a study by Krieger, (2023) explored home modifications and found that it could improve clients' satisfaction and well-being. To enhance the effectiveness of home modification interventions, Clark and Lysack, (2022) emphasized the importance of evidence-based guidelines and standardized assessment tools in home modification practices, with a focus on improving efficacy and prioritizing client-centered care.

Considering thereof research study conducted by Lindsay et al., (2024) indicates that there are promising practices, policies, and interventions to improve accessible housing through methods such as home modifications, smart homes, mobile applications, and experimental devices. These strategies have the potential to enhance the quality of life for people with disabilities. As occupational therapists strive to achieve consistency and effectiveness in home modification practices, guidelines to refine and enhance current practices were made. Rooted in the principles of client-centered care and efficiency, Stark, Landsbaum, and Palmer et al., (2020) identify and recommend strategies for occupational therapists. Home modifications reduce disability in older adults. Landsbaum, Palmer, and Somerville, (2020) posited that Client-centered home modifications improve daily activity performance of older adults. Mann, Ottenbacher, and Fraas, (2022) explained the effectiveness of assistive technology and environmental interventions in maintaining independence and reducing home care costs for the frail elderly. However, Cultural beliefs and values significantly impact individuals' perspectives on disability, independence, and help-seeking behaviors. Zahedi, (2023) notes that Islamic residences are intricately designed to accommodate families' diverse needs, considering factors such as lifestyle, comfort, culture, geography, economics, building

materials, and other relevant considerations. Peace and Darton, (2020) research underscore the importance of home modification or adaptation as a critical global concern, especially for older individuals with disabilities residing in traditional housing of varying ages, highlighting accessibility issues in design. Within the Qatar context, characterized by the prevalence of Islamic values and traditions, factors like modesty, privacy, and family dynamics may shape individuals' inclinations and choices regarding home modifications. Occupational therapists must undertake culturally sensitive communication and cooperation with clients and their families to grasp their cultural viewpoints and inclinations. Ali et al., (2022) underscored that Islamic architectural design endeavors to strike a harmonious equilibrium between family privacy and communal cohesion through meticulous planning of the transitions between private and public areas. However, despite these numerous studies that investigated the development of guidelines in home modification practice for occupational therapists, no study yet has been conducted particularly in Qatar which provides uniform guidelines in managing patients referred for home modification.

Thus, this study was focused on formulating guidelines for home modification practices tailored to occupational therapists in Qatar. These guidelines aimed to establish consistent protocols for managing patients referred for home modification. Additionally, the study investigated the current home modification practices of Occupational Therapists in Qatar and assessed the satisfaction levels of clients or their families with these practices. Proposed guidelines were developed to address any identified shortcomings in current practices, and their acceptability among occupational therapists in Qatar was evaluated. Ultimately, the study aimed to establish a baseline dataset that can inform future research, practice, and policy development in the field of home modification practices in Qatar. By documenting current practices, satisfaction levels, and proposed guidelines, the research aimed to contribute to ongoing efforts to enhance the quality, accessibility, and inclusivity of occupational therapy services in Qatar.

Objective of the Study

This study aims to determine and establish guidelines for home modification practices among occupational therapists in Qatar, with the objective of standardizing the management of clients referred for home modification. Specifically, the study seeks to achieve the following objectives (1) assess the current home modification practices of Occupational Therapists in Qatar, (2) evaluate the satisfaction levels of clients or families with the current home modification practices as assessed by Occupational Therapists in Qatar, (3) propose guidelines in home modification practices to address the identified gaps in current practices in Qatar and (4) evaluate the level of acceptability of the developed guidelines in home modification practices among occupational therapists in Qatar.

LITERATURE REVIEW

Home Modification Practices

Synthesizing the related literature on home modification practices provides a comprehensive understanding of the factors influencing effective guidelines for occupational therapists in Qatar. Studies such as those by Stark et al., (2018), Stark and Keglovits, (2017), and Zingaro, (2019) emphasize the importance of tailored home modifications to enhance accessibility and usability, particularly for older adults and individuals with disabilities. This emphasizes the necessity of culturally relevant recommendations, as highlighted by Hill et al., (2018) to address the local issues and programs are implemented and relevant to the unique needs and

preferences of people in Qatar's diverse demographic landscape. Furthermore, research by Clemson et al., (2023) and Stark and Landerman, (2017) demonstrates the positive impact of home modifications on activity performance and quality of life, emphasizing their significance in occupational therapy interventions. Law and Baum, (2015) discuss the role of home environments in promoting independent living among older adults, reinforcing the relevance of comprehensive guidelines for occupational therapists in Qatar to facilitate aging in place. Additionally, studies by Hammel and Magasi, (2017) and Bruce et al., (2017) emphasize the importance of consensus on best practices for home modification assessments and the effectiveness of occupational therapy interventions in promoting independence and well-being. These findings highlight the need for evidence-based guidelines that integrate the expertise of occupational therapists with the specific cultural, environmental, and demographic considerations of Qatar. In summary, synthesizing the related literature highlights the importance of developing culturally relevant and evidence-based step by step guidelines in home modification practices for occupational therapists in Qatar. By considering the unique needs of the population and drawing upon best practices from existing research, these guidelines aim to optimize the effectiveness of occupational therapy interventions and ultimately enhance the quality of life for individuals receiving services in Qatar.

In addition to the synthesis, it is crucial to acknowledge the dynamic nature of home modification practices within the context of Qatar's rapidly evolving urban landscape and cultural norms. Studies such as those by Moncada and Mire, (2017) and Stark and Landerman, (2017) highlight the importance of ongoing adaptation and innovation in response to changing client needs, technological advancements, and emerging trends in accessible design. Moreover, the significance of interdisciplinary collaboration and community engagement cannot be overstated in the development and implementation of effective home modification guidelines. Research by Wellecke et al., (2022) and Struckmeyer et al., (2020) highlights the value of involving architects, urban planners, engineers, and other relevant stakeholders to ensure the holistic integration of accessibility principles into residential spaces in Qatar.

Furthermore, considering the diverse socioeconomic backgrounds and living conditions prevalent in Qatar, it is essential for occupational therapists to address issues of affordability, sustainability, and scalability in their home modification recommendations. This aligns with the findings of Stark et al., (2017) and Jo and Kim, (2018) which emphasize the importance of cost-effective solutions and environmental considerations in promoting long-term independence and well-being among diverse client populations. In conclusion, a comprehensive synthesis of the related literature emphasizes the multifaceted nature of home modification practices and the complex interplay of factors influencing guideline development for occupational therapists in Qatar. By integrating evidence-based research, cultural sensitivity, interdisciplinary collaboration, and considerations of affordability and sustainability, the proposed guidelines aim to provide a strong framework for enhancing the accessibility, safety, and quality of home environments for individuals receiving occupational therapy services in Qatar.

Occupational Therapy in Qatar

In Occupational Therapy Reflections 2019 Volume 1, it was documented that Occupational Therapy (OT) services were first introduced in the 1980s at Rumailah Hospital by a dedicated team of Australian therapists. Their initiative was fueled by a recognition of the pressing need

and a forward-looking vision for OT services tailored to the population of Qatar. To address this need comprehensively, efforts were made to train locally available personnel in basic OT skills, laying a solid foundation for the establishment and growth of occupational therapy services within the country. Over the years, despite the departure or retirement of some of the original Australian therapists, the continuity and development of OT services have been sustained. Notably, individuals such as Sultan Hammam Al Abdulla, who was among the first staff members, have remained integral to the progress of occupational therapy within the Corporation. Their ongoing presence and expertise, particularly exemplified by Sultan Hammam Al Abdulla's current role as Chief of Occupational Therapy, symbolize a valuable link to the inception and evolution of OT services in Qatar. The expansion of occupational therapy services beyond Rumailah Hospital occurred in the early 2000s, with specialized areas such as Hand Therapy, Pediatric Acute Care Services, Seating and Mobility Services, and Occupational Therapy Services extending to other hospitals, residential care settings, and community rehabilitation programs. Subsequently, post-2010, a notable spread of occupational therapy services occurred across diverse healthcare settings, including the Skilled Nursing Facility, Residential Care Compound, Home Healthcare Services, Community Rehabilitation Services, Heart Hospitals, Qatar Rehabilitation Institute, Women and Wellness Research Center, and Community Mental Health facilities. This progressive expansion emphasizes the commitment to enhancing access to comprehensive occupational therapy services throughout Qatar, catering to the diverse needs of individuals across various healthcare contexts (Occupational Therapy Reflections, 2019).

In a report published by The Peninsula newspaper (2018), the establishment of the Simulated Living Suite at Qatar Rehabilitation Institute (QRI) was highlighted as a groundbreaking initiative aimed at assisting patients in relearning essential skills for regaining independence and reintegrating into their communities. This suite, also known as an Activities of Daily Living (ADL) room, provides a home-like environment equipped with accessible amenities such as a bedroom, bathroom, living room, and kitchen, along with specially adapted equipment. Patients with disabilities stemming from a diverse range of conditions, such as stroke, spinal cord injury, head injury, Guillain-Barre syndrome, and multiple trauma-related injuries, participate in self-care activities within the Simulated Living Suite. Under the guidance and supervision of Occupational Therapists (OTs), these individuals engage in tailored rehabilitation programs that align closely with contemporary principles and methodologies in the field of occupational therapy (The Peninsula newspaper, 2018). Sultan Al Abdulla, Chief of Occupational Therapy at QRI, emphasized the importance of home accessibility modifications and outlined plans to introduce assistive technologies like Electronic Aids to Daily Living (EADLs) in the future. This comprehensive approach, as reported by Peninsula Qatar (2018), reflects a significant advancement in rehabilitation strategies, promising long-term functional independence and improved quality of life for individuals with disabilities.

In keeping with the growing significance of home modification interventions in occupational therapy practice in Qatar, Hamad Medical Corporation (HMC) has extended its specialized rehabilitation services by introducing a modern simulated facility in an accessible environment at the Qatar Rehabilitation Institute (QRI). Known as Easy Street, this facility replicates real-world scenarios within a secure clinical setting, providing patients with the opportunity to take their initial independent steps towards recovery after enduring prolonged illness with life-altering medical conditions. Specifically tailored for individuals recuperating from conditions such as stroke or brain hemorrhage, traumatic brain injury, spinal cord injuries, orthopedic surgeries, and other medical ailments affecting their ability to perform

basic daily tasks at home, Easy Street serves as a crucial resource in their rehabilitation journey (Hamad Medical Corporation, 2021).

Existing Guidelines and Frameworks

Several international organizations have developed guidelines and frameworks to support occupational therapists in conducting home modifications. The American Occupational Therapy Association (AOTA) published a comprehensive guideline for home assessments and modifications, considering factors such as accessibility, safety, and usability (AOTA, 2020). This guideline addresses home modifications as an intervention to use when a person's abilities are incompatible with environmental demands. That intervention includes identifying, developing, implementing, and training in the use of home modifications. Using an evidence-based perspective and key concepts from the Occupational Therapy Practice Framework, this guideline provides an overview of the occupational therapy process and best practices for home modification interventions. Additionally, the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) emphasizes the importance of ensuring access to appropriate housing and home modification services for individuals with disabilities (United Nations, 2022). While these guidelines offer valuable insights into best practices for home modifications, there is a need to adapt and contextualize them to suit the cultural and environmental context of Qatar.

International Organizations such as the Shirley Ryan Ability Lab (SRAL), have posted frameworks related to home modification practice. The text assists occupational therapists in addressing the needs of consumers, including consideration of their current and future requirements, the nature and use of the home environment, understanding the technical aspects of the built environment, design approaches, and the application of a range of products and finishes to determine appropriate modification solutions (SRAL, 2023). Land and Housing Corporation (LAHC) Home Modification Guidelines provides clear guidance as to the suitability of modification to all Land and Housing Corporation properties and the appropriate allocation of financial responsibility between Land and Housing Corporation and the National Disability Insurance Scheme (NDIS, LAHC, 2018). Additionally, the American Disability Act (ADA) provides guidelines to ensure all spaces promote accessibility and usability for individuals with disabilities (Kent, 2023). The challenges associated with employing typical Western intervention models in international contexts, particularly in the realm of home modification, are highlighted by Malkawi et al. (2020). Such attempts may inadvertently perpetuate stereotypical assumptions about clients, including perceptions of dependency, malingering, or noncompliance. This emphasizes the importance of considering cultural diversity in the assessment and implementation of home modification interventions. As cited by Agner, (2022), some assessments lack guidance on how to adapt them effectively for use with clients from diverse cultural backgrounds.

These guidelines emphasize the importance of client-centered care, evidence-based practice, environmental assessment, and collaboration with interdisciplinary teams. While these international guidelines provide valuable principles and considerations, their applicability to the specific cultural context of Qatar requires careful consideration and adaptation.

Healthcare Policies and Initiatives in the Region

Qatar has been actively supporting numerous countries in the Gulf Cooperation Council (GCC) region and globally through its charitable endeavors aimed at promoting global health

(Peninsula, 2023). Additionally, initiatives such as the Middle East Forum on Quality and Safety in healthcare have played a crucial role in empowering healthcare professionals to excel, improve, and drive change (Peninsula, 2023). Within the GCC region, including Qatar and Saudi Arabia, there is a growing focus on establishing guidelines and standards for healthcare practices, including those related to occupational therapy. However, there appears to be a scarcity of specific guidelines addressing home modification practices within occupational therapy. Exploring research on regional and local guidelines within the GCC, especially those pertaining to disability services and accessibility standards, can offer valuable insights into pertinent considerations and regulatory frameworks applicable to home modification practices in Qatar. At present, there is no unified standard or guidelines for OT practice or the scope of OT practice in Saudi Arabia (Alodan et al., 2022). In the study of O'Connell et al., (2017), he stated that clinical guidelines exist to promote consistent best practice in patient care, to reduce unwarranted variation in care and to reduce the use of low-value interventions. Moreover, in the study of Donnelly et al., (2023) she stated that Occupational therapists analyze the personal factors unique to each client and make recommendations for home modifications that account for these individual factors. Da Silva Araujo, (2023) emphasized that with the rising demand for home modification, explaining the clinical reasoning process of expert clinicians will enable more occupational therapists to deliver the intervention successfully. Effective home modification interventions are dependent on tailored treatment approaches.

Research conducted by Lindsay et al., (2024) indicates that there are promising practices, policies, and interventions to improve accessible housing through methods such as home modifications, smart homes, mobile applications, and experimental devices. These strategies have the potential to enhance the quality of life for people with disabilities. However, in the context of Qatar's limited policies regarding home modification guidelines, there is a pressing need to advocate for and discover accessible housing solutions for individuals with disabilities.

Cultural Considerations in Home Modifications

Cultural factors play a significant role in shaping individuals' beliefs, values, and perceptions of disability, independence, and the home environment. It is essential for occupational therapists to understand and consider cultural considerations when planning and implementing home modifications to ensure interventions are relevant, respectful, and effective. Several key cultural considerations in the context of home modifications include: Cultural beliefs and values - cultural beliefs and values influence individuals' attitudes towards disability, independence, and help-seeking behaviors. Zahedi, (2023) observes that Islamic houses are specifically designed to meet the varied demands of the families, taking into account certain factors, for instance, lifestyle, comfort, culture, geography, economics, building materials, and other pertinent considerations. Research conducted by Peace and Darton, (2020) emphasizes the significance of home modification or adaptation as a crucial global issue, particularly for older individuals living with disabilities in conventional housing of different ages, predating concerns about accessibility in design. In the context of Qatar, where Islamic values and traditions are prevalent, considerations such as modesty, privacy, and family dynamics may influence individuals' preferences and decisions regarding home modifications. Occupational therapists must engage in culturally sensitive communication and collaboration with clients and their families to understand their cultural perspectives and preferences. Ali et al., (2022) emphasized that Islamic architectural design aims to establish a harmonic balance between family privacy and social togetherness by carefully planning the

transitions between private and public spaces. Gender roles and family dynamics - gender roles and family dynamics significantly influence individuals' experiences and expectations regarding home modifications. In numerous cultures, such as Qatar, traditional gender roles may impact household responsibilities, decision-making processes, and the distribution of caregiving duties. According to researchers Aliyu and Ismael., (2023), Privacy is inevitably a key component in Islamic housing architecture and is deeply ingrained in Islamic cultural traditions. These cultures value privacy as a virtue, which is cleverly expressed through architectural choices including room layout, door placement, and fence design. Design is further influenced by gender segregation, resulting in separate spaces for men and women that promote modesty and privacy. Religious and cultural practices - religious and cultural practices also shape individuals' daily routines, activities, and preferences regarding the home environment. An Islamic residence encompasses several vital elements including the principle of women seclusion and privacy (Ali et al., 2022). Islam has developed moral guidelines that dictate how people should behave towards one another as well as their way of life and manners (Bokhari et al., 2020). As symbolic symbols of the sanctity and isolation, ingrained in the Islamic concept of a house, the shape, qualities, and interaction of these aspects within dwellings are all important (Al-Baqara 2:233, 235, 236). Due to their divergent change trajectories, different cultures cannot fulfil their urban needs in the same way (Noma et al., 2022). The traditional Middle-Eastern and African building practices lay a strong emphasis on religious principles, interpersonal relationships, and neighborly interactions, with particular attention to respect the neighborly rights and follow religious precepts (Asif and Ismail, 2018).

In Qatar, where Islamic values and traditions are deeply ingrained in daily life, considerations such as prayer rituals, dietary restrictions, and social customs may influence individuals' preferences and priorities regarding home modifications. Occupational therapists should be knowledgeable about cultural and religious practices and collaborate with clients to ensure home modifications accommodate their religious and cultural needs. This may include creating designated prayer spaces, accommodating dietary preferences in kitchen modifications, and respecting cultural norms related to socializing and entertaining guests within the home environment. Language and communication - language and communication are essential aspects of culturally competent practice in occupational therapy. In Qatar, where Arabic is the official language, occupational therapists should be proficient in Arabic and English to effectively communicate with clients and their families. In her book "Introducing Language and Intercultural Communication", 2nd Edition, (2019), Jane Jackson examines the concept of culture and enculturation, focusing on the process of first language and cultural socialization in one's home environment. The discussion centers on definitions and shifting conceptions of culture, exploring various qualities and dimensions associated with this construct, such as culture as learned, shared, and relative. Jackson also explains the adopted definition of culture in the text.

Furthermore, Jackson explores the nature of communication and the multiple factors influencing the communication process, including culture, context, and power dynamics. She describes the characteristics and properties of communication, highlighting variations in communication styles and the potential influence of cultural elements. Additionally, Jackson offers suggestions for improving intercultural communication effectiveness, particularly in interactions with second language speakers. These insights are applicable not only to interactions involving second language speakers but also to intercultural situations involving speakers who share the same first language. Occupational therapists should employ culturally sensitive communication strategies, such as using interpreters when necessary, employing

plain language and visual aids, and demonstrating respect for clients' linguistic preferences and communication styles. Keglovits, (2020) highlight the importance of this aspect in their research. Their findings contribute to an expanding body of evidence showing how modifications impact the home experience. The high numbers of negative outcomes illustrate the need for occupational therapists to understand what client's value about their home and intended modifications and for service providers to routinely evaluate home modifications. Additionally, Baily et al., (2019) emphasize that an understanding of the dimensions of home that impact decision-making provides occupational therapists with a greater appreciation of the home experience, enabling them to enhance the effectiveness and acceptance of home modifications. The substantial prevalence of negative outcomes emphasizes the necessity for occupational therapists to grasp clients' values regarding their homes and planned modifications, and for service providers to regularly assess home modifications. Cultural considerations are integral to the planning and implementation of home modifications, ensuring interventions are respectful, relevant, and effective for individuals from diverse cultural backgrounds. By understanding and addressing cultural beliefs, values, gender roles, family dynamics, religious practices, and communication preferences, occupational therapists can create culturally sensitive and inclusive home environments that promote independence, safety, and well-being for clients in Qatar.

Environmental Factors and Accessibility

Environmental factors play a critical role in shaping the feasibility and effectiveness of home modifications. These factors encompass various aspects of the physical environment, neighborhood infrastructure, and community resources that influence individuals' ability to navigate and function within their living spaces. In the context of Qatar, several key environmental factors and accessibility considerations warrant attention. The design and layout of residential properties significantly impact the feasibility of home modifications. The conclusion drawn by Johansson et al., (2021) emphasizes the undeniable and pressing need to enhance accessibility in interactive systems, ensuring that everyone can access, interact with, and achieve their goals effectively. While the methods to achieve this vary considerably, different approaches to accessibility are aimed at the common goal of providing the most effective and usable opportunities for all potential system users, regardless of the challenges they may encounter. In Qatar, where rapid urbanization and housing development are prevalent, considerations such as the availability of single-story housing, wide doorways and hallways, and step-free entrances are crucial for ensuring accessibility and ease of modification for individuals with disabilities or mobility limitations.

The accessibility of neighborhood infrastructure, including sidewalks, roads, and public transportation, directly affects individuals' ability to access community resources and engage in social and recreational activities. In their study, Syaodih and Aprilesti., (2019) highlight the potential of inclusive and accessible areas within our residences, amenities, and localities to contribute to the creation of a more equal, inclusive, and cohesive society through the built environment. Everyone should have equal access to everything. People with disabilities will never be fully integrated into society if they cannot utilize the facilities and services offered by the community (Moore and Pubantz, 2023). Ease of access is indeed a value that each of us share, not just something that is provided for those with impairments (Pretto, 2020). It is believed that by implementing Universal Design standards, people with disabilities could obtain their rights to a city that is more hospitable and comfortable for them, reducing their dependence on others (Esfandfard et al., 2020). In Qatar, urban planning initiatives that prioritize pedestrian-friendly infrastructure, curb cuts, and wheelchair-accessible

transportation options can enhance mobility and independence for individuals with disabilities, thereby influencing the design and implementation of home modifications. Access to community support services, such as rehabilitation centers, healthcare facilities, and social service agencies, plays a vital role in supporting individuals with disabilities in their daily lives. Research by Whalley-Hammell, (2019) emphasizes the significance of community-based resources in facilitating independent living and participation in meaningful activities. In their study, Iucidi, (2019) highlighted the positive impact of employment and household income in addressing disparities in community participation between individuals with and without disabilities. Their findings emphasized the potential for socioeconomic factors to promote inclusivity and equality in volunteering, donations, and group involvement, thus emphasizing avenues for improving community engagement among individuals with disabilities.

In the context of Qatar, where an increasing number of individuals with health conditions are residing in community settings, the findings summarized from Stark et al., (2017) systematic review on home modification interventions carry significant relevance. Qatar's evolving healthcare landscape and growing emphasis on community-based care highlight the importance of understanding and implementing effective home modification strategies tailored to the needs of individuals with health conditions. With Qatar's commitment to enhancing accessibility and inclusivity, the components identified in the review, such as assessing individuals' activities of daily living, evaluating home environments, and engaging professional expertise, serve as valuable insights for policymakers, healthcare providers, and community organizations.

Moreover, the review's emphasis on multi-component interventions aligns with Qatar's holistic approach to healthcare delivery, emphasizing comprehensive solutions to improve functional performance, mitigate fall risks, and support caregivers in the community. Integrating these evidence-based findings into Qatar's home modification initiatives can contribute to fostering a supportive and enabling environment for individuals with health conditions, ultimately enhancing their quality of life and independence within the community. Identifying and mitigating environmental hazards within the home environment are essential aspects of home modification practices. Research by Stark et al., (2017) emphasizes the importance of conducting safety assessments to identify potential risks and hazards, such as uneven flooring, inadequate lighting, or inaccessible bathroom fixtures. The pioneering study conducted on bathroom falls in Qatar sheds light on a pressing issue concerning public health and safety. According to findings from the study, approximately 40 patients annually seek treatment at Hamad Medical Corporation's (HMC) Trauma Center due to severe injuries resulting from bathroom accidents (Hollinghurst, 2018).

The findings from Starks et al.'s study (2017) on the effectiveness of home modification interventions to reduce falls among older adults resonate with the current situation in Qatar. With a growing aging population and increasing concerns about falls and related injuries, there is an urgent need to prioritize and implement evidence-based home modification programs tailored to the unique needs of older adults in Qatar. By leveraging similar intervention strategies, such as the Home Hazard Removal Program, Qatar can potentially enhance the safety and quality of life for its older adult population, contributing to a more age-friendly and inclusive environment. Incorporating sustainable and environmentally friendly design principles into home modifications can have positive implications for both individuals and the broader community. Several United Nations Sustainable Development Goals (SDGs) are indeed connected with energy use in the built environment, from Goal 7

‘Ensure access to affordable, reliable, sustainable and modern energy for all’ to Goal 11 ‘Make cities and human settlements inclusive, safe, resilient and sustainable’ and Goal 13 ‘Take urgent action to combat climate change and its impacts (Marchi and Gaspari, 2023). As buildings become smarter and more energy efficient (towards net zero or positive energy), it has been estimated that the role of end-users in shaping the energy demand will also increase (van den Brom et al., 2019). Research by Branco et al., (2020) highlights the benefits of green design features, such as energy-efficient appliances, water-saving fixtures, and eco-friendly building materials, in promoting sustainability and reducing environmental impact. In Qatar, initiatives to promote sustainable building practices and green technologies can be integrated into home modification interventions to create environmentally conscious living spaces that align with Qatar's vision for sustainable development and environmental stewardship. Environmental factors and accessibility considerations are integral components of home modification practices, significantly influencing the feasibility, effectiveness, and sustainability of interventions. In the context of Qatar, addressing these factors requires a comprehensive approach that considers housing design, neighborhood infrastructure, community support services, environmental hazards, and sustainability principles. By integrating these considerations into home modification interventions, occupational therapists can create living environments that promote independence, safety, and well-being for individuals with disabilities or functional limitations in Qatar (Starks et al., 2017).

Technology and Innovation in Home Modifications

Advancements in technology have revolutionized home modification practices, offering innovative solutions to enhance accessibility, safety, and independence for individuals with disabilities or functional limitations. These technological innovations encompass a wide range of devices, systems, and applications designed to address specific needs and improve the quality of life for users. In the context of home modifications, several key areas of technology and innovation warrant attention. Smart home technologies utilize interconnected devices and sensors to automate and control various aspects of the home environment, such as lighting, temperature, security, and entertainment systems. Research by Waleed et al., (2018) suggests that smart homes give a revolutionary life experiment, being the new trend of residential expansion in the future. Nowadays, there are many advanced technologies equipped with many sensors which can be applicable to smart homes. These technologies enable the user to communicate with home devices via the Internet and smartphone; and enhance the capability of home devices such as monitoring, warning and remote controlling etc. to assist and support our life. These technologies can be integrated into home modification interventions to create intelligent living spaces that adapt to users' needs and preferences, promoting independence and safety. Li et al., (2020) emphasized the technical and psychological accessibility can be addressed by fully investigating the views and needs of older people when implementing smart homes.

Aqel et al., (2019) asserted that globally, over half a billion individuals are disabled due to physical, mental, or sensory impairments. They highlighted the role of rehabilitation technologies in enhancing the self-reliance and integration of people with disabilities into various aspects of life, including work, education, and social settings. Assistive technologies, defined as hardware or software products aimed at aiding individuals with disabilities in maintaining or regaining their functionality and independence, were identified as crucial tools for promoting the well-being of such individuals. Advancements in robotics technology have led to the development of assistive robots designed to support individuals with disabilities in performing activities of daily living. Nanavati et al., (2023) highlighted the potential of

mobile and manipulator robots to aid individuals with disabilities in their daily activities by navigating human environments and engaging in physical interactions with objects and people. Turja et al., (2020) noted that Care robots are expected to provide assistance with daily living, cognitive support and training, support for caregivers, collaboration in a smart-home environment, social interactions and remote medical triage. They should prolong the independent living of older people, enable autonomy for disabled people and substantially aid caregiving in private homes and institutional settings (Romano et al., 2019). In the context of home modifications, assistive robotics can complement traditional interventions by providing additional support and assistance for individuals with mobility impairments or dexterity challenges, enabling greater autonomy and participation in daily activities. Telehealth platforms and remote monitoring systems leverage digital technologies to deliver healthcare services and monitor individuals' health remotely. Galea, (2018) conducted research indicating that telerehabilitation strengthens the patient-provider connection by enhancing the knowledge of the patients and their contextual factors, providing information exchange and facilitating education, and establishing shared goal setting and action planning.

Incorporating new digital technologies into rehabilitation could help to meet these demands. Digital rehabilitation (DR) can be defined as using digital technologies as a part of the rehabilitation process. DR aims to optimize functioning and reduce disability of individuals with health conditions in interaction with their environment. This includes, but is not limited to, the use of tele- and remote rehabilitation applications and services, automatic services, robot-assisted technologies, wearables, emails, video, speech, and SMS text messaging solutions (Rehabilitation. World Health Organization, 2023). In the context of home modifications, telehealth and remote monitoring can facilitate remote assessments, consultations, and follow-up care, allowing occupational therapists to deliver personalized interventions and support individuals in managing their health and well-being from the comfort of their homes. Virtual reality (VR) simulations offer immersive and interactive experiences that simulate real-world environments and activities. Dede et al., (2017) highlighted that the immersive environments created by Virtual Reality (VR) technology, including 3D virtual worlds or games, are compelling due to their ability to enrich learning through situational experiences, diverse perspectives, and knowledge transfer.

Lee, (2019) noted that Virtual Reality (VR) has seen gradual expansion and application across diverse fields, including defense, medical care, architecture, and education, with related content being actively developed. Specifically, in healthcare, there has been a notable increase in efforts to introduce VR into rehabilitation treatment, surgical procedures, medical training, and emotional management. In the context of home modifications, VR simulations can enhance the design and planning process, enabling therapists and clients to explore different modification options, assess their feasibility, and make informed decisions about the most suitable interventions. Na and Shun, (2021) concluded that VR technology has potential value in the home modification process. Technology and innovation have transformed home modification practices, offering new possibilities for enhancing accessibility, safety, and independence for individuals with disabilities or functional limitations. This chapter has provided an in-depth review of literature related to home modification practices for occupational therapists, with a focus on the context of Qatar. It has highlighted the importance of considering cultural, environmental, and technological factors in designing and implementing home modifications that meet the needs of individuals in Qatar.

METHODOLOGY

This study, which aimed to determine the developing guidelines in home modification practice for occupational therapists in Qatar, utilized the descriptive developmental design. Employing a descriptive developmental research design, this study will seek real facts related to the current situation of home modifications in Qatar, focusing on description, comparison, analysis, and interpretation of existing data. McLaren and Bruner, (2022) define the descriptive developmental method aligns with the objectives of this study by facilitating the observation and documentation of behaviors, abilities, and characteristics of individuals involved in the home modification process. This method emphasizes the systematic examination of existing data to inform the development of guidelines tailored to the unique needs and contexts within Qatar. Furthermore, the research design draws inspiration from the insights provided by Hung et al., (2023) descriptive developmental research as a systematic inquiry into designing, developing, and evaluating programs, processes, and products. By adopting a descriptive developmental approach, this study seeks to systematically study the evolution of home modification practices, ensuring internal consistency and effectiveness in the guidelines proposed.

In light of McCombes's (2019) proposal of the descriptive developmental design as a suitable methodology for studying developmental processes, particularly in fields like developmental psychology, this research aligns with the established framework for investigating how individuals and practices evolve over time. By applying this method, the study aims to contribute to the advancement of home modification practices and enhance the effectiveness of occupational therapy interventions in Qatar. The respondents were five (5) working occupational therapists involved in home modification practice in Qatar and thirty (30) clients who had undergone home modification. In this study, the clients involved were selected using purposive sampling. The following inclusion criteria for the clients were set for this study: those who had not undergone home modification were excluded if they did not meet the criteria. The instruments used to measure the variables of the study were researcher-made questionnaires. Part one (1) of the instrument focused on the current home modification practices of occupational therapists in Qatar. Part two (2) included indicators measuring the level of satisfaction of the clients with the current home modification practices assessed by occupational therapists in Qatar. Part three (3) outlined the proposed step-by-step guidelines in home modification practices to address the current practices in Qatar. Part four (4) contained indicators measuring the level of acceptability of the developed guidelines in home modification practices among occupational therapists in Qatar.

Since all the instruments were created by the researcher, all the questions are subjected to content validity testing by three (3) experts in the field before being distributed to the participants. This is to ensure that the questions on the survey were understandable and acceptable to the intended respondents. The research questions included in the survey were developed based on theoretical discussions regarding relevant topics in the area of home modification. Subsequently, these research questions were reviewed by the adviser for final approval. To determine the level of satisfaction of the client or family in the current home modification practices assessed by occupational therapists in Qatar and the level of acceptability of the developed guidelines in home modification practices for occupational therapists in Qatar, the study utilized an instrument known as the Evaluation and Scoring, which is based on the standard weighted mean interpretation shown below.

Assigned Points	Numerical Range	Verbal Interpretation
4	3.51 – 4.00	Very High
3	2.50 – 3.50	High
2	1.75. – 2.49	Low
1	1.00 – 1.74	Very Low

Prior to conducting the survey, consent was obtained from both clients and occupational therapists. Participants were reassured about the privacy and confidentiality of their information. The data collection process involved gathering responses from both occupational therapists and clients. Participants were presented with various question types, including multiple-choice, fill-in-the-blank, and Likert scale items, and were asked to respond by circling the appropriate choices. Once completed, the questionnaires were distributed to the respondents, who voluntarily and privately filled them out. The collected information was then tallied and subjected to statistical analysis, focusing on descriptive statistics. Microsoft Excel was utilized for this analysis. Quantitative data from the returned surveys were coded and entered into the spreadsheet for thorough examination of trends and patterns.

Weighted Mean was calculated the level of satisfaction of the client or family with the current home modification practices assessed by Occupational Therapists in Qatar and the level of acceptability of the developed guidelines in home modification practices for Occupational Therapists in Qatar

RESULTS

Table 1. The response of occupational therapists regarding current home modification practices yielded a total of five respondents from various hospitals in Qatar.

Home Modification Practices	Response	Frequency	Percentage
Home assessment tool/s used if any, provides all your current needs	Yes	0	0
	No	5	100
Current home assessment tool/s provides enough data that communicates effectively across multidisciplinary teams	Yes	0	0
	No	5	100
Participated in any research studies related to home modifications.	Yes	0	0
	No	5	100
Use of standard guidelines in conducting home assessment and modification	Yes	0	0
	No	5	100
Like to have a standard step by step guideline to follow in carrying out home assessment and modification in your area of practice	Yes	5	100
	No	0	0
Name of home assessment tool/s used: Five (5) respondents answered none.			

This survey revealed 5 responses equaling a return rate of 100%. Of the Five (5) occupational therapists that responded 100% had achieved a bachelor's degree with Qatar Council for Healthcare Practitioners (QCHP) license OT. Therapists were asked if their

current home assessment tool provides enough data that communicates effectively across multidisciplinary teams to justify the implementation of home modifications. Of those five (5) therapists that responded, one hundred percent (100%) answered that their current home assessment tool had not provided enough data that communicates effectively across multidisciplinary teams to justify the implementation of home modifications. One hundred percent (100%) responded “No” to having been involved with any research studies or follow-up studies to ensure proper implementation and follow through with recommendations for home modification. A majority of the respondents answered “No” when asked if they are using standard step by step guidelines in conducting home assessment in modification. The Question asked respondents if they like to have step by step standard guidelines to follow in carrying out home assessment and modification. One hundred percent of the respondents replied “Yes” that they like to have step by step guidelines to follow in administering home assessment. This survey found no assessment tools currently being used by occupational therapists in the area of home modification that have published studies. Those therapists responding to this survey were then instructed to skip the question if they had answered no home assessment tools have been used that encompass home modification practice.

Table 2. The Clients or family’s level of satisfaction in the current home modification practices assessed by Occupational therapists in Qatar along with weighted mean, their verbal interpretation and rank.

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. I am satisfied with the time that home modification services are initiated upon receiving a referral.	3.06	High	3
2. I am satisfied with the occupational therapist’s professionalism, training and experience to explain the process and assessment of home modification needs.	3.13	High	3
3. I am satisfied with the level of involvement that I received in setting up goals and priorities.	3.13	High	3
4. I am satisfied with the appointment and schedule given by the occupational therapist.	3.13	High	3
5. I am satisfied with the collaboration between me and my home modification specialist during home visit.	3.06	High	3

6. I am satisfied with the level of involvement that I received during the planning and preparing the plans and specification.	3.13	High	3
7. I am satisfied with the pre-implementation process in addressing full agreement on the design or layout and the assistive devices that needed.	3.16	High	3
8. I am satisfied with coordinating the design and identifying who is responsible for financing the home modification.	3.13	High	3
9. I am satisfied with my home modification specialist by keeping me updated every step of the construction process.	3.16	High	3
10. I am satisfied with the re-evaluation to ensure modification is safe, suitable, that the work specified has been completed based on the standards provided.	2.86	High	3
11. I will recommend the home modification services provided by occupational therapists working here in Qatar to other patients to address their issues in safety and accessibility at home.	3.46	High	3

The weighted mean of 3.46 suggests that clients and families expressed a “High” level of satisfaction with the home modification services provided by occupational therapists working in Qatar, indicating they would recommend these services to other patients to address safety and accessibility issues at home.

A weighted mean of 3.16 indicated a “High” level of satisfaction among clients and families with the following statements: “I am satisfied with the pre-implementation process, including full agreement on the design or layout and the assistive devices needed,” and “I am satisfied with my home modification specialist for keeping me updated at every step of the construction process.”

The clients and families expressed a “High” level of satisfaction with various aspects, including: the professionalism, training, and experience of the occupational therapist in explaining the home modification process and assessment of needs; the level of involvement in setting up goals and priorities; satisfaction with appointment scheduling by the occupational therapist; the level of involvement during planning and preparing plans and specifications; and coordinating the design and identifying responsible parties for financing the home modification. These aspects collectively yielded a weighted mean of 3.13.

Furthermore, a weighted mean of 3.06 indicated a “High” level of satisfaction with the following aspects: the initiation time of home modification services upon receiving a referral, and the collaboration between clients and their home modification specialist during home visits.

In conclusion, a weighted mean of 2.80 indicated a “High” level of satisfaction among clients and families with the re-evaluation process, ensuring that modifications are safe and completed according to standards. Overall, a General Average of 3.13 indicates a “High” level of satisfaction among clients and families with the current home modification practices assessed by Occupational Therapists in Qatar.

Table 3. The proposed step by step guidelines to home modification practices for occupational therapists to address the current practices in Qatar.

3.1.	Referral – Home modification services are initiated upon receiving an order from physicians of different hospitals or clinics in Qatar.
3.2.	Initial Assessment – Occupational therapists will conduct initial evaluation with the person what their needs are in relation to home environment and ensure that all relevant information is available.
3.3.	Goal setting – Identify the specific occupations the person needs or wants to do and his/her priorities. Identifies the occupations impacting upon their health and wellbeing.
3.4.	Scheduling – Inform the patient, contact the family or sponsor at least one day prior to home assessment and clearly state the purpose of assessment and the importance of an accessible and safe home environment.
3.5.	Home visit – Carry out accessibility and safety assessment of the home environment to identify the areas of concerns.
3.6.	Planning - Offer solutions to the patient, family or sponsor resolve issues, short and long term goals, provide recommendations along with layouts, standards and the assistive devices that the patient requires. Provides a list of suppliers who provide assistive devices and materials for home modification.
3.7.	Pre - implementation- Obtain full agreement on the design or layout and the assistive devices that are needed.
3.8.	Funding – Coordinate design, procurement and identify who is responsible for financing the home modification.
3.9.	Implementation – Construction of the occupation-based home modification.
3.10.	Completion – Conduct site visit and re-evaluation when work is completed to ensure modifications are safe, check suitability, that the

work specified has been completed based on the standards provided and to ensure that the patients or family is satisfied and happy.

The proposed step by step guidelines in home modification practices aimed at addressing current practices in Qatar are supported by the importance of documentation in occupational therapy services. According to the American Occupational Therapy Association (AOTA), documentation of occupational therapy services is crucial whenever professional services are provided to a client. Occupational therapists and occupational therapy assistants are responsible for determining the appropriate type of documentation structure and recording the services provided within their scope of practice (AOTA, 2020).

Table 4. The level of acceptability of the developed guidelines in home modification practices for occupational therapists in Qatar along with weighted mean, their verbal interpretation and rank.

Indicators	Weighted Mean	Verbal Interpretation	Rank
1. The guidelines are easy to follow and appropriate to use.	3.8	Very High	4
2. The guidelines require new skills to accomplish.	3.4	High	3
3. The guidelines demand changes in your routine.	3.4	High	3
4. The guidelines protect OT against making errors.	3.6	Very High	4
5. The guidelines cover all the specified tasks and objectives of a home assessment.	3.4	High	3
6. The guidelines enable the accomplishment of specified tasks and objectives of home assessment.	3.4	High	3
7. The guidelines can be used by any OT assigned in home assessment and modification.	3.6	High	3
8. The guidelines components meet the needs for consistency.	3.6	Very High	4
9. The guidelines provide step by step instruction on home to carry out home assessment program.	3.6	Very High	4
10. The guidelines assist OT in making decisions, which aids them in battling uncertainty and reducing variability in clinical practice.	3.6	Very High	4

The feedback from respondents regarding the usability and effectiveness of the guidelines for home assessment and modification was overwhelmingly positive. With a weighted mean of 3.80, all five respondents expressed a resounding "Very High" level of acceptability towards the guidelines, emphasizing their ease of use and appropriateness. Similarly, the satisfaction level remained "High" with a weighted mean of 3.60 for various aspects of the guidelines. Respondents expressed a high level of acceptability regarding the effectiveness of the guidelines. They noted that the guidelines served as a protective measure against errors, were adaptable for any occupational therapist (OT) assigned to home assessment and modification, ensured consistency in practice, provided clear step-by-step instructions, and assisted OTs in decision-making processes, thereby reducing uncertainty and variability in clinical practice. Finally, respondents expressed a "High" level of acceptability towards the following statements: 'The guidelines require new skills to accomplish,' 'The guidelines demand changes in your routine,' and 'The guidelines cover all the specified tasks and objectives of a home assessment. Additionally, they noted that "The guidelines enable the accomplishment of specified tasks and objectives of home assessment" with a weighted mean of 3.40. In summary, the overall weighted mean of 3.54 revealed that respondents had a "High" level of acceptability of the developed guidelines in home modification practices for occupational therapists in Qatar.

DISCUSSION

1. The response of occupational therapists regarding current home modification practices in Qatar.

In the context of home modification practice in Qatar, occupational therapists play a crucial role in ensuring the safety and functionality of living spaces for individuals with diverse needs. This practice aligns with the principles outlined in the document published by the American Occupational Therapy Association (AOTA), (2021), which emphasizes the importance of continuing competence for occupational therapists and occupational therapy assistants. AOTA asserts that ongoing self-assessment and professional development are essential for enhancing knowledge, professional reasoning, interpersonal skills, performance skills, and ethical practice. This commitment to continuous improvement enables occupational therapists in Qatar to effectively fulfill their roles and responsibilities in adapting home environments to meet the evolving needs of their clients, thereby enhancing overall well-being and independence.

2. The Clients or family's level of satisfaction in the current home modification practices assessed by Occupational therapists in Qatar.

The assessment of clients' or families' satisfaction with current home modification practices conducted by occupational therapists in Qatar aligns with the findings of a previous study. This study indicated that participants perceived significant improvements in safety, accessibility, privacy, and occupational performance, particularly in the realm of self-care activities, following home modifications. The active involvement of occupational therapists in providing sufficient information and engaging clients or caregivers in decision-making processes contributed to enhanced satisfaction and perceived effectiveness with the completed modifications from the clients' perspectives (Lau et al., 2018).

3. The Proposed guidelines in home modification practices for occupational therapists to address the current practices in Qatar.

Step by step guidelines to home modification:

The guidelines are further reinforced by AOTA's Standards of Practice for Occupational Therapy (2020), which emphasize the necessity for occupational therapy practitioners to adhere to established time frames, formats, and standards for documentation as determined by practice settings, government agencies, external accreditation programs, payers, and AOTA documents. These requirements apply to both electronic and written forms of documentation and are essential in reflecting the nature of services provided, the clinical reasoning of the occupational therapy practitioner, and ensuring the safe and effective delivery of services (AOTA, 2022).

4. The level of acceptability of the developed guidelines in home modification practices for occupational therapists in Qatar.

The level of acceptability of the developed step by step guidelines in home modification practices for occupational therapists in Qatar is consistent with findings from other research. Previous studies have highlighted the importance of starting the home environmental modification process with a comprehensive assessment of the individual's needs within their current home environment (Struckmeyer et al., 2020). Research has demonstrated that home environmental modifications contribute to promoting a better person-environment fit, as outlined in the person-environment-occupation (PEO) model (Baker et al., 2020). Moreover, standardized assessments with established psychometrics are considered essential for delivering a systematic approach to addressing the environmental needs of individuals with disabilities (Patry et al., 2019). Literature reviews have emphasized the use of standardized assessments in the home environment, suggesting that researchers employ standardized outcome measures to consistently measure functional abilities and tailor interventions to specific populations (Mukaino et al., 2020). Oaks, (2017) focused on interventions and identified various psychometric outcome measures utilized to evaluate the outcomes of home modifications, further supporting the importance of standardized assessments and tailored interventions in achieving positive outcomes in home modification practices.

CONCLUSIONS

The following were the conclusions of the study based on the findings.

1. Occupational therapists in Qatar recognized the importance of home modification in their practice, but the lack of established guidelines and evidence-based protocols is concerning. Dissatisfaction with current knowledge in home modification emphasizes the need for improvement and refinement of practices.

2. Clients and families expressed satisfaction with current home modification practices in Qatar, attributing their agreement to factors such as recommendations, therapist involvement, collaboration, and safety measures.

3. The step by step guidelines for home modification assists the Occupational Therapists to evaluate their clients home environment professionally. With the use of these guidelines, the respondents had less problems encountered when carrying out home assessment and modification.

4. Evaluation feedback from occupational therapists regarding the proposed step-by-step guidelines was generally positive or favorable, indicating a high level of acceptance and satisfaction with the suggested framework for guiding their practice in home modification interventions.

Based on the findings and conclusions clarified in this study, the following recommendations are hereby endorsed, serving as informed and evidence-based guidelines for future actions or decisions in the relevant context.

1. Occupational therapists specializing in home modification and recommendation. To ensure a more comprehensive understanding and representation of occupational therapy practices in the State of Qatar, it is recommended to broaden the scope of participants to encompass diverse occupational therapists across various specialties and settings within the region.
2. Therapists utilize the established guidelines as a framework for conducting research studies aimed at investigating various aspects of home modification, thereby ensuring consistency and standardized practices across diverse research endeavors in this field also attend to workshops focusing on home modification be offered as part of continuing education opportunities, thereby facilitating ongoing professional development and enhancing the knowledge and skills of occupational therapists in this specialized area of practice.
3. Researchers need to collaborate with the different hospitals or clinics in the country to disseminate the proposed step by step guidelines for home modification practice as a practical way to evaluate the safety, accessibility and quality of living for the individual at home or accommodations and recommendations for improvement which facilitate engagement of functional activity at home.
4. Future researchers need to conduct a greater number of research studies within Qatar's context to ensure the attainment of high-quality outcomes and to enhance the reliability and validity of the guidelines established for home modification practices. This will contribute significantly to advancing the field of home modification and promoting evidence-based interventions tailored to the needs of the local population.

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REFERENCES

- AdamuJatau Noma, T., Bakr Ali, F., & El SayadZeyad, M. (2022). Integration of Hausa Traditional Architecture in the Development of Abuja: A Methodological Approach. *International Journal of African Society, Cultures and Traditions*, 10(1), 27-39.
- Agner, J. (2020). Moving from Cultural Competence to Cultural Humility in Occupational Therapy: A Paradigm Shift. *The American Journal of Occupational Therapy*, 74(4), 7404347010p1–7404347010p7.
- Al-Baqara 2:233, 235, 236. Transliteration.
- Ali, M., Ariffin, M. F. M., Ahmad, M. N., & Safie, S. (2022). Islamic Values in The Design of Residential Internal Layout. *International Journal of Academic Research in Business and Social Sciences*, 12(11), 1728-1740.
- Ali, N., & Kumar, S. (2022). Assessing the physical needs and creating a barrier free environment at home for the person with challenging conditions and elderly. *International journal of convergence in healthcare*, 2(2), 8-16.
- Aliyu, A. A., & Ismail, A. S. (2023). *Journal of Islamic Thought and Civilization*. Lahore, 13(2), 49-69.
- Alodan, H. A., & Squire, R. (2022). Emerging occupational therapy in mental health practice in Saudi Arabia: a qualitative study. *Occupational Therapy in Mental Health*, 38(3), 296–317.
- American Occupational Therapy Association (AOTA). (2020). Occupational Therapy Practice Guidelines for Home Modifications. Retrieved from https://library.aota.org/OT_Practice_Guidelines_Home_Modification
- American Occupational Therapy Association (AOTA). (2020). Standards of Practice for Occupational Therapy. Volume 64, Number 6(Supplement).
- American Occupational Therapy Association. (2020). Occupational Therapy Practice Framework: Domain and Process (4th ed.). American Occupational Therapy Association.
- American Occupational Therapy Association. (2020). Occupational Therapy Practice Guidelines for Home Modifications.
- American Occupational Therapy Association. (2021). Standards for Continuing Competence in Occupational Therapy. *The American Journal of Occupational Therapy*, 75(Supplement_3), 7513410040.
- Aqel et al. (2019). Review of Recent Research Trends in Assistive Technologies for Rehabilitation. In 2019 International Conference on Promising Electronic Technologies (ICPET) (pp. 16-21). Gaza, Palestine.
- Asif et al., (2018). Design framework for urban mosque in the city of Kuala Lumpur: A qualitative approach. *International Journal of Architectural Research*.
- Bailey et al., (2019). "What? That's for Old People, that." Home Adaptations, Ageing and Stigmatisation: A Qualitative Inquiry. *International Journal of Environmental Research and Public Health*, 16(24), 4989.
- Baker, G., Grensteiner, E., & Lindemann, R. (2020). Fostering Improvement in Occupational Performance Through Environment Modification in Skilled Nursing Facilities. *Critically Appraised Topics*, 6. Retrieved from <https://commons.und.edu/cat-papers/6>
- Bokhari, A. S., Hammad, M. T. M., & Beggas, D. (2020). Impact of Islamic Values and Concepts in Architecture. In *Sustainable Development and Planning XI*

- Branco, P., Mateus, R., de Brito, J., & Gou, Z. (2020). Sustainable building assessment methods: A critical review. *Energy and Buildings*, 223, 110187.
- Bruce et al., (2017). PreFIT Intervention (MFFP) Group; PreFIT Study Group. The design and development of a complex multifactorial falls assessment intervention for falls prevention: The Prevention of Falls Injury Trial (PreFIT). *BMC Geriatr*.
- Cambridge Dictionary. (2024). Guidelines. In Dictionary.Cambridge.org dictionary. Retrieved January 15, 2024, from <https://dictionary.cambridge.org/dictionary/english/guidelines>
- Cambridge Dictionary. (2024). Step by step. In Dictionary.Cambridge.org dictionary. Retrieved January 15, 2024, from <https://dictionary.cambridge.org/dictionary/english/step-by-step>
- Cipresso et al., (2018). The past, present, and future of virtual and augmented reality research: A network and cluster analysis of the literature. *Frontiers in Psychology*, 9, 2086.
- Clark L., Lysack & Mickelson, M. M. C. (2022) Perceptions of Occupational Therapy Practitioners in Recognizing and Addressing Older Adult Food Insecurity.
- Clemson et al., (2023). Environmental interventions for preventing falls in older people living in the community. *Cochrane Database of Systematic Reviews*.
- da Silva Araujo et al., (2022). Clinical reasoning in occupational therapy practice: A scoping review of qualitative and conceptual peer-reviewed literature. *The American Journal of Occupational Therapy*, 76(3), 7603205070.
- Dede, C. J., Jacobson, J., & Richards, J. (2017). Introduction: Virtual, augmented, and mixed realities in education. In D. Liu, C. Dede, R. Huang, & J. Richards (Eds.), *Virtual, Augmented, and Mixed Realities in Education*. Gateway East: Singapore.
- Donnelly et al., (2023). Occupational therapy services in primary care: A scoping review. *Primary Health Care Research & Development*, 24, e7.
- Dorsey, E. R., Topol, E. J., & State of Telehealth. (2020). The state of telehealth. *New England Journal of Medicine*, 383(6), 558-559.
- Esfandfar, E., Wahab, M. H., & Amat, R. B. (2020). Is Tehran's Public Spaces Disability Friendly? The 1st International Conference on Urban Design and Planning.
- Foster J., Boniface, G., & Morgan, D. (2019). The central role of the occupational therapist in facilitating housing adaptations/home modifications for disabled children. *British Journal of Occupational Therapy*, 80(6), 375-383.
- Galea, M. (2019). Telemedicine in Rehabilitation. *Phys Med Rehabil Clin N Am*, 30, 473-483.
- Gitlin, I., Sheth, S., & Cogle, C. R. (2021). Home modifications for older adults: A systematic review. *Journal of Applied Gerontology*, 42(5), 1151-1164.
- Gitlow, L., & Deitz, J. (2019). *Occupational Therapy and Home Modification: Promoting Safety and Supporting Participation*. Slack Incorporated.
- Green Building: Improving the Lives of Billions by Helping to Achieve the UN Sustainable Development Goals. (n.d.). Retrieved July 15, 2023, from <https://www.worldgbc.org/news-media/green-building-improving-lives-billions-helping-achieve-un-sustainable-development-goals>
- Hamad Medical Corporation. (2021). Minister of Public Health Opens Easy Street Patient Rehabilitation Facility. Retrieved from <https://www.hamad.qa/EN/news/2021/February/Pages/Minister-of-Public-Health-Opens-Easy-Street-Patient-Rehabilitation-Facility.aspx>
- Hammel, J., & Magasi, S. (2017). Building consensus on best practices for home modification assessments. *The Gerontologist*, 57(5), 915-919.

- Hill et al. (2018). What works in falls prevention in Asia: A systematic review and meta-analysis of randomized controlled trials. *BMC Geriatrics*, 18(1), 3.
- Hocking, C. (Ed.). (2017). *Occupational Therapy in Housing: Building on Firm Foundations*. Routledge.
- Hollinghurst et al. (2018). Study protocol for investigating the impact of community home modification services on hospital utilisation for fall injuries: A controlled longitudinal study using data linkage. *BMJ Open*, 8, e026290.
- Hung et al., (2023). The model of descriptive, diagnostic, predictive, and prescriptive analytics on 100 top-cited articles of nasopharyngeal carcinoma from 2013 to 2022: Bibliometric analysis. *Medicine*, 102(6), e32824.
- Investopedia. (2021). Home modification. In Investopedia.com. Retrieved October 15, 2022, from <https://www.investopedia.com/terms/h/homemodification.asp>IOP Conf. Series: Materials Science and Engineering.
- Jackson, J. (2019). *Introducing Language and Intercultural Communication (2nd Edition)*. Jane Jackson.
- Jo, Y.-J., & Kim, H. (2018). Effects of Occupation-Based Home Modification and Intervention Using Assistive Devices on Activities of Daily Living Performance and Risk Factors at Home in Community-Dwelling People With Disabilities. *Korean Journal of Occupational Therapy*, 26(3), 79-90.
- Johansson, S., Gulliksen, J., & Gustavsson, C. (2021). Disability digital divide: The use of the internet, smartphones, computers and tablets among people with disabilities in Sweden. *Universal Access in the Information Society*, 20(1), 105–120.
- Keglovits, M., & Stark, S. (2020). Home modifications to improve function and safety in the United States. *Journal of Aging and Environment*, Pages 110-125.
- Kent, J. (2023). *ADA in details: interpreting the 2010 Americans with disabilities act standards for accessible design*. John Wiley & Sons.
- Krieger et al., (2023). Beyond waking and walking. Intensive rehabilitation in patients requiring extended durations of advanced mechanical circulatory support: A case series.
- Land and Housing Corporation. (2018). *Home Modification Guidelines*. Retrieved from <https://www.homemods.info/Download.ashx?File=b3c77ace7cdd077f97cef4f6425ec8&C=31342c3335382c30>
- Lau et al., (2018). Clients' Perspectives of the Effectiveness of Home Modification Recommendations by Occupational Therapists. *Occupational Therapy In Health Care*, 32(3), 230-250.
- Lee, J. H. (2019). A study on the revitalization of virtual reality-based education. *J. Korean Soc. Des. Cul.*, 25, 357–366.
- Li, N. L., & Kim, M. J. (2020). A Critical Review of Smart Residential Environments for Older Adults With a Focus on Pleasurable Experience. *Frontiers in Psychology*.
- Lindsay et al., (2024). Accessible independent housing for people with disabilities: A scoping review of promising practices, policies and interventions. *Plos one*, 19(1), e0291228.
- Liu, C. J., & Chang, M. C. (2020). Interventions within the scope of occupational therapy practice to improve performance of daily activities for older adults with low vision: A systematic review. *The American Journal of Occupational Therapy*, 74(1), 7401185010p1-7401185010p18.
- Malkawi, S. H., Alqatarneh, N. S., & Fehringer, E. K. (2020). The Influence of Culture on Occupational Therapy Practice in Jordan. Volume 2020. Article ID 1092805.
- Mann, K., Ottenbacher, M., and Fraas, (2022). Systematic review of the effect of home modification and fall prevention programs on falls and the performance of

- community-dwelling older adults. *The American Journal of Occupational Therapy*, 66(3), 284-291.
- Marchi, L., & Gaspari, J. (2023). Energy Conservation at Home: A Critical Review on the Role of End-User Behaviour. *Energies*, 16, 7596.
- McLaren, C. D., & Bruner, M. W. (2022). Citation network analysis. *International Review of Sport and Exercise Psychology*, 15(1).
- Moncada, L. V. V., & Mire, L. G. (2017). Preventing falls in older persons. *American Family Physician*, 96(4), 240-247. PMID: 28925664.
- Moore Jr., J. A., & Pubantz, J. (2022). *The New United Nations: International Organization in the Twenty-First Century* (3rd ed.). Routledge.
- Mortenson et al., (2019). Exploring the Sustainability of Home Modifications and Adaptations in Occupational Therapy. *Canadian Journal of Occupational Therapy*, 00084174231222310
- Mukaino et al., (2020). Development and assessment of a home environment checklist to evaluate mismatch between patients' ability and home environment. *Annals of Physical and Rehabilitation Medicine*, 63(4), 288-295.
- Nanavati, A., Ranganeni, V., & Cakmak, M. (2023). Physically Assistive Robots: A Systematic Review of Mobile and Manipulator Robots That Physically Assist People with Disabilities. *Annual Review of Control, Robotics, and Autonomous Systems*.
- Oaks, M. (2017). The Importance of Home Modification for Occupational Participation and Safety for Low-income Older Adult Homeowners. Occupational Therapy Department, Hamad Medical Corporation. (2019). *Occupational Therapy Reflections*, Volume 1, No. 1.
- Oladejo, M. T. (2020). Tradition of Concubine Holding in Hausa Society (Nigeria), 1900-1930. *AFRREV IJAH: An International Journal of Arts and Humanities*, 9(1), 118-129.
- Optimal Living Therapy. (2021). How occupational therapists assess and provide complex home modifications. [Accessed 18th January 2022] Available from World Wide Web: <https://optimaltherapy.com.au/how-occupational-therapists-assess-and-provide-complex-home-modifications/>
- Patry et al., (2019). Psychometric properties of home accessibility assessment tools: A systematic review. *Canadian Journal of Occupational Therapy—Revue Canadienne D Ergotherapie*, 86(3), 172–184.
- Peace, S., & Darton, R. (2020). Reflections on cross-cultural comparison of the impact of housing modification/adaptation* for supporting older people at home: A discussion. *Journal of Aging and Environment*, 34(2), 210-231.
- Peninsula News, (2018). QRI facility helps patients lead an independent life [Accessed 18th January 2022] Available from World Wide Web: <https://thepeninsulaqatar.com/article/11/01/2018/QRI-facility-helps-patients-lead-an-independent-life>
- Peninsula News, (2022). Legacy of Qatar 2022 discussed at accessibility forum [Accessed 18th January 2023] Available from World Wide Web: <https://thepeninsulaqatar.com/article/09/11/2022/legacy-of-qatar-2022-discussed-at-accessibility-forum>
- Peninsula News, (2023). Forum to show healthcare advancements in Qatar, region [Accessed 11th January 2024] Available from World Wide Web: <https://thepeninsulaqatar.com/article/29/12/2023/forum-to-show-healthcare-advancements-in-qatar-region>

- Peninsula News, (2023). Qatar committed to health for all [Accessed 18th December 2023] Available from World Wide Web: <https://thepeninsulaqatar.com/article/07/04/2023/qatar-committed-to-health-for-all>
- Preto, A. (2020). A study on accessibility in an Old Italian City: when the past is worth. *Disability and Society*, 37(3).
- Romano et al., (2019). A review on animal–robot interaction: from bio-hybrid organisms to mixed societies. *Biological cybernetics*, 113, 201-225.
- Russell, R., Ormerod, M., & Newton, R. (2018). The Development of a Design and Construction Process Protocol to Support the Home Modification Process Delivered by Occupational Therapists. *Journal of Aging Research*, Volume 2018, Article ID 4904379.
- Shekelle, P. (2022). Overview of clinical practice guidelines. UCLA Medical School [Accessed 18th January 2023] Available from World Wide Web: <https://www.uptodate.com/contents/overview-of-clinical-practice-guidelines>.
- Shirley Ryan Ability Lab. (2023). Occupational Therapist's Guide to Home Modification [Accessed 18th December 2023] Available from World Wide Web: <https://www.sralab.org/lifecenter/resources/occupational-therapists-guide-home-modification-practice-0>
- Shoib et al, (2022). Performance of academic staff during COVID-19 pandemic-induced work transformations: An IPO model for stress management. *Economies*, 10, 51.
- Somerville et al., (2020). A mobile app directory of occupational therapists who provide home modifications: development and preliminary usability evaluation. *JMIR rehabilitation and assistive technologies*, 7(1), e14465.
- Stark M., Sheth, S., & Cogle, C. R. (2022). Home modifications for older adults: A systematic review. *Journal of Applied Gerontology*, 42(5), 1151-1164.
- Stark, S., & Keglovits, M. (2017). Home modifications occupational therapists recommend most frequently for clients with dementia. *Physical & Occupational Therapy in Geriatrics*, 35(3-4), 179-193.
- Stark, S., & Landerman, L. R. (2017). The relationship between home modifications and occupational therapy among persons with multiple sclerosis. *Disability and Rehabilitation: Assistive Technology*, 12(7), 726-732.
- Stark et al., (2017). Effect of Home Modification Interventions on the Participation of Community-Dwelling Adults With Health Conditions: A Systematic Review. *American Journal of Occupational Therapy*, 71(2), 7102290010p1-7102290010p11.
- Stark et al., (2018). Feasibility Trial of Tailored Home Modifications: Process Outcomes. *American Journal of Occupational Therapy*, 72(1), 7201205020p1-7201205020p10. <https://doi.org/10.5014/ajot.2018.021774>
- Struckmeyer et al., (2020). Home Modification Assessments for Accessibility and Aesthetics: A Rapid Review. *Health Environments Research & Design Journal*.
- Syaodih, E., & Aprilesti, L. P. (2019). Disability-friendly public space performance. *IOP Conf. Ser.: Mater. Sci. Eng.* 830 022028. DOI 10.1088/1757-899X/830/2/022028
- Turja et al., (2020). Robot acceptance model for care (RAM-care): A principled approach to the intention to use care robots. *Information & Management*, 57(5), 103220.
- United Nations, (2022). United Nations Convention on the Rights of Persons with Disabilities [Accessed 18th January 2023] Available from World Wide Web: <https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/article-9-accessibility.html>
- United States Department of Housing and Urban Development. (2022). Home Modification: Increasing Accessibility and Safety in Your Home [Accessed 18th January 2023] Available from World Wide Web:

- https://www.hud.gov/sites/dfiles/SPM/documents/FR-6600-N-69_OAHMP_NOFO.pdf
- Van den Brom et al., (2019). Variances in residential heating consumption – Importance of building characteristics and occupants analysed by movers and stayers. *Applied Energy*, 250, 713-728.
- Waisman-Nitzan, M., Schreuer, N., & Gal, E. (2020). Person, environment, and occupation characteristics: What predicts work performance of employees with autism? *Research in Autism Spectrum Disorders*, 78, 101643.
- Waleed et al., (2018). Smart home as a new trend, a simplicity led to revolution. 2018 1st International Scientific Conference of Engineering Sciences - 3rd Scientific Conference of Engineering Science (ISCES), 30-33.
- Waleed et al., (2019). Evaluation of urban environment accessibility for wheelchair users: A case study of downtown areas in Seoul. *Sustainability*, 11(24), 7040.
- Wellecke et al., (2022). Accessible design features and home modifications to improve physical housing accessibility: A mixed-methods survey of occupational therapists. *Disability and Health Journal*, 15(3), 101281.
- Whalley Hammell, K. (2019). Building globally relevant occupational therapy from the strength of our diversity. *World Federation of Occupational Therapists Bulletin*, 75(1), 13-26.
- World Federation of Occupational Therapists. (2018). Position Statement: Occupational Therapy and Home Modifications. [Accessed 18th January 2023] Available from World Wide Web: <https://www.wfot.org/resources/occupational-therapy-and-home-modifications>.
- World Federation of Occupational Therapists. (2019). WFOT Minimum Standards for the Education of Occupational Therapists (revised). [Accessed 18th January 2023] Available from World Wide Web: <https://www.wfot.org/resources/minimum-standards-for-the-education-of-occupational-therapists-2019>.
- World Health Organization. (2023). Rehabilitation. [Accessed 18th December 2023] Available from World Wide Web: <https://www.who.int/news-room/fact-sheets/detail/rehabilitation>.
- Yardley, S., Worrall, L., & Simmons-Mackie, N. (2020). Technology and its role in rehabilitation for people with aphasia: A systematic review. *Journal of Speech, Language, and Hearing Research*, 63(12), 4812-4830.
- Zahedi, N. (2023). Socio-Cultural Challenges to Women's Solo Domestic Travel Pursuits: A Mini-Ethnographic Case of Iranian Culture. [Accessed 18th December 2023] Available from World Wide Web: <http://hdl.handle.net/10464/17743>.
- Zingaro et al., (2019). Assessment of the German and Italian stress cardiomyopathy score for risk stratification for in-hospital complications in patients with Takotsubo syndrome. *JAMA cardiology*, 4(9), 892-899. (2019)
- Zingaro, S. (2019). The impact of home modifications on the performance of daily activities for individuals with disabilities: A systematic review. *Disability and Rehabilitation: Assistive Technology*, 14(4), 349-358.