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RESEARCH ARTICLE

The Effect of Green Products and Interior Design on Physically Disabled People's Quality of Life in Jordan

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ABSTRACT

Individuals with disabilities in Jordan face significant challenges, especially in employment, education, and access to public spaces and information. Economic conditions for these individuals are poor due to high unemployment rates and insufficient social support, exacerbated by the absence of a robust welfare system and eco-friendly designs. This study investigates how interior design and green products can improve the quality of life (QoL) for physically disabled people in Jordan. Using a quantitative, cross-sectional approach with self-administered questionnaires, the study surveyed 386 disabled individuals, employing Structural Equation Modeling (SEM) for analysis. Results show that both interior design (β=0.630, $p<0.001$) and green products (β=0.270, $p<0.001$) significantly impact QoL. However, no significant correlation was found between interior design and green products themselves. The findings provide insights for enhancing the QoL for physically disabled people and offer recommendations for policymakers to develop supportive programs and initiatives.

1. INTRODUCTION

Jordan has attracted global attention in recent decades due to its rapid socio-economic development alongside persistent socio-economic challenges. A pivotal moment came in the late 1980s when Jordan faced a severe economic crisis, leading to a decline in living standards (UK Aid, 2020). The situation worsened in 1990 when about 300,000 Jordanians returned home after the Gulf War. These returnees, previously economic migrants, increased Jordan's population to over 4 million but simultaneously caused a significant drop in state revenue due to the loss of remittances. The aftermath of the Gulf War further strained Jordan's resources, leading to water shortages, unemployment rates soaring to 20%, and a poverty rate increase to 6.6% (Turmusani & Sime, 2019). As a result, both Jordanian citizens and the country's large refugee population have faced growing economic hardships.

The Gulf War's impact, along with ongoing conflicts in the West Bank, has led to an increase in conflict-related disabilities, especially among refugees. This surge has stretched the capacity of governmental and local authorities to provide adequate support for physically disabled individuals (Acton, 2020; UNICEF, 2019; Turmusani & Sime, 2019). By 2018, disability prevalence in Jordan was estimated to be between 11% and 15%, a significant increase from earlier estimates. Despite comprising only 6% of the population, individuals aged 65 and above showed a disability rate of 13.9%. Additionally, 84% of people with disabilities lived in urban areas (Thompson, 2018). Among children under 18, approximately 500,000 were reported to have disabilities (Jordan Times, 2019).

Disabled individuals in Jordan face numerous challenges, including discrimination and a lack of accessibility in public spaces like streets, schools, and universities (Jordan Times, 2015a). Even when

facilities are accessible, issues related to transportation and mobility are prevalent. To address these challenges, Jordan introduced Law No. 20 in 2017, requiring all public facilities to be fully accessible within ten years. Public transportation and traffic systems must also comply with accessibility standards within five years, and voting stations must be accessible. Despite these legislative efforts, individuals with disabilities, especially refugees, still face significant barriers to fully participating in family and community life, including discrimination and limited accessibility in public transportation.

Jordan lacks sufficient infrastructure to provide assistive technologies for people with physical disabilities. Cultural norms often prioritize males for access to assistive equipment, particularly in households with multiple disabled individuals. This problem is compounded by unmet demand for assistive technologies among disabled Jordanian refugees. While some support services are provided by informal Syrian-run organizations, many have been closed due to suspected links with extremist groups. Concerns over the quality control of available assistive devices further complicate the issue. Humanitarian organizations primarily supply these devices, but mismatches between supply and demand, along with delays, hinder access (Odeh et al., 2021).

The 2020 Global Education Monitoring Report highlights that most schools in Jordan lack the infrastructure to support inclusive education due to inadequate facilities for safe access and transportation (UNESCO, 2020). A 2013 study on faculty attitudes at a major public university in Jordan found that, although many faculty members had positive views towards admitting students with disabilities, most were unaware of disability regulations and were unprepared to teach disabled students (Abu-Hamour, 2013).

The COVID-19 pandemic has further worsened the situation for disabled individuals in Jordan, introducing new risks and restrictions. Limited data suggests that COVID-19 has made it even more challenging for people with disabilities to access medical care, rehabilitation services, and social support programs. Despite increased efforts to promote accessibility, the lack of essential infrastructure still limits the use of assistive technology and participation in society for disabled individuals (Dupire, 2018).

Recent studies indicate that disabled individuals in Jordan face significant disadvantages in employment, education, and training opportunities (Hinchcliffe, 2019; Khatib, 2018). Public institutions, transportation systems, and religious facilities often lack inclusive designs, which exclude many disabled individuals (Zomu't, 2019). There is also a severe shortage of accessible information and resources for disabled people (Jordan Times, 2019).

The economic outlook for disabled individuals in Jordan is concerning. According to UNESCO reports, the current employment and social support systems are insufficient. The Centre for Strategic Studies estimates that Jordan's general unemployment rate is between 22% and 27% (Hinchcliffe, 2019). Unemployment rates among disabled individuals are perceived to be even higher, and poverty is more prevalent in this group. The absence of a robust welfare system, along with the lack of eco-friendly materials and proper interior design, exacerbates inequalities and hampers efforts to improve the quality of life for disabled individuals (Jordan Times, 2019).

Support for disabled individuals is constrained by a lack of specialized centers, trained personnel, and essential resources. The Queen Alia Fund, a government initiative, aims to support disabled individuals living in their own homes by providing modifications such as accessible bathrooms and ramps. However, support from both governmental and non-governmental organizations remains insufficient for those seeking to live independently within the community (Dalley, 2020).

Socio-cultural attitudes towards disabled individuals in Jordan are mixed. Some Islamic teachings advocate for equal rights for people with disabilities, as seen in a Quranic story where Allah rebukes the Prophet for neglecting a blind man seeking guidance (Ali, 1994: Surah Abasah, verses 1-5; see Miles, 1995). However, societal perceptions often view disabled individuals as a financial burden and a source of social stigma. Media portrayals frequently depict disabled individuals as dependent and vulnerable, reinforcing negative stereotypes (Khatib, 2018).

Given these challenges, this study aims to explore how interior design and green products can improve the quality of life for physically disabled individuals in Jordan. By doing so, it seeks to

contribute to the existing body of knowledge and offer valuable insights for supporting this population.

While there is extensive research on interior design, green products, and quality of life (QoL), there is a noticeable lack of focus on their impact on physically disabled individuals in Jordan. Some studies have examined how contemporary housing design affects QoL, but these are often fragmented and conducted outside the Jordanian context (Hoque et al., 2016; Pena et al., 2022). Moreover, previous research has not adequately addressed the specific needs of disabled individuals, particularly in developing regions like Jordan (Kakeeto, 2012; Montoo, 2006; Harwood & Garry, 2006; Hultman & Shaw, 2003).

A review by Hoque, Awang, and Salam (2017) points out the lack of research on the role of modern interior design and green products in enhancing QoL for physically disabled individuals in Jordan. Most existing studies are outdated, conducted over a decade ago, and do not reflect current advancements in design or changes in socio-economic conditions (Ankomah et al., 2021). As Pena et al. (2022) argue, globalization, technological advancements, and evolving design practices necessitate updated research to accurately reflect present conditions.

Researchers like Hoque et al. (2016), Simpson et al. (2006), and Hultman and Shaw (2003) have highlighted the lack of empirical studies on the role of interior design and green products in improving QoL for disabled individuals. This gap limits policymakers' ability to develop effective strategies and hampers efforts to enhance the QoL for physically disabled individuals in Jordan. Thus, this study aims to investigate the impact of interior design in modern homes and the use of green products on the QoL of physically disabled individuals in Jordan, using quantitative research methods.

Kakeeto (2012) noted that interior design and green product concepts originating in Western contexts may not be universally applicable, particularly in socio-cultural settings like Jordan. Empirical evidence suggests that design approaches should be contextually tailored, as demonstrated by Hanmaikyur (2016) and Kakeeto (2012). This study seeks to address these gaps, offering context-specific insights to inform future research and practical applications.

2. LITERATURE REVIEW

2.1 Quality of life (QOL)

Quality of Life (QOL) is a multifaceted concept that has been the focus of numerous philosophical, social, and scientific investigations. The primary goal of QOL studies is to enhance people's living standards and overall well-being, which is a central objective of various socioeconomic development strategies, including those of governments like Jordan's (Rueviius, 2018). Despite its importance, a universally accepted definition of QOL does not exist due to varying cultural, social, and developmental perspectives. There are three primary philosophical approaches to understanding QOL:

1. Normative notions: These are based on religious, philosophical, or societal norms that dictate what constitutes a good life.

2. Preference satisfaction: This approach focuses on fulfilling individual needs and preferences, emphasizing the role of resource availability in shaping life quality.

3. Personal experience: This is based on an individual’s subjective experiences and feelings of happiness, pleasure, and satisfaction with life.

QOL is often debated in terms of whether it should be measured subjectively (based on personal feelings and experiences) or objectively (based on measurable factors such as income, health status, etc.). Subjective measures focus on an individual's personal assessment of their life circumstances, whereas objective measures look at quantifiable elements like health, social relationships, and economic status. Both perspectives are necessary to gain a holistic understanding of QOL.

QOL is inherently multidimensional, involving various facets such as physical health, mental well-being, social interactions, and environmental factors. Scholars argue that evaluating QOL based on a single factor is insufficient due to its complex nature (Shin, 2019). It includes both subjective and

objective elements, making it a construct that requires a comprehensive approach for accurate measurement. Additionally, individual values and cultural contexts play significant roles in determining what constitutes a high quality of life (Gilgeous, 2018).

Accurately assessing QOL is critical for informing policies and interventions aimed at improving people's lives. Quality of life assessments influence governance, education, healthcare, and social services, as these sectors strive to enhance well-being. Researchers face challenges in defining and measuring QOL due to its varied constructs, which include life satisfaction, psychological well-being, social relationships, and functional abilities (Katschnig, 2006).

While QOL encompasses a broad range of life aspects, HR-QOL specifically focuses on the impact of health and medical conditions on an individual's overall well-being. It's important to distinguish between the two, as HR-QOL is often used in medical research to understand how diseases, treatments, and health policies affect patients' lives. Both subjective assessments (such as self-reported health status) and objective measures (like physical health indicators) are essential for a complete understanding of HR-QOL.

Understanding QOL is complicated by the use of factor analysis and other statistical methods that may not fully capture the complex relationships between various QOL indicators. Researchers argue for the use of advanced statistical techniques, such as structural equation modeling, to accurately represent both cause and effect indicators of QOL. This distinction is crucial in understanding how different factors like health conditions and social relationships interact to shape overall life quality (Fayers & Hand, 1997).

Various scholars have proposed definitions that reflect the complexity of QOL. Lawton's (1983) definition includes behavioral competence, psychological well-being, perceived quality of life, and the objective environment. Katschnig (1997) offers a more detailed definition, incorporating aspects like life satisfaction, social and emotional functioning, and standard of living. The World Health Organization (WHO) defines QOL as an individual's perception of their position in life within the context of culture, value systems, personal goals, expectations, and concerns (Harper & Power, 1998).

QOL research often distinguishes between subjective and objective components. Subjective aspects include personal satisfaction and happiness, which are based on individual cognitive judgments. Objective aspects involve measurable factors such as income, physical health, and social ties. Research indicates that subjective perceptions, such as happiness and life satisfaction, are stronger predictors of QOL than objective indicators like socioeconomic status or education level (Haas, 1999).

Organizations play a significant role in influencing QOL by impacting communities, employees, and broader societal standards. Employment quality, working conditions, and organizational support are critical factors that affect employees' mental and physical health, job satisfaction, and overall life quality. Stressors such as workload, job insecurity, and poor work-life balance can negatively impact QOL. Therefore, organizations that prioritize employee well-being and create supportive work environments contribute positively to the quality of life.

Evaluating QOL requires considering both objective and subjective indicators. The "spillover theory" suggests that satisfaction in one area of life can influence satisfaction in other areas. For example, satisfaction with work life can enhance overall life satisfaction, while dissatisfaction in one domain can be compensated by higher satisfaction in another. Comprehensive QOL assessments should integrate both subjective well-being and objective life conditions to provide a complete picture of an individual's life quality (Sirgy et al., 2003).

Quality of life is a complex, multidimensional concept that requires both subjective and objective evaluation methods to be fully understood. Despite the lack of a universally accepted definition, QOL remains a vital measure for guiding policies and practices aimed at improving human well-being. Recognizing the interplay of individual experiences, cultural contexts, and measurable life conditions is crucial for developing effective strategies to enhance QOL across different populations. As research continues to evolve, the focus should remain on integrating various perspectives and methodologies to capture the true essence of what it means to live a quality life.

2.2 Interior design

Interior design involves creating functional, aesthetically pleasing spaces that enhance the quality of life for their occupants. Defined by Gaing and Nguyen (2017), it is the holistic consideration of how individuals use and enjoy the spaces they occupy. The process includes identifying problems, developing solutions, and implementing these solutions to improve the experience of a physical space. The National Council for Interior Design Qualification (NCIDQ) recognizes interior design as the art and science of understanding human behavior to create functional and enjoyable spaces (El-Zeiny, 2013).

Well-designed interiors can significantly enhance efficiency, comfort, and productivity, directly impacting the quality of life and job performance (Kamarulzaman et al., 2011). A thoughtfully designed environment fosters positive emotions, boosts motivation, and can improve organizational success (El-Zeiny, 2013). Conversely, poorly designed spaces are linked to lower performance levels and decreased quality of life.

Gaing and Nguyen (2017), along with other scholars, have identified key elements of interior design that impact both job performance and personal well-being. These elements include layout, furniture, comfort, cleanliness, privacy, natural and artificial lighting, acoustics, temperature, humidity, color schemes, ventilation, and the inclusion of natural elements like plants and water features. Mustafa (2017) further expands on this by introducing concepts such as thermal comfort, indoor air quality, security, and acoustic and visual comfort as components of Interior Environmental Quality (IEQ).

Modern interior design, as understood today, began to take shape in the 1960s with increased responsibility for public health, safety, and welfare (Poldma, 2008; Plunkett, 2013). Initially focused on aesthetic concerns, modern interior design now integrates functionality, sustainability, and user well-being. This shift is evident in how design has evolved from luxurious palaces and cathedrals to functional public amenities and residential spaces.

Interior design plays a crucial role in accommodating the needs of all individuals, including those with disabilities. There is a growing recognition of the need for inclusive designs that cater to people with physical and mental disabilities. However, cultural perspectives and societal attitudes toward disabilities vary. For instance, in some Arab societies, including Jordan, disabilities may still be viewed with stigma, influencing how public spaces are designed and who they are designed for (Florian & Katz, 2020).

Interior design transcends physical attributes, impacting emotional and psychological well-being. This is achieved by creating environments that elicit positive emotions, provide comfort, and cater to individual needs and cultural traditions. The emotional aspect of design emphasizes the importance of creating spaces that are not only functional but also resonate on a personal level with their users.

Both natural and artificial elements are vital in interior design. Natural materials like wood, stone, and brick provide aesthetic appeal and a connection to nature, which can enhance occupants' well-being. For instance, wood's characteristics, influenced by geographic location, climate, and soil, make it a versatile and preferred material in design. Similarly, the thoughtful use of light—both natural and artificial—plays a crucial role in how spaces are perceived and utilized. Natural light, including sunlight and daylight, is essential for shaping and defining spaces, while artificial lighting helps create specific moods and atmospheres (Coles & House, 2007).

Color is a critical design element that influences mood, perception of space, and overall aesthetics. Colors can make spaces feel larger, more intimate, warmer, or cooler depending on their hue, intensity, and value. Lighting complements color by enhancing visual comfort, guiding perception, and highlighting design features (Oberfeld, Hecht, & Gamer, 2010). Effective use of natural and artificial lighting can create vibrant, inviting spaces and is essential for meeting the visual needs of occupants (Kilmer & Kilmer, 1992).

The arrangement of furniture in a space affects the flow of movement and interaction, influencing social dynamics and the functionality of the environment. For example, living room furniture arrangement can reflect the family's personality and facilitate communication with guests (Mitton & Nystuen, 2007). Materials used in interior design, such as wood, bricks, and natural stone, contribute

to the overall aesthetic and tactile experience of the space. Each material has distinct properties and can be used in its natural or modified form to suit specific design needs.

Interior design must cater to a diverse range of needs, considering factors such as cultural preferences, accessibility, and psychological comfort. Designers are encouraged to adopt inclusive practices that consider the needs of individuals with disabilities, promote emotional well-being, and respect cultural differences. This holistic approach ensures that spaces are not only functional but also inclusive, comfortable, and reflective of the users' identities and lifestyles.

Interior design significantly influences human behavior, productivity, and quality of life by shaping the environments where people live, work, and interact. It combines technical skills, creativity, and an understanding of human behavior to create spaces that are both functional and aesthetically pleasing. The evolving field of interior design now emphasizes sustainability, inclusivity, and emotional well-being, reflecting a broader understanding of what it means to create meaningful and impactful spaces. Through careful consideration of elements such as color, light, materials, and spatial arrangement, interior design enhances the everyday experiences of individuals and contributes to their overall well-being.

2.3 Green products

The interest in green products has significantly increased, driven by various factors such as heightened consumer demand (Chen, 2008), increased supply from companies (Chung and Wee, 2008), and the role of non-governmental organizations, educational institutions, and researchers (Nyborg et al., 2019; Hartman and Ibanez, 2016). Studies reveal that a considerable percentage of consumers, especially in technologically advanced nations, prefer green products, with 34% of clients globally and 30% of Americans adopting environmentally friendly lifestyles (Cohn & Wolfe: 2017, 2019).

Even amidst economic challenges, a large proportion of consumers in North America continue to purchase green products, suggesting a sustained commitment to environmental responsibility (Ecomarkets, 2009). The supply of green products has similarly seen growth, with a marked increase in the variety and availability of these items in North American markets. For instance, the market for green household cleaning products in the U.S. grew from $17.7 million to $64.5 million in 2008 (Athavaley, 2009).

Green products are generally characterized by their sustainability, non-toxicity, and use of recyclable materials, though no product is entirely eco-friendly due to inherent resource use and waste generation (Albino et al., 2019). Definitions of green products vary across research fields, focusing on aspects like environmental impact, production methods, and lifecycle analysis. Despite the lack of a standardized definition, a common understanding is that green products minimize environmental damage through sustainable design and use of renewable or biodegradable materials (Chen et al., 2016; Eichner et al., 2018).

In line with social psychology theories like the Theory of Reasoned Action, attitudes significantly influence the use of green products. Positive consumer attitudes toward green products are prevalent in both developed and developing countries, boosting the use of these products as they are perceived to reduce environmental harm (Arli et al., 2018; Choi & Johnson, 2019). However, studies have also noted a "Green Gap"—a discrepancy between favorable attitudes and actual use—often attributed to factors like low availability and concerns about product effectiveness (Joshi and Rahman, 2015; Nguyen, Nguyen & Hoang, 2019).

The impact of consumer attitudes on green product use varies by context and methodology. For example, mixed results have been observed in studies using different sample groups and statistical approaches, ranging from Structural Equation Modeling to Multiple Regression Analysis (Arli et al., 2018; Hossain & Lim, 2016). Variations in research settings and sample diversity highlight the need for careful consideration when studying consumer behavior towards green products.

Green products play a crucial role in enhancing quality of life and ensuring environmental sustainability. The Norwegian Ministry of Environment's concept of Sustainable Consumption emphasizes using products essential for life while minimizing environmental impact (Paul et al.,

2016). The adoption of green building materials is increasing, driven by the need to mitigate global warming and other environmental concerns, suggesting that green products are a vital aspect of sustainable development (Sun & Zhang, 2019).

Green marketing strategies emphasize environmental protection and health, appealing to consumers' concerns about pollution, climate change, and resource depletion (Ottman, 2017). The construction industry, in particular, has seen a shift towards green building materials, which offer economic, ecological, and social benefits (Dos Santos and Monteiro, 2004). As consumer awareness grows, so does the demand for certified green products that meet health and environmental standards (De Fatima Cardoso et al., 2015).

The growing interest in green products reflects a global movement towards sustainability. While consumer attitudes are generally positive, the actual adoption of green products varies due to factors such as availability, product effectiveness, and economic considerations. The ongoing shift towards sustainable consumption and green building practices underscores the critical role of green products in enhancing quality of life and environmental protection.

2.4 The effect of interior design of modern house on quality of life of physically disable people

The importance of decent housing and effective interior design in enhancing quality of life (QOL) has long been acknowledged. There is growing evidence that well-designed home interiors can significantly improve individual well-being. According to the World Health Organization (WHO), improved housing conditions play a crucial role in enhancing people's well-being in both developed and developing countries. People spend over 60% of their time at home, a figure that is even higher among the elderly. Numerous studies have examined the importance of interior design and its impact on quality of life. However, due to the complexity and diversity of what constitutes good home design, these studies have approached the subject from various perspectives.

Quality of Life (QOL) is fundamentally defined as "the degree to which an individual's life experience aligns with their desires and needs, both physical and psychological" (Rice, 1984). The WHO describes QOL as "a person's perception of their position in life, relative to their goals, expectations, standards, and concerns, within the context of their culture and value system" (WHO, 1994). Quality of life is a holistic concept, shaped by various domains such as employment, family, housing, neighborhood, religion, and social networks (Rice et al., 1985). The quality of each domain can be assessed individually, and it varies depending on activities, settings, social roles, relationships, cultural norms, and personal goals. For people with disabilities, the perception of quality of life is closely tied to how well their specific needs and goals are met in these domains (Rice, 1984).

Understanding the needs of people with physical disabilities is crucial for grasping the concept of quality of life. Environmental psychology examines how different aspects of the physical environment either meet or fail to meet the needs of disabled individuals. Since Maslow's hierarchy of needs (1954), human needs have been categorized in various ways, ranging from basic physiological needs to safety, esteem, love, and self-actualization. For people with disabilities, their quality of life improves when more of these needs are met. The discussion of needs also extends to the built environment: the more an environment satisfies the needs of its inhabitants, the more effective it is considered to be (Damain, 2017).

Poorly designed housing can drain time and energy from disabled individuals, reducing their ability to work and engage in other productive activities (Vischer, 2008). Furthermore, negative effects such as health issues—including lung infections, eye strain, and musculoskeletal problems—can arise from poorly designed living environments. The stress associated with unattractive or unsupportive physical surroundings can lead to poor work performance, low morale, reduced motivation, high turnover, and overall decreased productivity (Vischer, 2008; Haynes, 2007; Heerwagen et al., 2004; Sundstrom et al., 1994).

Conversely, studies have shown that living in a home where environmental factors such as lighting, temperature, sound levels, furniture comfort, aesthetics, and architectural details are appropriately managed can have a positive impact on the morale and productivity of disabled individuals (McCoy and Evans, 2005; Vischer and Fischer, 2005; Damain, 2004; Brill and Weideman, 2001; Fisk, 2000; Monk, 1997).

The setup of a room and the choice of furnishings significantly influence quality of life. The (often negative) impact of open-plan interior design has been discussed in various studies and media outlets (Konnikova, 2014; Rashid and Zimring, 2008). Despite criticism, open-plan design, which dates back to the 1940s, refers to workstations arranged in a spacious layout with minimal partitions. Modern home designs feature various open and semi-enclosed layouts, influenced by cultural values and the preferences of the inhabitants. Based on empirical findings, it is expected that the interior design of modern homes can significantly impact the quality of life for individuals with physical disabilities.

2.5 The effect of green product on quality of life of physically disable people

To support environmental preservation, increasing green consumption through green technology provides valuable opportunities to promote eco-friendly products (Boini and Oppenheim, 2008). It is essential for consumers and communities to prioritize environmental safety when making decisions about green product usage (Chen and Peng, 2012). The trend toward green product consumption is expected to enhance people's quality of life while also ensuring environmental sustainability (Dangelico and Pujari, 2010). Global warming exemplifies the harm being inflicted on the environment, and the international community is increasingly focusing on sustainability as a major concern.

As a crucial element in addressing ecological crises, there is a growing recognition of humanity's responsibility to mitigate environmental damage (Sun & Zhang, 2019). The global population, which surpassed one billion in the 19th century and six billion in the 20th century, is projected to reach nine billion by 2050. The industrial revolution and mass production have made economic growth and increased consumption more feasible, but these advancements have significantly impacted the environment, leading to climate change, loss of biodiversity, and depletion of both renewable and non-renewable resources. While economies strive to alleviate poverty and improve living standards, poverty and low living standards persist in many countries across Africa, Asia, and Latin America (Reutlinger, 2012).

Growing environmental awareness stems from the belief that human activities are causing ongoing harm to the planet. Green marketers address these concerns by incorporating nostalgic imagery, such as babies, daisies, and planets, into their advertisements. For disabled individuals, awareness of product choices is important, especially when focusing on healthy options. They must integrate organic products into their daily routines and adapt their lifestyles accordingly. Despite the higher cost, many physically disabled people view organic products as beneficial for their health (Pech Lopatta, 2007). Research indicates that health concerns are a major driver for the adoption of green products (Chen, 2009; Haghiri et al., 2009). However, there is limited research on the impact of green products on the quality of life for disabled individuals in the Middle East. Given the existing empirical evidence and literature, it is anticipated that green products will have a significant positive effect on the quality of life for physically disabled people in Jordan.

2.6 Conceptual model

On the proposed model, Interior Design and Green Product used as independent variables or as exogenous construct in this research. On the right side of the model QoL is placed as dependent variables or used as endogenous Construct.

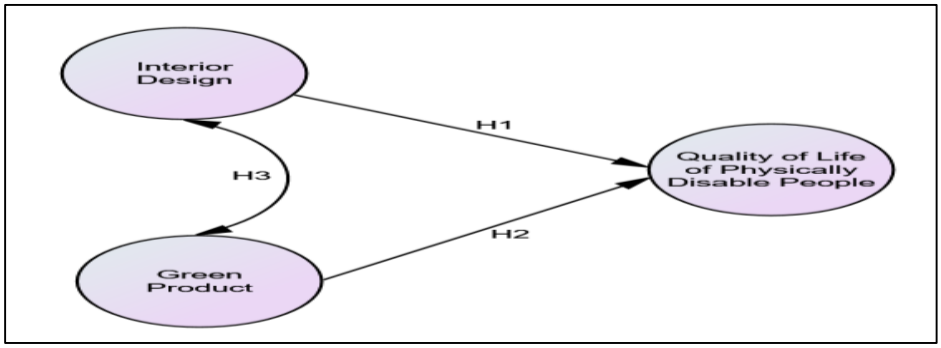

Figure 1: Proposed framework

3. METHODOLOGY

3.1 Data sources and population of the study

The data for this research is primarily sourced to ensure relevance and appropriateness for the study. Primary data is collected through the personal distribution and retrieval of completed surveys from respondents. Primary data refers to evidence gathered specifically for the research at hand (Burns and Bush, 2010). The population for this research comprises physically disabled individuals in Jordan. This selection aligns with the nature of the research and the study constructs. According to Uma and Roger (2013), the population encompasses the entire group of people, events, or phenomena that the researcher aims to study. For this research, the population is approximately 1,100,000 physically disabled individuals in Jordan.

3.2 Research instrument

A self-administered questionnaire with items measured on a seven-point interval scale is used for data collection. The seven-point scale provides respondents with a range of response options suitable for parametric statistical analysis (Awang, 2012; 2014; 2015). The questionnaire measures agreement on a scale from 1 (Strongly Disagree) to 7 (Strongly Agree) and covers several study components: Interior design, Green products and Quality of life of physically disabled individuals. The study adapts and customizes items from Obinwanne et al. (2019), focusing on interior design elements relevant to physically disabled individuals in Jordan. Items from Jan et al. (2019) are adapted for this study to assess green products. The instrument includes twelve items tailored to the context of physically disabled individuals in Jordan, with responses rated from 1 to 7. The quality of life for physically disabled individuals is measured using items adapted from Jenney and Campbell (1997). Eight customized items are used.

3.3 Questionnaire validity

The questionnaire is developed based on existing literature, with modifications to improve clarity and relevance. A pre-test with 15 respondents ensures that the wording and design are appropriate and that any ambiguity is addressed. Face validity is established through pre-test feedback, while content validity is assessed through expert reviews and literature comparison. Construct validity is examined using exploratory factor analysis (EFA) to ensure that survey items align with the intended constructs.

3.4 Scales employed to measure items

Likert scales are commonly used in quantitative research to measure respondents' opinions. A seven-point Likert scale is preferred for its accuracy and freedom of choice, suitable for parametric analysis (Awang, 2015). This scale allows respondents to express their views with greater granularity compared to five-point scales, supporting robust statistical analysis.

3.5 Sample size

The sampling frame is derived from the Jordanian Department of Statistics, national censuses, and diagnostic reports. Determining the optimal sample size involves balancing cost and statistical accuracy. A sample size of 384 is deemed sufficient, consistent with guidelines suggesting 100-500 respondents for generalization (Uma and Roger, 2013) and 200-400 for structural equation modeling (Awang, 2012; 2015; Hair et al., 1998). This aligns with Krejcie and Morgan's (1970) recommendation for populations exceeding one million.

3.6 Method of analysis

Structural Equation Modelling (SEM) is a second generation method of multivariate analysis technique developed to cater limitations in the traditional Ordinary Least Squares (OLS) and the analysis for latent constructs is no longer appropriate with OLS (Hoque et al., 2017a; Hoque et al., 2017c; Afthanorhan et al., 2017; Hoque and Awang, 2016a; Kashif et al., 2016; Awang, 2017b; Awang, 2015; 2014; Awang et al., 2015a). Thus the researchers employed SEM so as to keep pace with the advancement in research methodology. In SEM, the researcher validated the measurement model of a latent construct using the Confirmatory Factor Analysis (CFA) procedure. Once validated, the researcher assembled the constructs into the structural model and execute the SEM procedure.

Consequently, analyzing and testing the theory using IBM-SPSS-AMOS software is fast, efficient and robust (Awang et al., 2017a; Hoque et al., 2017b; Hoque et al., 2017c; Hoque et al., 2017d; Awang et al., 2017b; Hoque and Awang, 2016b; Awang, 2014; 2015). Hence, this study employed IBM-SEM-AMOS software version 25 for analysis and testing the hypothesis.

4. RESULTS OF FACTOR ANALYSIS

4.1 Measurement model

The measurement model, comprises the factor loading of each item for every construct of the model. Figure 2 shows the fitness indexes of the measurement model of this study.

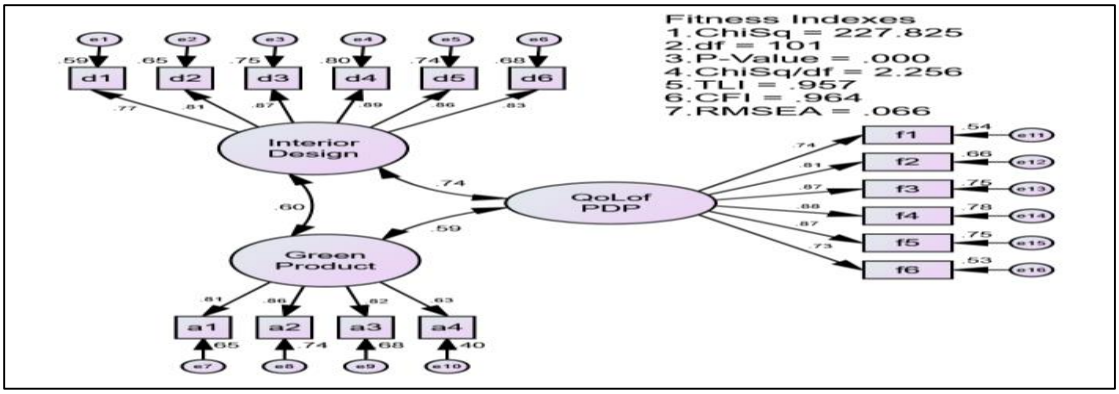

Figure 2: Measurement model with fitness indexes

Figure 2 indicates that the items and factor loading of three constructs that comprise of Intrerior Design, Green Product and Quality of Life of PDP and it also shows that all the items are having factor loading value above the cut-off point of 0.60. Hence, this study achieved the unidimensionalty for the construct and can proceed for further analysis (Awang, 2015; Awang et al. 2015).

Table 1: Achieved fitness indexes of the study

Category Name	Index Name	Index Value	Comment
Absolute fit	RMSEA	**0.066**	Fitness Level Achieved
Incremental fit	CFI TLI	**0.964** **0.957**	Fitness Level Achieved
Parsimonious fit	Chisq/Df	**2.256**	Fitness Level Achieved

Table 1 shows the fitness Indexes of the measurement model. All Fitness Indexes (RMSEA = 0.066, CFI = 0.964, TLI = 0.957 and Chisq/df = 2.256) of the measurement model signifies a satisfactory fit to the data and result of all indexes was good. Hence, this study achieved the construct validity (Awang, 2015; Awang et al. 2015).

Table 2: CFA Result

Construct	Sub-Construct/ Component	Factor Loading	Composite Reliability (CR) (≥0.6)	Average Variance Extracted (AVE) (≥0.5)
Interior Design (ID)	D1	0.77	0.926	0.677
	D2	0.81		
	D3	0.87		
	D4	0.89		
	D5	0.86		
	D6	0.83		
Green Product (GP)	A1	0.81	0.940	0.724
	A2	0.86		
	A3	0.82		
	A4	0.63		
QoL of Physically	F1	0.74	0.882	0.790
	F2	0.81		
	F3	0.87		

Disable People	F4	0.88		
	F5	0.87		
	F6	0.73		

Table 2 displays that CR and AVE for the constructs are achieved since their values are above the threshold of 0.6 and 0.5 respectively. Hence, this study achieved the convergent validity and reliability and can proceed for further analysis as the measurement model is valid and fit (Awang, 2015; Awang et al. 2015).

4.2 Structural Equation Modelling (SEM)

Table 3: Squared multiple correlation (R^2)

Variable	Estimate (R^2)
QoL	**0.586**

The above Table 3 indicates that the predictor of QoL explains 58.6% of its variance. In other arguments, the error variance of QoL is about 41.4% of the variance of QoL.

Table 4: The standardized path coefficient for the model

Construct	Path	Construct	Estimate
QoL	←	Interior Design	0.609
QoL	←	Green Product	0.225

Table further confirmed that the significant beta estimates for the respective constructs. This indicates that ID moves up by 1 standard deviation, QoL moves up by 0.304 standard deviations. Moreover, when GP moves up by 1 standard deviation, QoL moves up by 0.397 standard deviations.

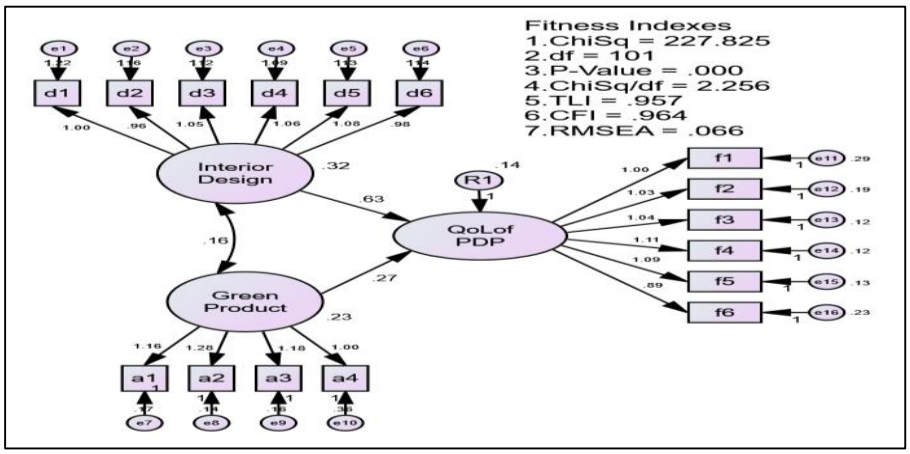

Figure 3: Regression path coefficient

Figure 3 indicates the AMOS output showing the regression coefficient between the constructs. The model also shows a significant beta coefficient of .338 between ID and QoL. Moreover, the model shows a significant beta coefficient of .385 between GP and QoL. The discussion of the implication follows immediately after confirming the beta coefficient in Table 5.

Table 5: Regression weight for path estimate

Construct	Path	Construct	Beta Estimate	SE.	C.R.	P-Value	Result
QoL	←	Interior Design	.630	.075	8.348	.001	Significant
QoL	←	Green Product	.270	.076	3.564	.001	Significant

Note: *** P<0.01

The first hypothesis of this study examined the effect of ID on QoL of physically disable people in Jordan. It was therefore hypothesized that ID has significant effect on QoL of physically disable people in Jordan. The result of the direct effect showed that the hypothesized relationship between ID and QoL of physically disable people in Jordan is statistically significant. The beta estimate in the

relationship between ID and QoL of physically disable people in Jordan is β= .630 with a p-value of 0.001 which is lower than the level of 0.05 as shown in Table 5. This research hypothesis H1 is supported by the data of this study. Thus, the beta coefficient reveals that Interior Design has significant effect on the QoL of physically disable people in Jordan.

Moreover, the second hypothesis of this study examined the effect of GP on the QoL of physically disable people in Jordan. It was hypothesized that GP has a significant effect on the QoL of physically disable people in Jordan. The result reveals that the hypothesized relationship between GP and QoL of physically disable people in Jordan is statistically significant. The beta estimate in the relationship between GP and QoL of physically disable people in Jordan is β=.270 with p-value of .001 which is lower than the level of 0.05 as shown in Table 5. Therefore, the research hypothesis H2 is supported by the data. The study concluded that green product has significant effect on the QoL of physically disable people in Jordan.

Table 6: Testing the result of hypothesis 3 based on the discriminant validity index summary

Construct	Interior design	Green product	QoL of Physically Disable People
Interior Design (ID)	0.816		
Green Product (GP)	0.601	0.850	
QoL of Physically Disable People	0.744	0.167	0.888

According to Awang (2015), the measurement model is free from redundant items or not that can be known from Discriminant Validity. The correlation between exogenous constructs must not exceed 0.85 and if the correlation value surpasses 0.85, the two exogenous constructs are redundant or pose a huge multi-collinearity problem (Awang, 2014, 2015). Table 6 therefore showed the discriminant validity index summary for each latent structure in the study. The bold diagonal value of Interior Design, Green Product and QoL of Physically Disable People is the $\sqrt[2]{AVE}$. The discriminant validity of the constructs is achieved since the correlation value doesn't exceed 0.85, and the diagonal values are larger than those in their rows and columns (Awang, 2015; Awang et al., 2015; & Kashif et al., 2016). Since the diagonal value is higher than any values in its column and row therefore the discriminant validity of the study model is gained and H3 is not supported. The study concluded that by the data of the study, Interior design and green products of the modern houses have not significant correlation.

DISCUSSION AND CONCLUSION

This study explored the impact of interior design and green products on the quality of life (QoL) of physically disabled individuals in Jordan. The findings demonstrate that both interior design (ID) and green products (GP) significantly and directly affect the QoL of this population. These results underscore the importance of considering both elements when aiming to enhance the living conditions and overall well-being of physically disabled people in Jordan. By establishing these relationships, the study contributes to a deeper understanding of how environmental factors can improve QoL for physically disabled individuals. This research tested two hypotheses, both of which were statistically significant and supported by the data. However, a third hypothesis, H3, was not supported. The three hypotheses focused on the relationship between interior design, green products, and the QoL of physically disabled individuals in Jordan. Below is a detailed discussion of each hypothesis:

Hypothesis One posited that interior design has a significant effect on the QoL of physically disabled people in Jordan. The study's results confirmed this, showing a significant direct impact of ID on QoL. Thus, H1 is supported by the data, affirming that improvements in interior design can lead to better quality of life outcomes. The study found that a 1% improvement in interior design could result in a 0.630% enhancement in QoL for physically disabled individuals. These findings align with previous studies conducted by Hoque et al. (2017), Kakeeto (2012), and Sin et al. (2002, 2005), which also noted the positive effects of interior design on individuals' well-being. Consequently, the first research question has been answered, and the first objective of the study has been achieved. Hypothesis Two suggested that green products have a significant effect on the QoL of physically

disabled people in Jordan. The study results confirmed this hypothesis, demonstrating that the use of green products positively impacts QoL. Specifically, a 1% increase in the use of green products could lead to a 0.270% improvement in QoL for the physically disabled. Therefore, H2 is supported, and both the third research question and the third objective of the study have been achieved. This finding is consistent with prior research conducted by Samad et al. (2018), Genc (2017), Maina (2016), Musyoki (2015), and others, which highlighted the beneficial effects of green products on individual and environmental well-being. Hypothesis Three posited a significant correlation between interior design and green products in modern houses in Jordan. However, the study found no significant correlation between these two factors, leading to the rejection of H3. Despite this lack of significant correlation, the study achieved discriminant validity, as indicated by the correlation values not exceeding 0.85 and the diagonal values in the discriminant validity index being larger than those in their corresponding rows and columns (Awang, 2015; Awang et al., 2015; Kashif et al., 2016). These results suggest that, while interior design and green products each individually contribute to QoL, they do not necessarily interact or correlate significantly in the context of modern housing in Jordan.

This study significantly advances our understanding of the impact that interior design and green products have on the quality of life (QoL) of physically disabled individuals in Jordan. By focusing on how these elements can enhance daily living experiences, the research highlights the critical role of thoughtfully designed environments in promoting the well-being, independence, and dignity of people with physical disabilities.

The findings emphasize that living spaces designed with accessibility, sustainability, and aesthetic appeal in mind can greatly improve the QoL of physically disabled individuals. Accessible design ensures that people with physical disabilities can navigate their environments safely and independently, reducing the physical and psychological barriers they may face. Sustainable practices, such as the use of green products, not only benefit the environment but also create healthier living conditions by reducing exposure to harmful substances. Aesthetically pleasing environments, meanwhile, can enhance emotional well-being, providing comfort and a sense of belonging, which are essential for mental health.

To capitalize on these findings, it is imperative to integrate these principles into design practices across various sectors, including residential, commercial, and public spaces. This integration should be supported by robust policies and regulations that mandate accessibility standards and promote the use of sustainable, eco-friendly materials. By doing so, we can create environments that are inclusive, allowing physically disabled individuals to participate fully in society and lead fulfilling lives.

Furthermore, this study underscores the need for ongoing research to continually explore and refine our understanding of the relationship between design and QoL for physically disabled people. Future research should focus on developing new design innovations and sustainable products that cater specifically to the needs of this population. Additionally, collaboration among architects, designers, policymakers, healthcare professionals, and advocacy groups is crucial to ensure that the insights from this study are effectively implemented.

Advocacy efforts should also aim to raise awareness about the importance of inclusive and sustainable design, encouraging widespread adoption and acceptance. By working together, stakeholders can drive meaningful change that not only improves the daily lives of physically disabled individuals but also fosters a society that values diversity and inclusivity. Actually, this study provides a foundation for building a more inclusive and supportive society in Jordan, where the QoL of physically disabled individuals is prioritized through thoughtful design and sustainable practices. By committing to continued research, collaboration, and advocacy, we can ensure that the benefits of these findings are realized, ultimately leading to a better quality of life for physically disabled individuals now and in the future.

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