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Research Article

Customer Attitude Toward Smart Innovation Bed (SiNoBed) Application

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Abstract

Aims: The purpose of this study is to examine and identify factors that influence customer attitudes towards and intention to use Smart Innovation Bed (SiNoBed).

Methods: This type of research is descriptive research with a quantitative approach. Total of 136 valid questionnaires was obtained through online means. The demographic profile of the respondents reflected a balanced representation, with 50% being male and female. mean age of the participants was calculated to be 28.45(SD= 5.778) and 57% of the respondents, identified themselves as individuals employed in the nursing profession.

Results: The findings reveal a significant relationship, indicating that customers who express favorable opinions on attributes such as price, design, quality, and usability tend to show high purchase intentions towards SinoBed. In conclusion this study reveals a significantly positive customer attitude towards the purchase interest in Sinobed.

Conclusions: The study highlights the positive customer attitude towards SinoBed, highlighting the importance of factors like competitive pricing, appealing design, quality, and usability in shaping purchase intentions.

Keywords:
Customer Attitude, Pressure Ulcer, Smart Bed, Stroke

INTRODUCTION

Stroke is a clinical illness characterized by the abrupt onset of neurological impairments that persist for a minimum of 24 hours. This condition is linked to localized abnormalities in the central nervous system and impacts the flow of blood in the brain (1). In terms of financing, stroke is one of the catastrophic diseases with the third largest financing after heart disease and cancer, which is 3.23 trillion rupiah in 2022 (2). Stroke is a prevalent vascular ailment that frequently happens worldwide, including in Indonesia, and commonly leads to several consequences. A common consequence that frequently occurs is the development of pressure ulcers. Stroke patients with persistent impairments can impact their ability to move (3). Prolonged immobilization might result in patients being confined to bed for an extended period. Prolonged immobilization enables the inhibition of specific regions, leading to tissue ischemia and ultimately resulting in the development of pressure ulcers.

Pressure ulcers are a common and severe nursing issue that can greatly contribute to illness and death rates. Pressure ulcers are an infection where continuous external

pressure on bone protrusion damages the skin's normal function and anatomical integrity. If neglected, pressure ulcers can become infected and result in deeper wounds. Pressure ulcers can also emerge from skin stretching and sensitivity, generally in areas of the body where there is inflammation in the bones (4). These symptoms typically accompany stress. The waist, heels, and tail bones are the body parts most at risk. Additionally, pressure ulcers could occur in the elbows, knees, ankle joints, and the back of the shoulder. (5). Pressure ulcers frequently occur in stroke patients as a result of limited mobility, which hinders their ability to change positions for extended periods of time. Early intervention is crucial for the treatment of decubitus sores in stroke patients (6). Pressure ulcers have significant detrimental impacts on patients, including persistent pain, septicemia, alterations in self-esteem, body perception, functional impairment, changes in quality of life, and a financial burden that places demands on the pressure ulcer care system (7). Pressure ulcers may manifest within a span of 72 hours following the application of pressure on the skin. This occurrence is driven by various circumstances such as reduced mobility, lack of physical activity, diminished sensory perception of pressure, inadequate nourishment, low arteriolar pressure, elevated humidity, and friction (8). According to the study findings, pressure ulcers are classified into four stages of severity. Stage 1 is characterized by non-blanchable erythema and mild symptoms, while stage 4 represents the most severe level with complete loss of skin and tissue thickness (9).

Preventive measures to reduce decubitus wounds involve promoting mobilization, which refers to more than just periodically changing positions. It specifically entails facilitating the delivery of oxygen and nutrients to the skin and subcutaneous tissue. (10). When performing nursing acts including mobilization, tilting the patient's body at an angle of 30 degrees,

either to the right or left side, results in the least amount of pressure compared to other tilt positions (11). Such low pressure will impede the progression of pressure ulcers. In light of the aforementioned issues, nurses and families require innovative monitoring solutions. Consequently, researchers have developed a cutting-edge solution in the form of a Smart Innovation Bed (SiNoBed), which incorporates a smart mattress.

SinoBed is an Internet of Things (IoT) integrated bed. SinoBed is designed to prevent the risk of decubitus wounds, this Smart-bed is useful to reduce the number of decubitus wounds. This intelligent bed effectively minimizes the incidence of pressure ulcers, hence contributing to a reduction in healthcare expenses, complications, and mortality rates in stroke patients. Sinobed can change position in 6 movements that is right tilt, left tilt, up and down, knee, head, back and leg movements (12,13). The movement can be set automatically and connected to the SinoBed application. SinoBed is additionally equipped with sensors capable of detecting humidity, temperature, and weight, which may be linked to the application. The factors and forces that persuade customers to make purchases are known as marketing motivation. Both emotional and rational motivations will have an impact on consumers' decisions to purchase a specific product (14). According to Fadhila that the influence of consumer perceptions on purchasing decisions occurs when consumers can see reality outside themselves or globally around them. Customer attitude is a combination of a person's beliefs, feelings, and behavioral intentions towards a business. This perspective are frequently developed as a result of a variety of influences.

The characteristics of the consumer, which are impacted by a number of variables; marketing variables include product design, pricing, promotion, packaging, placement, and distribution. individual characteristics, such as age, gender, income, and education.

psychological aspects, such as reasons for purchasing, opinions about things, and attitudes toward them (15). Situational considerations include the time, social, and physical environments at the time of purchasing. Social elements include family, friends, and social standing. Religion, socioeconomic status, caste, and sub-caste are cultural variables. The most influential is the individual's past experience which plays a huge role in developing and reinforcing certain attitudes. Consumer attitudes basically consist of beliefs about feelings and behavioral intentions towards several objects (16). The purpose of this study is to examine and identify factors that influence customer attitudes towards and intention to use Smart Innovation Bed (SiNoBed).

METHODS

Sinobed Design

SinoBed is an Internet of Things (IoT) integrated bed. SinoBed is specifically engineered to prevent the occurrence of pressure ulcers and falls among those who have suffered a stroke. This intelligent bed effectively minimizes the incidence of pressure ulcers, hence contributing to a reduction in healthcare expenses, complications, and mortality rates in stroke patients. SinoBed is constructed from steel plate that has been fabricated using cutting-edge manufacturing techniques. The mattress is composed of memory foam encased in latex rubber. The mattress is equipped with a waterproof cover made of taslan fabric, which is coated with polyester and cooling material. This cover enhances patient comfort and provides a refreshing sensation while in contact with the mattress. The SinoBed mattress consists of 16 parts that enable six distinct movements, including right tilt, left tilt, vertical adjustment, knee movement, head movement, back movement, and leg movement. The movement of this device can be automated with a motor actuator and can be programmed using the SinoBed application. SinoBed can be operated either through a SmartPhone or via a monitor connected to the bed frame. SinoBed is additionally equipped with sensors capable of detecting humidity, temperature, and weight, which may be linked to the application. SinoBed is equipped with a timer function that can be programmed for a duration of 2 hours. It also has an automated position adjustment feature and provides a reminder 5 minutes before the end of the set period to prompt a change in position. This breakthrough facilitates real-time monitoring of patients or their parents, enabling nurses and families to effectively limit the incidence of pressure ulcers in stroke patients.

Figure 1. Sinobed Design

Research Model

This study was conducted using a cross sectional design. This study was conducted at five home care service in Bandung, Indonesia. Based on the literature review, the researchers have developed a research model for the present study as shown in Figure 2 below. The purpose of the model is to establish the relationship between the attributes of the consumers' attitude towards purchase intention of smart bed in the Bandung, West Java Indonesia.
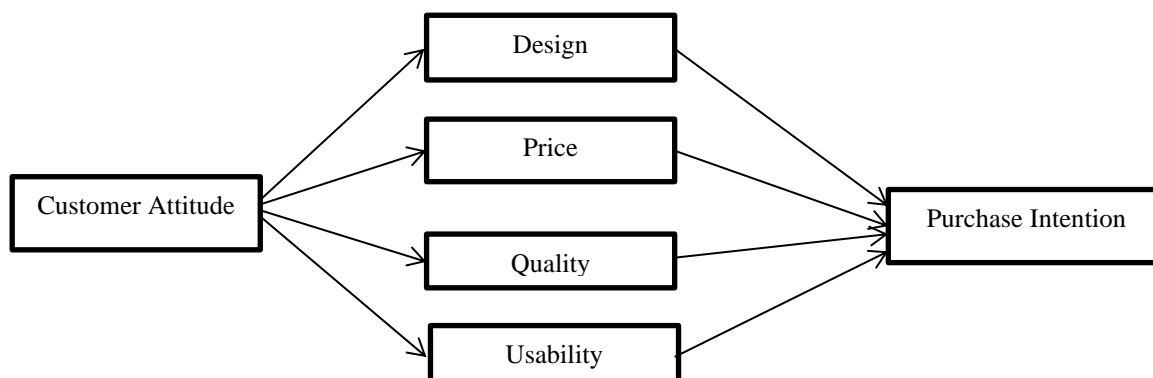
Figure 2. Research Model for Consumer Attitude and Purchase Intention

Study Design

This type of research is descriptive research with a quantitative approach. Descriptive research is a research activity that aims to reveal a problem or situation based on existing facts. While quantitative research is research that uses numbers, starting from data collection, interpretation of data, and appearance of the results.

Sample

The participants of this study were non-regular students at STIKep PPNI West Java who were working as nurses and also families of stroke patients. The inclusion criteria in this study were nurses and families who had experience caring for stroke patients, nurses with a minimum of 1 year of service and willing to become a respondent.

Sample size calculation

Sample size estimation is calculated through G-Power software version 3.1.9.2 using the Exact, correlation point biserial model with the assumption of two tails α = 0.05, Effect size = 0.12 (Cohen, 1988), actual power = 0.8, the total sample size is 136 respondents. Convenience sampling was used to select participants.
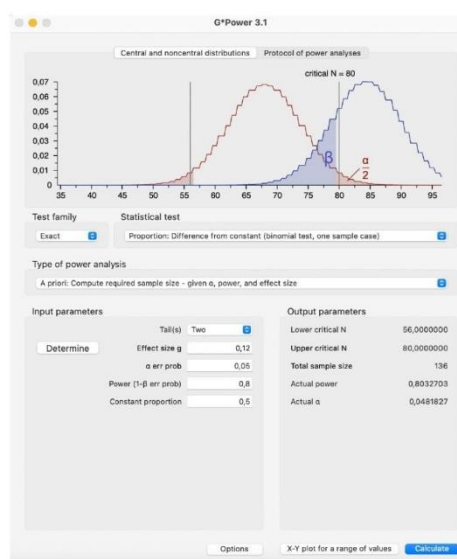
Figure 3. G-Power

Instrument

The instrument in this study uses a customer attitude questionnaire to find out how customers view toward sinobed products. Most of the questions in the instrument were adopted and adapted from previous research. This instrument consists of questions relating to customer attitude factors such as; design, price, quality, usability and purchase intention. To enhance the content validity of the questionnaire, these items were then reviewed by an experts to ensure their appropriateness to the context. Their feedback resulted in several refinements to the instrument; addition, deletion, and repetition of some questions. The Google Form platform is used to create data collection tools, expert sociodemographic data and the Customer Attitude questionnaire, the questionnaire has 40 statement items that use a Guttman scale (1 = disagree, and 2 = agree) with Cronbach's Alpha 0.835.

Procedure

This study can be conducted online or in person. The researcher will ask for willingness to become a respondent through a consent sheet. Afterwards, the researcher will explain the uses and features of Sinobed using a poster, after listening to the presentation, the researcher asked the respondents to fill out a questionnaire that had been prepared in Google Form to assess Sinobed products. Researchers will conduct this research for 1x meeting.

Data analysis

Data analysis conducted in this study is univariate, which aims to show or describe the characteristics of each research variable. This analysis is used to see the frequency distribution of the variables studied in the description of customer attitude in care givers. the results of the analysis produce data on percentage, frequency, mean/mean, standard deviation, minimum and maximum values.

Figure 4. Sinobed Poster

RESULTS

Demographic characteristics

In the conducted study, a comprehensive dataset comprising a total of 136 valid questionnaires was obtained through online means. The demographic profile of the respondents reflected a balanced representation, with 50% being male and female individuals. The mean age of the participants was calculated to be 28.45(SD= 5.778), indicating a relatively homogeneous age distribution within the sample. Furthermore, a noteworthy proportion, accounting for 57% of the respondents, identified themselves as individuals employed in the nursing profession. This demographic information provides a foundational understanding of the diverse composition of the study participants, setting the stage for a nuanced analysis of their responses and insights within the research framework.

Table 1: Demographic characteristics

Variables and category	F (N=136)	%
Gender		
Male	68	50
Female	68	50
Age (Years)		
18-25	47	34.4
26-35	71	52.3
36-40	14	10.2
>40	4	2.8
Respondents		
Nurse	78	57.4
Families with stroke patients	58	42.6

The average Mean value of the four selected factors such as Price, Design, Quality and Usability respectively show that consumers have given preference to these factors (Table 2). In the descriptive analysis of various domains, the mean score within the price domain stands at 9.55 ± 1.04, revealing a narrow range of 5. This observation underscores the substantial impact of pricing considerations on consumers' purchasing decisions. Moving to the design domain, the average score is 11.74 ± 0.63, with a range of 3, indicative of a perceived comfort and aesthetically pleasing design. The quality domain exhibits an average score of 13.85 ± 0.56, with a range of 4, signifying a consensus on the product's commendable quality. Furthermore, the usability domain registers an average score of 19.79 ± 0.71, with a range of 4, affirming a high level of satisfaction with the product's usability. In the realm of purchase intention, the mean score reaches 23.63 ± 1.06, with a range of 6, signifying a robust inclination towards purchasing.

Tabel 2.Consumers' Attitude And Purchase Intention

| Variables	Mean±SD	Range
Price	9.55 ± 1.04	5
Design	11.74 ± 0.63	3
Quality	13.85 ± 0.56	4
Usability	19.79 ± 0.71	4
Purchase Intention	23.63 ± 1.06	6

Figure 2 shows thefrequency distribution of respondents' perspectives on the functionalities of smart beds is presented. Notably, approximately 123.8 of respondents expressed agreement regarding the pricing of smart beds. Furthermore, 127.8 of respondents concurred with the design attributes of these smart bed. The data also revealed 133.1 respondents expressing agreement on the quality and usability of smart beds, and131.8 of respondents concurred with the alignment of smart beds with customer demands.
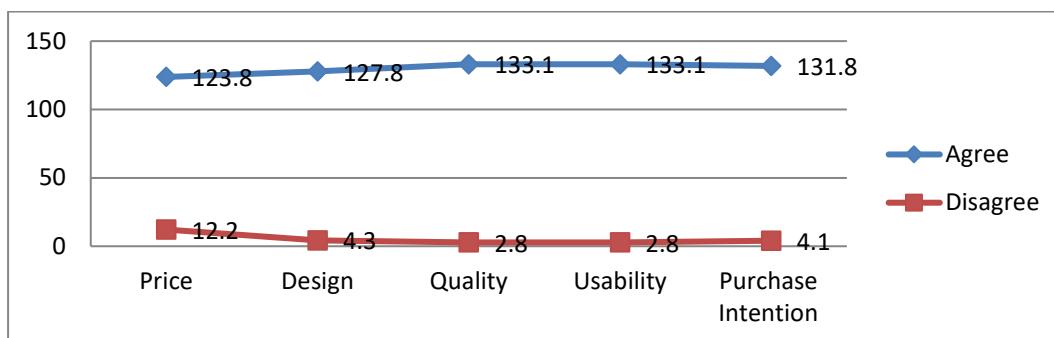
Figure 2. Frequency distribution of respondents' views on smart-bed functions

Table 3 presents a correlation matrix that explains the relationship between consumer attitudes and purchase intentions regarding SinoBed. The findings reveal a significant relationship, indicating that customers who express favorable opinions on attributes such as price, design, quality, and usability tend to show high purchase intentions towards SinoBed. This correlation underscores the interaction of various factors that influence consumer decisions, explaining the important role that perceived price, design aesthetics, product quality, and usability play in shaping potential buyers' overall propensity to engage with and acquire SinoBed.
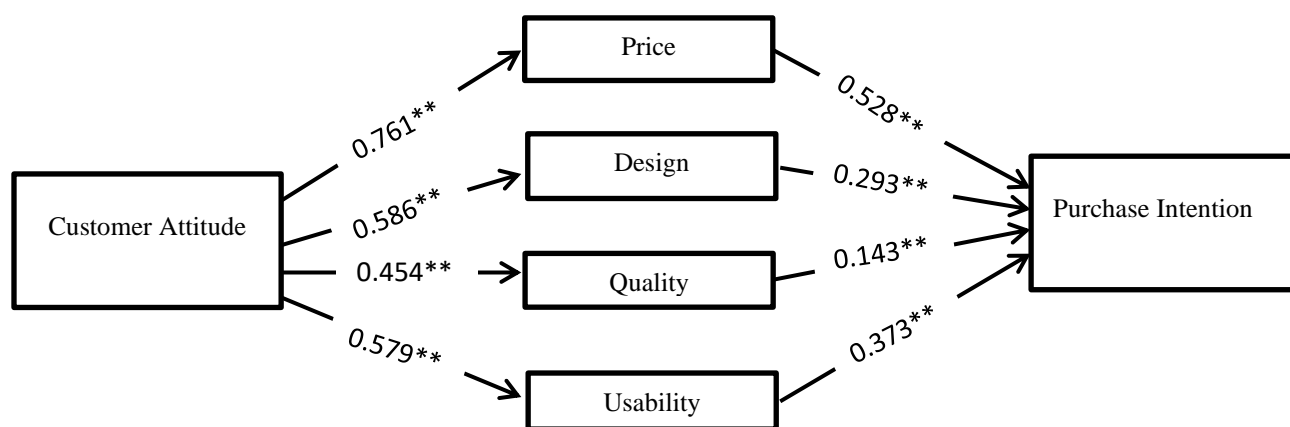
**. Correlation is significant at the 0.01 level (2-tailed).

Tabel 3. Correlation matrix for Consumers' attitude and purchase intention towards SinoBed

DISCUSSION

Based on the results of descriptive analysis of the several domains revealed that the pricing domain had an average score of 9.55 ± 1.04, with a narrow range of 5. 123.8 respondents agreed about the price of smart beds as reflected by a strong correlation (r = 0.761**). This finding highlights the significant impact of price considerations on consumer purchasing decisions. High or low prices can be a major factor in determining purchase intentions. Price-related psychological and economic factors, such as price sensitivity and perceived value, are important in determining how customers and their purchasing intentions interact. As a result, optimizing pricing tactics might be crucial to comprehending and better leveraging market dynamics. This study is in line with previous research results (17) that prices have a significant effect on purchasing decisions.

In the design domain, the mean score was 11.74 ± 0.63, indicating a range of 3. A total of 127.8 respondents expressed agreement with the smart bed's design attributes, as evidenced by a correlation value (r = 0.586**) suggesting perceived comfort and aesthetically pleasing design. Despite this positive reception, interviews revealed suggestions for diversifying sinobeds into full-machine, semi-machine, and manual models to cater to individual needs. This underscores the significant influence of design on consumers' purchasing intentions. Offering various design styles provides consumers with more choices, aligning better with their preferences and requirements. In response to these suggestions, customizing designs into different models emerges as a strategic approach to enhance product appeal and address diverse market segments. This study aligns with prior research findings (18) affirming the positive impact of product design on consumer decisions. The simultaneous influence of product design and purchase intention is underscored, contributing to overall customer satisfaction.

The quality domain featured a mean score of 13.85 ± 0.56, with a range of 4. The consensus among 133.1 respondents, as indicated by the correlation value (r = 0.454**), emphasized commendable product quality. This indicates a significant impact of product quality on consumer perception. The consistently high values and narrow range indicate that consumers consistently prioritize and value product quality, thus shaping their purchase intentions. Key factors such as durability, reliability, and product performance emerged as important considerations in consumers' assessment of quality. By knowing the positive correlation between quality and purchase intention, companies can align their products with consumer expectations. This research is in line with previous research (19) which confirms that product quality has a significant positive influence on purchase intention. A strong correlation is observed: when product quality is high, purchase decisions tend to be favorable, while poor product quality is associated with lower purchase decisions.

In the usability domain, the mean score was 19.79 ± 0.71, with a range of 4, and 131.1 respondents agreed, confirming a high level of satisfaction with product usability, as indicated by the correlation value (r = 0.579**). With a high score and a relatively small range, it can be concluded that consumers feel a uniform level of satisfaction with the product's ease of use. This shows that product usability is directly related to user experience and can influence purchasing decisions. Improving usability through intuitive design, user-friendly interfaces, and features that suit consumer needs can be an effective strategy in increasing purchase intention. This research is in line with previous research (20), This means consumers will be interested in purchasing if they are satisfied with the services presented in the application.

Study Limitations

The present study confronts several noteworthy limitations that warrant careful consideration. Firstly, the adoption of a cross-sectional approach restricts the investigation to a snapshot in time, relying solely on current data. Consequently, the findings lack the capacity to discern causa relationships or causal connections, hindering the ability to forecast forthcoming customer attitude dynamics. Secondly, an essential limitation is the instrument's validation procedure, which calls for a more thorough analysis with a significantly larger sample size. This underscores a potential source of bias, challenging the robustness of the study's outcomes. Thirdly, the study has a geographical constraint because the sample size is limited to the West Javan city of Bandung. The limited scope of this study makes it impossible for it to accurately represent customer opinions outside of Bandung in Indonesia, which is made up of

34 provinces. Consequently, recommendations for future research involve augmenting sample sizes comprehensively and diversifying the study's geographic scope to encompass disparate regions. Such measures aim to bolster the generalizability of findings and foster a more nuanced understanding of customer attitudes across diverse contexts.

CONCLUSION

In conclusion, this study introduces a comprehensive conceptual framework of customer attitudes towards SinoBed, with a particular focus on the influential factors of Price, Design, Quality, and Usability. The result of the collective analysis of respondent data reveals a significantly positive customer attitude towards the purchase interest in Sinobed. The high average scores and consensus among respondents in each domain indicate a strong inclination towards the product. The observed correlation values further emphasize the influential role of these factors in shaping customers' perceptions and purchase intentions. Notably, the findings underscore the importance of factors such as competitive pricing, appealing design, commendable product quality, and user-friendly features in fostering a favorable customer attitude and, consequently, encouraging purchase interest in Sinobed.

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