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Research Article

ErgoLift Clothes Pole: Effortless Lifting for Convenient Drying

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Abstract: Laundry drying remains a physically demanding task for many households and laundry businesses, especially when handling heavy wet clothes. Traditional drying poles require manual lifting, which can strain the shoulders, arms, and back, particularly among elderly individuals, those with mobility limitations, and laundromat workers handling large batches of laundry. The ErgoLift Clothes Pole, an AutoLift drying system inspired by umbrella mechanics, offers an ergonomic and accessible solution through its switch-button height-adjustment mechanism. This study aims to evaluate the usability, durability, and market potential of the ErgoLift Clothes Pole in Barangay Tisa, Cebu City. Using a descriptive research design, data were collected through surveys, interviews, and observations among households and laundromats. Findings indicate that the lifting mechanism reduces physical strain, improves efficiency, and enhances user comfort. Respondents expressed strong preference for adjustable, durable, and rust-resistant materials. Laundry businesses also recognized its potential to lessen worker fatigue and streamline workflow. Results suggest high market demand for ergonomic drying equipment, especially in compact living spaces and commercial laundry settings. Recommendations include improving material strength, expanding size variations, and optimizing cost for market competitiveness.

Keywords: ErgoLift Clothes Pole; AutoLift mechanism; ergonomics; laundry drying innovation; drying pole durability; laundry equipment

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1. Introduction

Laundry drying remains an essential household activity, yet it continues to involve repetitive lifting, overhead reaching, and sustained awkward postures that pose ergonomic risks to users. Recent ergonomic research has increasingly highlighted that repetitive domestic tasks can contribute to musculoskeletal discomfort comparable to that observed in occupational settings, particularly affecting the shoulders, arms, and lower back (Dul et al., 2012; AlOmar et al., 2021). Despite advances in workplace ergonomics, everyday household equipment has received comparatively limited research attention, even though such tools are used frequently and by diverse user groups.

In recent years, academic studies have emphasized the growing importance of ergonomic design in consumer products, particularly those intended for repeated daily use. Human-centered design research shows that products incorporating adjustability and low-force mechanisms significantly improve perceived usability and reduce physical strain (Wurzelbacher et al., 2020; van Kuijk et al., 2015). These findings are especially relevant for household tools, where users vary widely in age, strength, and physical capability.

Material durability has also emerged as a key concern in recent product and consumer research. Studies indicate that consumers increasingly associate durable, corrosion-resistant materials with product quality, reliability, and long-term value (Azzahra et al., 2023; Mesa et al., 2022). This is particularly critical in humid and tropical environments, where exposure to moisture accelerates material degradation and shortens product lifespan (Ashby & Johnson, 2009).

Urbanization and compact living conditions further reinforce the need for adaptable household solutions. Recent housing and product design studies report that space-efficient

and adjustable household equipment is increasingly favored in densely populated urban areas (Abbakyari et al., 2023; Romero, 2015). Adjustable-height mechanisms, in particular, have been shown to improve both spatial efficiency and ergonomic performance in domestic environments (Bai et al., 2024).

Additionally, recent consumer behavior research emphasizes that purchase decisions for mechanically adjustable household products are driven not only by functionality but also by perceived risk and assurance mechanisms. Warranties and product guarantees have been found to significantly influence trust and adoption, particularly for products incorporating moving parts (Phamthi et al., 2024; Sung et al., 2023).

Within this context, the ErgoLift Clothes Pole represents a timely response to current ergonomic and material challenges in household laundry drying. Featuring a switch-button height-adjustment mechanism inspired by umbrella operation, the product aims to reduce physical strain while maintaining durability and usability. This study empirically evaluates the ergonomic acceptability, preferred construction materials, and market feasibility of the ErgoLift Clothes Pole among household users in Barangay Tisa, Cebu City. By grounding product evaluation in recent academic discourse and localized user data, the study contributes to current research on ergonomic household equipment and supports evidence-based product development.

2. Materials and Methods

The materials and methods section provides a comprehensive and consolidated overview of the research design, setting, respondents, research instrument, data collection protocols, and statistical methods employed to achieve the study objectives. This detailed account ensures that all materials and processes related to the study are clearly presented to promote transparency and facilitate reader understanding.

This study employed a descriptive research design, which was systematically utilized to gather comprehensive information regarding the current conditions, prevailing opinions, and attitudes of the target respondents concerning the key variables: product acceptability (ergonomics and durability) and market potential (pricing and demand) of the innovative ErgoLift Clothes Pole. The descriptive approach was deemed appropriate for profiling existing market needs, particularly the widespread issue of physical strain associated with laundry drying, and for accurately characterizing consumer preferences for the proposed technological alternative.

The geographical focus and research setting of the study was Barangay Tisa, Cebu City. This location was selected due to its high density of residential households that actively rely on traditional outdoor drying methods, providing a representative sample of the primary target market for household laundry solutions. The respondents consisted of 375 household users residing in the area. A purposive sampling technique was employed to ensure that participants were individuals primarily responsible for household laundry activities, thereby guaranteeing that all respondents possessed direct and relevant experience with the ergonomic challenges associated with traditional drying mechanisms.

The primary data collection instrument was a structured questionnaire, which is presented in Appendix A. The questionnaire was organized into several sections: (1) user profile and current laundry habits; (2) current laundry drying experience to validate the prevalence of physical strain; (3) perceived usability and benefits of the ErgoLift Clothes Pole's ergonomic mechanism; (4) durability and market potential, including preferred materials, acceptable pricing, and ranking of purchase decision factors; and (5) recommendations and final thoughts to capture qualitative feedback for product enhancement. A five-point Likert scale was utilized to measure acceptability, supplemented by multiple-choice, ranking, and open-ended questions to obtain both quantitative and qualitative data. The conceptual product design is illustrated in Appendix B, while the switch-button mechanism and actual application of the ErgoLift Clothes Pole are shown in Appendices C and D, respectively.

The data collection process followed a systematic and rigorous protocol. Prior to final administration, the research instrument underwent pilot testing involving 30 individuals who were not part of the final sample to assess clarity, validity, and reliability, with necessary revisions implemented based on the results. Informed consent was obtained from all 375 respondents, who were fully informed of the study's purpose, assured of the confidentiality of their responses, and informed of their right to refuse participation or withdraw at any point. During the administration phase, questionnaires were distributed to selected household users

in their residences. To ensure consistent understanding of the product, brief explanations and demonstrations of the umbrella-inspired lifting mechanism were provided. Completed questionnaires were then collected, organized, and encoded into a digital spreadsheet for subsequent analysis.

The collected data were subjected to appropriate statistical treatment to address the research objectives. Frequency and percentage distribution were used to analyze respondent profiles and quantify preferences such as material choice and acceptable price range. The weighted mean (WM) was employed to determine the level of acceptability of the product's ergonomic features based on Likert-scale responses. Mean ranking was applied to prioritize the factors influencing purchase decisions and identify key demand drivers. Finally, thematic analysis was used to interpret qualitative responses related to perceived challenges and suggested design improvements.

3. Results

This section presents the findings of the study based on the data gathered from the 375 Household Users. The results are organized into subsections and presented using descriptive text and standard academic tables.

3.1. Perceived Ergonomics

The acceptability of the pole's ergonomic design was assessed using the Weighted Mean (WM) to measure the perceived ease of lifting and reduction of physical strain. The consensus among respondents was overwhelmingly positive, validating the product's core value proposition.

Table 1 shows that all ergonomic features of the product were rated as Highly Acceptable by the respondents. The switch-button mechanism received the highest weighted mean (4.61), followed by the reduction of back and shoulder strain (4.57) and overall user comfort (4.49), indicating that the product's ergonomic design is well accepted and effective in improving ease of use.

Table 1. Ergonomic features and their interpretations.

Ergonomic features	Weighted mean	Verbal interpretation
Appeal of the switch-button mechanism	4.61	Highly acceptable
Effectiveness in reducing back/shoulder strain	4.57	Highly acceptable
Enhancement of overall user comfort	4.49	Highly acceptable

Figure 1 presents the weighted mean scores for perceived ergonomics of the ErgoLift Clothes Pole. The switch-button mechanism obtained the highest weighted mean score, followed by reduction of back and shoulder strain and overall user comfort.

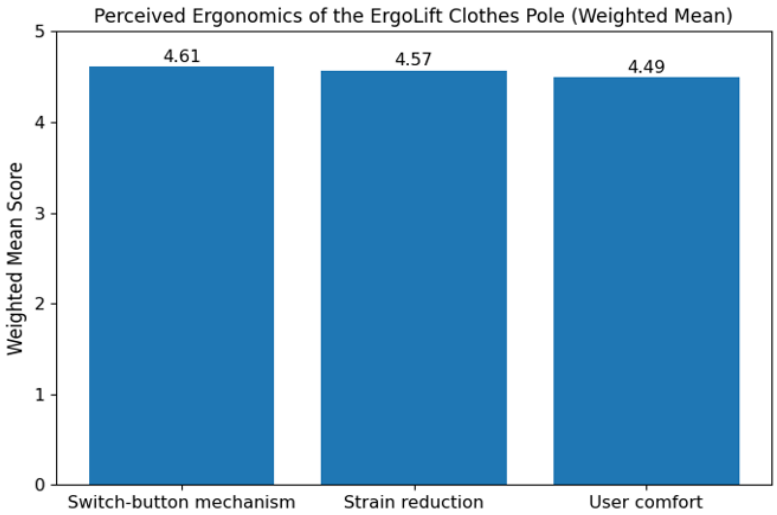

Figure 1. Perceived ergonomics of the ErgoLift Clothes Pole (weighted mean)

The data clearly indicate that respondents highly value the umbrella-inspired switch-button mechanism, which allows them to effortlessly adjust the height of the clothes pole without straining their shoulders, arms, or back. This mechanism not only improves physical comfort during the laundry process but also contributes to safer posture and reduces the risk of repetitive strain injuries. The consistently high Weighted Mean scores across all ergonomic indicators suggest that the product successfully addresses the core problem identified in the study, namely the physical challenges associated with manually lifting wet clothes on traditional drying poles. Furthermore, the results imply that ergonomic innovation is a significant factor influencing user satisfaction and overall acceptance of household utility products in this community.

3.2. Materials for Durability

The preferred materials for durability were assessed to determine which material characteristics are most valued by users in terms of strength, longevity, and suitability for regular household use. These preferences reflect consumer expectations for product reliability and resistance to wear over time.

Table 2 indicates that High-Grade Stainless Steel is the most preferred material, representing 85.6% of the responses, which highlights the importance placed on durability and rust resistance. Lightweight Aluminum Alloy (8.0%) and Galvanized/Treated Steel (6.4%) received considerably lower preferences, suggesting limited confidence in their long-term durability

Table 2. Preferred materials for durability.

Material Preference	Frequency	Percentage %
High grade stainless steel	321	85.6%
Lightweight aluminum alloy	30	8.0%
Galvanized/Treated steel	24	6.4%

Figure 2 presents the percentage distribution of respondents' preferred materials for durability. High-grade stainless steel recorded the highest preference, followed by lightweight aluminum alloy and galvanized/treated steel.

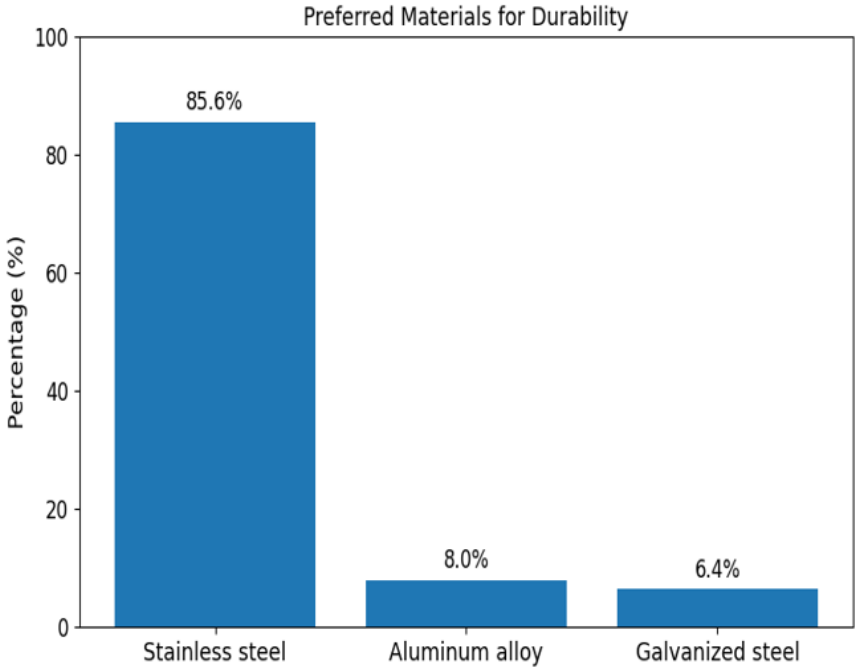

Figure 2. Analysis of preferred materials durability.

The overwhelming preference for High-Grade Stainless Steel indicates that consumers prioritize durability and rust-resistance above other material considerations. Respondents clearly perceive that long-term reliability is essential for household products exposed to constant moisture and heavy usage. The comparatively low selection of Aluminum Alloy and Galvanized Steel reflects concerns about insufficient strength and susceptibility to corrosion, highlighting that innovative features like the switch-button mechanism must be complemented by high-quality materials to achieve full market acceptability. This finding underscores the notion that, in environments with high humidity and frequent use, mechanical innovation alone is insufficient; material quality and longevity are critical drivers of consumer trust and willingness to invest in new household equipment.

3.3. Acceptable Pricing Range

The acceptable pricing range was examined to identify the price points considered reasonable by respondents, reflecting their perception of value and willingness to invest in the product. Understanding these preferences helps guide pricing strategies that align with market expectations.

Table 3 shows that the majority of respondents (70.1%) preferred a price below PHP 1,000, indicating strong support for a premium pricing approach that remains affordable. A smaller portion of respondents favored the PHP 2,501–PHP 4,000 range (19.2%) or PHP 1,001-PHP 2,500 (8.0%), reflecting niche segments willing to pay higher prices. These results suggest that most consumers prioritize affordability while a smaller market is open to higher-priced, high-quality products

Table 3. Acceptable pricing ranges among respondents.

Acceptable price range (PHP)	Frequency (F)	Percentage	Market implication
PHP 1,001 - PHP 2,500	30	8.0%	Value Segment
PHP 2,501 - PHP 4,000	72	19.2%	High Premium Supported
Below PHP 1,000	263	70.1%	Premium Pricing Supported

Figure 3 presents the percentage distribution of respondents' acceptable price ranges for the ErgoLift Clothes Pole. The majority of respondents preferred a price below PHP 1,000, followed by PHP 2,501-4,000 and PHP 1,001-2,500.

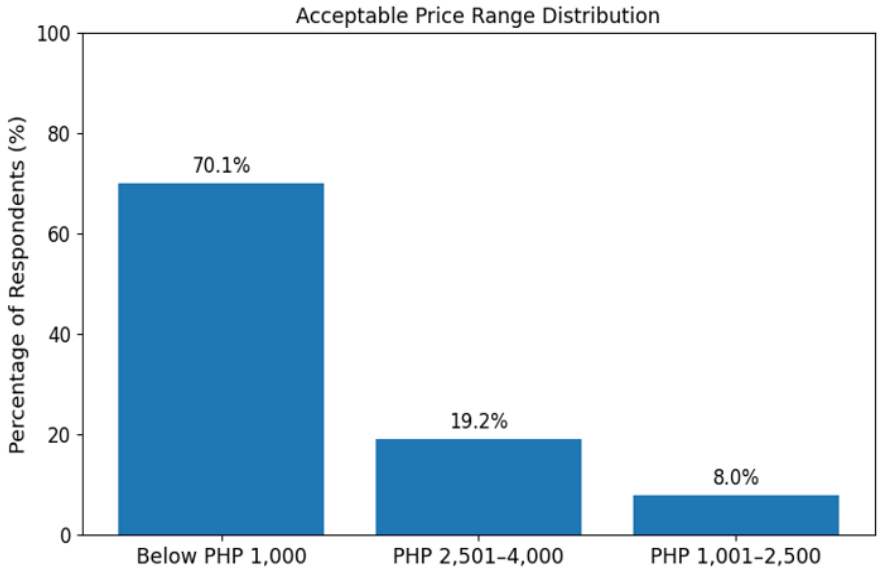

Figure 3. Acceptable price range distribution.

The majority of respondents expressed a preference for purchasing the ErgoLift Clothes Pole at a price below PHP 1,000, indicating a strong market segment that seeks both affordability and perceived value. This result demonstrates that, while ergonomic and material innovations are important, consumers remain highly sensitive to price and expect practical solutions that deliver significant benefits without imposing an excessive financial burden. The willingness of some respondents to accept higher price ranges suggests the presence of niche groups that are prepared to pay a premium for superior features, such as enhanced durability and ergonomic convenience. Overall, this finding highlights the importance of balancing product innovation, material quality, and pricing strategy to effectively meet market expectations.

Table 4 presents the factors influencing consumers' purchase decisions for the ErgoLift Clothes Pole. The findings show that durability and long-term performance are the most influential factors, followed by ease of use and ergonomic considerations. Warranty and product guarantees are also considered important, indicating that respondents place high value on reliability and risk reduction when evaluating mechanically adjustable household equipment

Table 4. Factors influencing purchase decision.

Purchase influence factor	Mean rank (1 = highest influence)	Rank
Durability/Long Term performance	1.95	1
Ease of use / ergonomics	2.10	2
Warranty product guarantee	2.03	3

Figure 4 presents the mean rank values of factors influencing purchase decisions for the ErgoLift Clothes Pole. Durability ranked as the most influential factor, followed by warranty and ease of use.

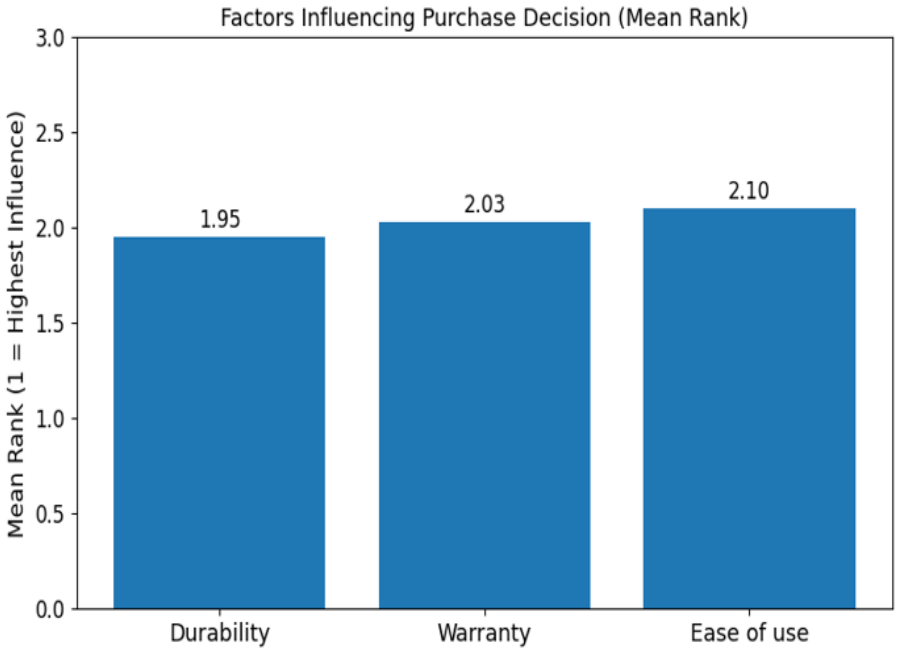

Figure 4. Factors influencing purchase decision (mean rank).

The ranking of purchase influence factors reveals that durability and long-term performance are the primary drivers behind household purchasing decisions, even surpassing the product's ergonomic innovation. Consumers clearly prioritize mechanical reliability and resistance to wear and corrosion, indicating that functional longevity is a decisive factor in justifying investment in new household equipment. Ease of use, while highly valued, ranks second, suggesting that ergonomic benefits alone may not secure consumer adoption unless durability is also guaranteed. The relatively high importance placed on warranty and product guarantees further reinforces the idea that perceived risk reduction and confidence in product lifespan play a critical role in shaping consumer behavior. This finding emphasizes that successful product design must integrate both innovation and material robustness to effectively meet market demands.

3.4. Empirical Evidence on Ergonomic Acceptability and Market Viability

This section synthesizes the empirical findings related to ergonomic acceptability, material dependency, pricing feasibility, and dominant demand drivers for the ErgoLift Clothes Pole. The analysis is based on descriptive and ranking statistics derived from survey responses of household users in Barangay Tisa, Cebu City.

Survey results indicate a high level of ergonomic acceptability for the switch-button lifting mechanism of the ErgoLift Clothes Pole. The weighted mean scores for both the appeal of the mechanism (WM = 4.61) and its effectiveness in reducing physical strain (WM = 4.57) fall within the "Highly Acceptable" range. These findings demonstrate that the integration of a height-adjustable lifting mechanism substantially enhances perceived comfort and usability during laundry drying activities.

Market acceptability was found to be strongly dependent on material selection. A substantial majority of respondents (85.6%) expressed a preference for high-grade stainless steel, highlighting the importance of rust resistance and long-term durability, particularly in humid tropical environments. The results indicate that ergonomic innovation alone is insufficient to sustain market acceptance without the use of materials that ensure structural reliability and longevity.

Analysis of acceptable pricing ranges reveals the presence of a viable market segment willing to support a premium price point below PHP 1,000. Approximately 70.1% of respondents identified this range as acceptable. This willingness to pay reflects the perceived value generated by the combined benefits of ergonomic convenience and expectations of durable construction.

Among the factors influencing purchase decisions, durability and long-term performance emerged as the most influential determinant. Mean rank analysis shows that

durability ranked higher than ease of use and ergonomic considerations. Warranty and product guarantee were also identified as important supporting factors, emphasizing the role of risk reduction in consumer decision-making for mechanically adjustable household equipment.

Table 5 presents the empirical basis supporting ergonomic acceptability and market viability of the ErgoLift Clothes Pole, summarizing key findings related to ergonomics, material preference, pricing feasibility, and purchase decision factors.

Table 5. Empirical basis supporting ergonomic acceptability and market viability.

Evaluation aspect	Measurement indicator	Statistical result	Description
Ergonomic acceptability	Appeal of the switch-button lifting mechanism	WM = 4.61	Rated as highly acceptable
Ergonomic effectiveness	Reduction of physical strain during use	WM = 4.57	Rated as highly acceptable
Material preference	High-grade stainless steel	85.6% of respondents	Preferred material for durability
Pricing feasibility	Acceptable price below PHP 1,000	70.1% of respondents	Indicates premium market viability
Primary demand driver	Durability / long-term performance	Mean Rank = 1.95	Highest influence on purchase decision
Secondary factor	Ease of use / ergonomics	Mean Rank = 2.10	Moderate influence
Risk mitigation factor	Warranty / product guarantee	Ranked among key factors	Enhances buyer confidence

Therefore, the findings indicate that the ErgoLift Clothes Pole demonstrates strong ergonomic acceptability and market viability when ergonomic design is complemented by durable, high-quality materials and appropriate pricing. Collectively, the results underscore that durability and long-term performance, supported by ergonomic benefits and warranty assurances, are the primary drivers of consumer acceptance in this product category.

4. Discussion

The findings of the present study are consistent with recent academic literature emphasizing the role of ergonomic design in shaping consumer acceptance and purchase intention. High acceptability ratings for the switch-button lifting mechanism and the reduction of physical strain support earlier findings that perceived ease of use and physical comfort significantly influence users' willingness to adopt household products (Dul et al., 2012; Norman, 2013; Salvendy, 2012). Similar studies have shown that ergonomically designed products reduce musculoskeletal discomfort and improve task efficiency, particularly in repetitive domestic activities (Pheasant & Haslegrave, 2006; Helander, 2006).

The strong ergonomic acceptability observed in this study aligns with empirical evidence indicating that usability and perceived comfort positively affect behavioral intention and satisfaction (Pratama et al., 2023; Nielsen, 1993). Research in human-centered product design further confirms that adjustability and intuitive mechanisms enhance user trust and perceived usefulness, reinforcing the relevance of the switch-button lifting system used in the ErgoLift Clothes Pole (Ulrich & Eppinger, 2000; Norman, 2013).

Beyond ergonomics, the dominance of durability as the primary purchase driver in this study mirrors findings in consumer and product-quality research. Studies consistently report that perceived product quality and long-term performance exert a stronger influence on purchase decisions than functional convenience alone (Azzahra et al., 2023). The overwhelming preference for high-grade stainless steel among respondents reflects broader evidence that material strength and resistance to corrosion are critical determinants of perceived value, especially in humid environments (Ashby & Johnson, 2009; Callister & Rethwisch, 2018).

Pricing preferences observed in this study further support existing literature on perceived value and price sensitivity. Research shows that consumers evaluate price fairness by weighing cost against functional and quality benefits, which directly influences willingness to pay (Santos et al., 2025). Although ergonomic innovation adds value, affordability remains a decisive factor for mass adoption, consistent with findings reported in consumer pricing studies (Aswin et al., 2024).

Additionally, the importance placed on warranty and product guarantees aligns with studies on perceived risk and trust in mechanically adjustable products. Prior research demonstrates that assurance mechanisms significantly reduce perceived performance risk and strengthen purchase intention (Putra & Lestari, 2023). Overall, the present findings corroborate recent academic evidence suggesting that successful household product adoption depends on a balanced integration of ergonomic design, durable materials, fair pricing, and risk-mitigation strategies.

5. Conclusion

This study evaluated the ergonomic acceptability, durability, and market potential of the ErgoLift Clothes Pole as an improved alternative to conventional laundry drying systems. The findings indicate that the switch-button lifting mechanism is highly effective in reducing physical strain during clothes hanging activities, contributing to improved comfort, usability, and user satisfaction. Respondents expressed strong acceptance of the ergonomic design, particularly its ease of operation and suitability for frequent household use, highlighting its potential to address common musculoskeletal concerns associated with traditional fixed clothes poles.

Durability emerged as the most critical factor influencing purchase decisions, with a clear preference for high-grade stainless steel materials due to their long-term reliability and resistance to corrosion in humid environments. This result underscores the importance of material quality in ensuring sustained product performance and consumer trust. While ergonomic features were highly valued, respondents demonstrated a greater willingness to prioritize durability when making purchasing decisions, especially for mechanically adjustable household equipment.

In terms of market potential, the ErgoLift Clothes Pole demonstrated strong viability within a premium market segment. Most respondents indicated a willingness to purchase the product at a price below PHP 1,000, reflecting positive perceived value derived from the combined benefits of ergonomic efficiency and durable construction. Additionally, the emphasis placed on warranty and product guarantees suggests that consumers seek assurance against mechanical failure before adopting innovative household technologies. Overall, the study confirms that the ErgoLift Clothes Pole presents a promising, user-centered solution that balances ergonomic design, durability, and perceived value, supporting its potential for successful market adoption.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Questionnaire: ErgoLift Clothes Pole Research

Section 1. User Profile

This section helps us understand your background and current laundry habits.

What is your age?

☐ Under 18

☐ 18–24

☐ 25–34

☐ 35–44

☐ 45–54

☐ 55 or older

What is your gender?

☐ Male

☐ Female

☐ Prefer not to say

What is your occupation?

Where do you primarily do your laundry?

☐ At home

☐ At a laundromat

☐ Both

On average, how many loads of laundry do you do per week?

Section 2. Current Laundry Drying Experience

These questions focus on your current experience with traditional drying methods.

What type of drying method do you currently use? (Select all that apply)

☐ Traditional drying pole/rod

☐ Drying rack

☐ Clothesline

☐ Electric dryer

☐ Other (please specify): _____

How would you describe your experience with your current drying method?

(e.g., easy, difficult, convenient, physically straining)

What are the biggest challenges you face with your current drying setup?

(Open-ended)

Section 3. ErgoLift Clothes Pole: Usability and Benefits

This section explores your perception of the ErgoLift Clothes Pole's features and potential benefits.

The ErgoLift Clothes Pole has a switch-button mechanism similar to an umbrella, allowing you to easily adjust its height. Based on this description, how appealing is this feature to you?

☐ Very appealing

☐ Somewhat appealing

☐ Neutral

☐ Not very appealing

☐ Not appealing at all

How likely would you be to use a drying pole that reduces physical strain and effort?

☐ Very likely

☐ Likely

☐ Neutral

☐ Unlikely

☐ Very unlikely

What specific features of the ErgoLift Clothes Pole, such as adjustable height, do you find most beneficial for household or business use?

(Open-ended)

Do you believe this product would be particularly helpful for elderly individuals or those with limited mobility? Why or why not?
(Open-ended)

Section 4. Durability and Market Potential
These questions focus on materials, price, and overall market demand.
Durability is an important aspect of laundry equipment. What materials would you prefer the ErgoLift Clothes Pole to be made of to ensure it is rust-resistant and long-lasting?
☐ High-grade stainless steel
☐ Lightweight aluminum alloy
☐ Galvanized/treated steel
☐ Other (please specify): _____
How much would you be willing to pay for an innovative, durable, and user-friendly drying pole like the ErgoLift Clothes Pole?
☐ Below PHP 1,000
☐ PHP 1,001 – PHP 2,500
☐ PHP 2,501 – PHP 4,000
☐ Above PHP 4,000
What factors would most influence your decision to purchase the ErgoLift Clothes Pole? (Select up to three)
☐ Price
☐ Durability/long-term performance
☐ Ease of use/ergonomics
☐ Space-saving design
☐ Positive reviews
☐ Warranty
☐ Aesthetic/design
☐ Other (please specify): _____
Do you think there is strong demand for a product like the ErgoLift Clothes Pole in your community or area? Why or why not?
(Open-ended)

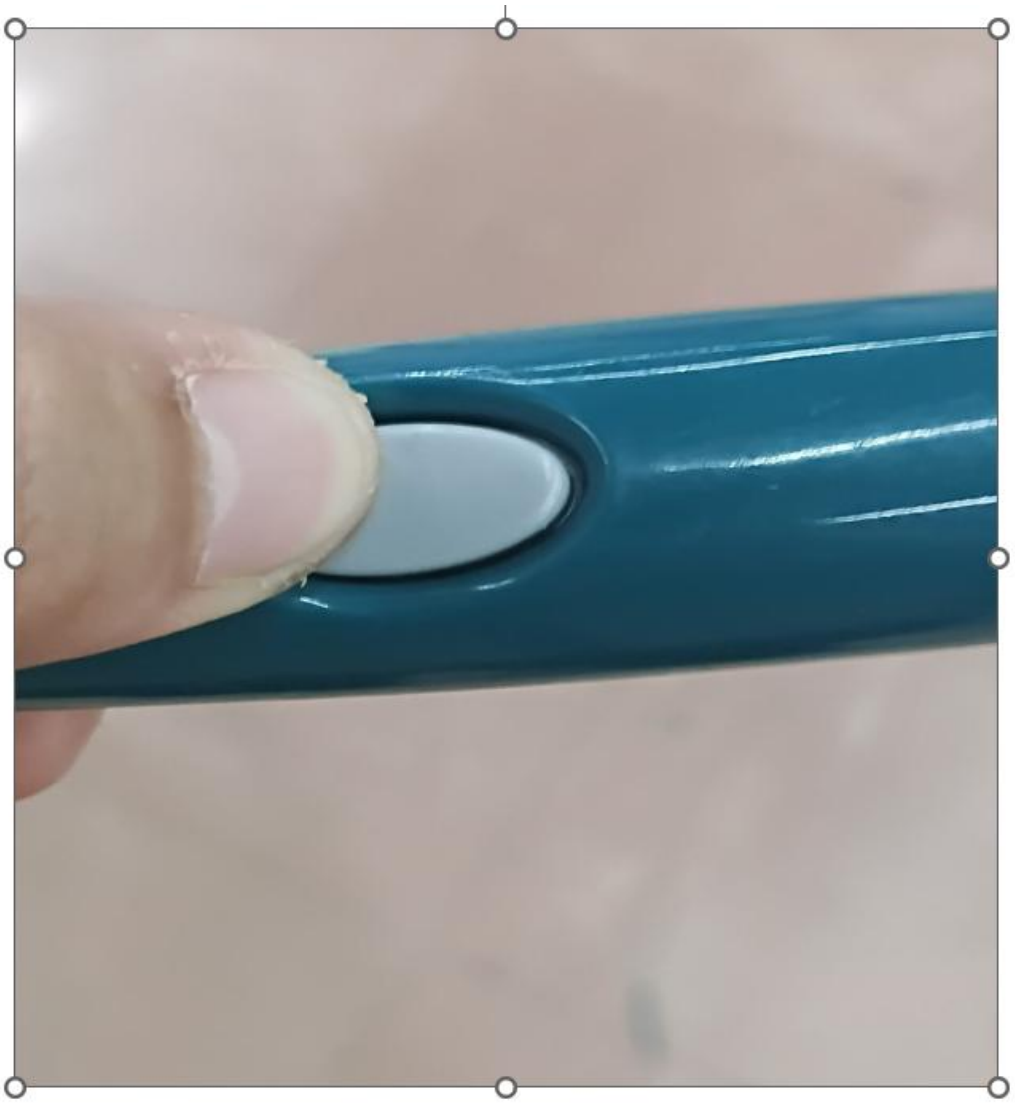
Section 5. Recommendations and Final Thoughts
This section allows for open-ended feedback and suggestions.
What recommendations would you make to improve the design or marketability of the ErgoLift Clothes Pole?
(Open-ended)
Do you have any additional comments or thoughts about the ErgoLift Clothes Pole or laundry drying in general?

Appendix B

Product design

Appendix C

Button of Ergo Lift Clothes Pole



Appendix D.

Ergo Lift Clothes Pole

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