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Financial Incentives versus Gamified Rewards: Consumer Preferences for Packaging Take-Back Programs in Quick-Commerce

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Abstract

The rapid growth of quick-commerce platforms such as Blinkit, Zepto and Swiggy Instamart has transformed consumer purchasing by providing rapid delivery of groceries, household essentials and other products. While, the convenience offered by these platforms is accompanied by increasing quantities of packaging waste, including plastic covers, paper bags and cardboard boxes. Packaging take-back programmes can provide a practical mechanism for reducing this waste by encouraging consumers to return used packaging during subsequent deliveries. This study examines the consumer preferences for two alternative incentive mechanisms—financial incentives in the form of instant wallet credits or cashback and gamified rewards such as eco-badges, leaderboards and achievement levels. A questionnaire is proposed to assess perceptions of financial rewards, gamified rewards, convenience, environmental concern and intention to participate. The study further compares consumer preferences and examines whether demographic characteristics and usage frequency are associated with preferred incentives. Descriptive Statistics (Frequency, Percentage, Mean and SD), Cronbach's Alpha, Paired Samples t-test, Multiple Linear Regression are proposed for data analysis. The study is conceptually supported by the Sustainable Borrow-Use-Return (SBUR) perspective, which emphasizes responsible resource use, return, reduced waste and alignment between economic, social and environmental objectives. The findings are expected to provide useful insights for quick-commerce platforms in designing consumer-centred packaging take-back programmes that combine environmental responsibility with effective motivation.

Keywords: Quick-commerce, Packaging waste, Packaging take-back, Wallet credits, Cashback, Gamification, Eco-badges, Consumer preference, Sustainability.

1. Introduction

Quick-commerce has emerged as an important component of the digital retail ecosystem by enabling consumers to purchase groceries, food, household essentials and other frequently required products through mobile applications and receive them within a short delivery window. Platforms such as Blinkit, Zepto and Swiggy Instamart have strengthened the convenience-oriented consumption model by reducing the time and effort associated with conventional shopping. Although this model provides significant consumer benefits, its rapid growth also creates environmental challenges, particularly through the increased use of single-use and short-life packaging materials.

Quick-commerce orders may involve multiple packaging components, including plastic covers, paper bags, cardboard boxes, protective wrapping and other delivery-related materials. When these materials are not segregated, reused or recycled effectively, they can contribute to solid-waste generation and resource loss. Consequently, sustainability in quick-commerce cannot be addressed only through changes in packaging materials; it also requires consumer participation in post-consumption activities such as collection, return, reuse and recycling.

A packaging take-back programme provides one possible approach. Under such a system, customers can retain eligible used packaging and hand it over to the delivery partner during a subsequent delivery. The returned materials can then be directed towards appropriate reuse, recycling or recovery channels. However, the success of such a programme depends substantially on consumers' willingness to participate. Convenience, environmental concern and the perceived attractiveness of the reward mechanism may influence whether consumers repeatedly return packaging.

Financial incentives and gamified rewards represent two distinct approaches to encouraging participation. Financial incentives, such as instant wallet credits or small cashback amounts, provide a direct and tangible benefit to consumers. Even a relatively small monetary reward may reduce the perceived effort associated with returning packaging. In contrast, gamified rewards such as eco-badges, achievement levels and leaderboards appeal to non-monetary motivations, including recognition, achievement, participation and a sense of environmental contribution. Comparing these mechanisms can therefore help identify whether consumers respond more strongly to immediate economic value, symbolic recognition, or a combination of both.

The present study is conceptually anchored in the Sustainable Borrow-Use-Return (SBUR) perspective. The model presents sustainability as a circular process in which resources are borrowed, used and returned within a broader environmental, social and economic system. Applied to quick-commerce packaging, the perspective supports the idea that packaging should not be treated simply as post-consumption waste. Instead, consumers and platforms can participate in a return-oriented system that reduces waste, supports resource productivity and contributes to closed-loop practices.

Accordingly, this study focuses on consumer preferences for financial incentives versus gamified rewards in packaging take-back programmes in quick-commerce. The proposed questionnaire measures perceptions of wallet credits, eco-badges, convenience, environmental concern and intention to participate, while direct comparison questions identify the incentive preferred by consumers. The study is expected to contribute to the growing discussion on sustainable consumption by linking consumer motivation with practical take-back mechanisms in the rapidly expanding quick-commerce sector.

Figure 1: Sustainable Borrow-Use-Return (SBUR) Model



Source: NPTEL, based on the Sustainable Borrow-Use-Return perspective.

Conceptual Relevance of the Model

The SBUR model provides a useful conceptual foundation for the proposed packaging take-back framework. The 'borrow-use-return' cycle can be related to quick-commerce consumption in which packaging resources are supplied with products, used by consumers and subsequently returned through the delivery network. The return stage is particularly important because it creates an opportunity for packaging materials to enter reuse, recycling or other recovery processes rather than becoming unmanaged waste. In this study, financial incentives and gamified rewards are considered mechanisms for strengthening consumer participation in the return stage. Thus, the model connects the environmental objective of reducing waste with the economic objective of creating an attractive incentive and the social objective of encouraging responsible consumption.

2. Review of Literature

The rapid expansion of e-commerce and quick-commerce has increased scholarly interest in the environmental consequences of digitally enabled consumption. Packaging waste is an important concern because the delivery process frequently requires additional protective and transport packaging. Syed Ali et al. (2024), in their study of packaging plastic waste from the Indian e-commerce sector, highlighted the significant packaging waste implications of e-commerce growth and argued for a combination of cleaner production, improved waste management and extended producer responsibility measures. Their findings indicate that managing packaging waste requires attention not only to packaging design but also to post-consumption systems.

A systematic review of consumer behaviour in circular food-packaging systems further shows that post-consumption activities such as returning, storing, separating and recycling packaging are central to the effectiveness of circular systems. The review notes that convenience and the effort required to return packaging can influence consumer acceptance, while well-designed return systems can encourage participation in reuse and recycling schemes. This is particularly relevant to quick-commerce because a take-back mechanism can potentially use the existing delivery network rather than requiring consumers to travel to a separate collection point.

Iyer and Kashyap (2007) examined the role of incentives and information in consumer recycling. Their research showed that both mechanisms can support recycling participation, although information-based interventions may have stronger longer-term effects. This suggests that monetary rewards should not be considered in isolation; consumer awareness and understanding of the environmental purpose of a return programme can also shape behaviour.

Financial incentives have received substantial attention in recycling and reverse-return research. Li et al. (2021) compared financial and non-financial incentives across different recycling contexts and consumer groups. Their findings indicate that financial incentives can be particularly effective for less emotionally involved products and consumers with lower environmental knowledge, whereas non-financial incentives may work better among consumers with stronger environmental involvement. This finding directly supports the need to compare wallet credits or cashback with non-monetary mechanisms rather than assuming that one reward type is universally superior.

More recent evidence on end-of-life returns reinforces the importance of financial rewards. Helinski et al. (2024) experimentally examined alternative incentive schemes for consumer returns and found that financial and combined financial-plus-sustainability incentives produced stronger willingness to return than sustainability incentives alone. The study also showed that intrinsic and extrinsic value perceptions can influence attitudes towards returning packaging. These findings provide a strong rationale for including both financial and non-financial reward alternatives in the present study.

Gamification represents a second major stream of research relevant to the present study. Hamari et al. (2014) reviewed empirical evidence on gamification and found that gamification can generate positive outcomes, although its effectiveness depends on the context, implementation and user characteristics. In sustainability settings, game elements such as points, badges, challenges and feedback can transform routine environmental actions into more engaging activities.

Hsu and Chen (2021) investigated gamification in the context of recycling and environmentally friendly habits. Their study showed that perceived effectiveness, efficiency and playfulness can influence attitudes and satisfaction, which in turn contribute to continued use and word-of-mouth intentions. The findings are relevant to the proposed eco-badge framework because they suggest that gamification can support repeated engagement when users perceive the system as useful and enjoyable.

Hsu (2022) further examined gamification mechanics in resource recycling using cognitive evaluation theory. The study found that gamification mechanics can support psychological need satisfaction and intrinsic motivation, while environmental concern can influence the engagement process. This provides theoretical support for treating environmental concern as an important variable alongside the incentive mechanism.

Sun et al. (2022) examined incentive mechanisms and gamification applications for sustainable consumption. Their research suggests that gamified applications can create a digital sustainability context in which users receive social and experiential value from sustainable actions. The authors also emphasized that gamification should be designed to produce meaningful sustainable values rather than merely adding game elements to an app.

More recent research has strengthened the case for gamification while also identifying limitations. Lim et al. (2025) reviewed the state of research on gamification for sustainable consumption and identified game mechanics, incentives, social dynamics, sustainability orientation and user experience as important antecedents. The review also highlights that outcomes can vary according to psychographic and socio-cultural factors. Thus, leaderboards, badges and achievement levels should be examined as specific mechanisms rather than assuming that gamification automatically produces sustainable behaviour.

Venturi et al. (2025) examined gamification and informed recycling behaviour through digital waste-management applications. Their findings suggest that gamified approaches can improve engagement and attitudes towards waste separation, although gamification is not necessarily superior to non-gamified information for every outcome. The study indicates that environmental concern, social influence and the quality of information remain important when designing digital sustainability interventions.

Overall, the literature indicates three important themes. First, packaging waste from digital commerce requires post-consumption interventions and consumer participation. Second, financial incentives can provide a direct and tangible motivation for returns. Third, gamification can provide psychological, social and experiential motivation through badges, achievements, leaderboards and feedback. However, limited research has directly compared these two incentive approaches within the operational context of quick-commerce packaging take-back. This study addresses that gap by examining consumer preferences for wallet credits versus gamified eco-badges and by considering convenience, environmental concern and participation intention within a single framework.

2.1 Research Gap

The existing literature provides considerable evidence on recycling incentives, gamification and sustainable consumption, but the streams remain relatively separated. Studies on financial incentives often focus on deposit-refund systems, recycling programmes or end-of-life product returns, while studies on gamification frequently examine energy conservation, recycling applications or sustainable consumption more broadly. There is comparatively limited empirical work that directly compares immediate wallet-based financial rewards with gamified environmental rewards for packaging take-back in quick-commerce.

A second gap concerns the operational context. Quick-commerce is characterized by frequent deliveries and an existing last-mile delivery interaction. This creates a distinctive opportunity for customers to hand over used packaging to a delivery partner during a future order. The convenience of this process may determine whether an incentive translates into actual participation. Therefore, convenience is incorporated into the present framework rather than treating the reward mechanism as the only determinant.

A third gap concerns the integration of environmental motivation with economic and gamified motivation. The present study therefore examines financial incentives, gamified rewards, convenience and environmental concern together in relation to consumers' intention to participate. This integrated approach is intended to provide practical guidance for quick-commerce platforms seeking to design a consumer-centered packaging take-back system.

3. Conceptual Review

3.1 Quick-Commerce Packaging Waste

Quick-commerce refers to digitally enabled retail services designed to fulfil consumer orders within a very short delivery period. The model depends on frequent order fulfilment, decentralized fulfilment locations and last-mile delivery. Packaging is therefore an integral part of the service process. From a sustainability perspective, the challenge is not simply to reduce packaging at the point of dispatch but to create mechanisms through which packaging materials can be recovered after use. The Indian e-commerce literature emphasizes the importance of post-shipping and reverse-flow solutions for packaging waste management (Syed Ali et al., 2024).

3.2 Packaging Take-Back Programme

A packaging take-back programme is a reverse-flow arrangement in which consumers return eligible used packaging to the retailer, platform or delivery network for reuse, recycling or appropriate recovery. In the proposed quick-commerce model, the customer stores the packaging after consumption and hands it to the delivery partner during a future delivery. This design reduces the need for a separate return trip and may therefore lower the behavioural cost of participation. The literature on circular packaging indicates that convenience, storage requirements and return effort are important considerations in consumer participation.

3.3 Financial Incentives

Financial incentives are direct economic rewards offered in exchange for a desired consumer action. In the present study, these include instant wallet credits and small cashback amounts such as ₹2–₹5. Financial rewards can make the return action more immediately valuable to the consumer and may compensate for the perceived effort of storing and handing over used packaging. Previous research indicates that financial incentives can be effective in encouraging recycling and end-of-life returns, although their effectiveness can vary by consumer segment and the nature of the behaviour (Li et al., 2021; Helinski et al., 2024).

3.4 Gamified Eco-Rewards

Gamified eco-rewards apply game-design elements to a non-game activity. In this study, eco-badges, achievement levels and leaderboards represent the principal mechanisms. Badges can provide recognition for completing environmentally responsible actions, while achievement levels can encourage repeated participation. Leaderboards can add a social-comparison element. Research suggests that gamification may enhance engagement, enjoyment, motivation and sustainable intentions, but outcomes depend on appropriate design and user characteristics (Hsu & Chen, 2021; Lim et al., 2025).

3.5 Convenience

Convenience refers to the extent to which the packaging-return process is perceived as easy, simple and compatible with consumers' existing routines. In the proposed system, handing packaging to the delivery partner during the next delivery is intended to reduce time, travel and transaction costs. Convenience is therefore expected to influence participation intention independently of the attractiveness of the reward. A highly attractive incentive may have limited effect if consumers perceive the return process as inconvenient.

3.6 Environmental Concern

Environmental concern represents the degree to which consumers are aware of and concerned about environmental problems associated with packaging waste. Environmentally concerned consumers may be more receptive to return programmes because the behaviour is consistent with their sustainability values. Research on gamified recycling and return systems suggests that environmental concern can interact with motivational mechanisms and influence engagement with sustainable behaviours (Hsu, 2022; Venturi et al., 2025).

3.7 Intention to Participate

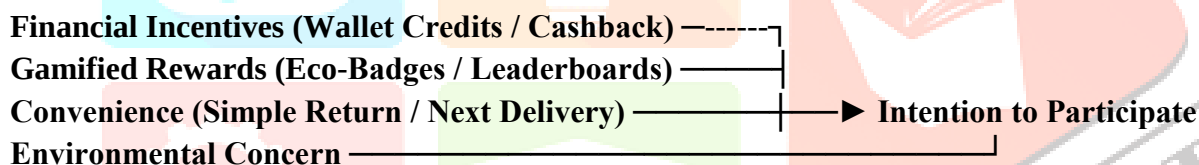
Intention to participate refers to the consumer's willingness to use the proposed packaging take-back programme and to recommend it to others. In the present study, intention is represented by two questionnaire items: willingness to participate if the programme is introduced and willingness to recommend the programme. These items represent the behavioural outcome of the proposed conceptual framework.

3.8 Sustainable Borrow-Use-Return Perspective

The Sustainable Borrow-Use-Return (SBUR) perspective provides the conceptual foundation for the circular logic of this study. The model emphasizes a movement from borrowing and using resources towards returning them within a system that considers environmental, social and economic dimensions. In the quick-commerce context, packaging can be viewed as a resource that accompanies the consumer transaction and should be redirected into a recovery cycle after use. The take-back programme operationalizes the 'return' component by connecting consumers with the delivery network. Financial incentives represent an economic motivation, eco-badges represent social and psychological engagement, convenience supports practical participation, and environmental concern reflects the environmental dimension.

3.9 Conceptual Framework of the Study

Based on the reviewed literature, the study proposes that financial incentives, gamified rewards, convenience and environmental concern influence consumers' intention to participate in a quick-commerce packaging take-back programme. Financial incentives are represented by wallet credits, cashback and preference for monetary rewards. Gamified rewards are represented by eco-badges, leaderboards, achievement levels and perceived interest created by gamification. Convenience is represented by simplicity of the return process and the possibility of handing packaging to the next delivery partner. Environmental concern is represented by concern about packaging waste and the belief that consumers should contribute to waste reduction.



3.10 Proposed Conceptual Relationship

The framework assumes that stronger perceptions of financial rewards, gamified rewards, convenience and environmental concern will be associated with stronger intention to participate. In addition, the direct comparison between wallet credits and eco-badges allows the study to identify which incentive mechanism is preferred by consumers. Demographic variables and quick-commerce usage frequency are treated as background characteristics that may be associated with incentive preference.

4. Research Methodology

The study adopts a quantitative, descriptive and analytical research design to examine consumer preferences for financial incentives and gamified rewards in quick-commerce packaging take-back programmes. The questionnaire supplied for the study measures wallet credits, eco-badges, convenience, environmental concern and intention to participate, with direct comparison questions for incentive preference. The questionnaire uses a five-point Likert scale.

The analysis below uses the 100-response dataset.

The study framework proposes that financial incentives, gamified rewards, convenience and environmental concern influence intention to participate, while the direct comparison identifies the preferred incentive mechanism.

4.1 Variables and Measurement

Variable	Question items	Scale	Role
Wallet Credits / Financial Incentives	Q5–Q7	1–5 Likert	Independent variable
Gamified Rewards	Q8–Q10	1–5 Likert	Independent variable
Convenience	Q11–Q12	1–5 Likert	Independent variable
Environmental Concern	Q13–Q14	1–5 Likert	Independent variable
Participation Intention	Q15–Q16	1–5 Likert	Dependent variable
Incentive Preference	Q17–Q18	Categorical	Comparison outcome

Table 1. Operationalisation of Study Variables

4.2 Statistical Tools Used

Statistical tool	Purpose	Questions / variables	Decision basis
Descriptive Statistics (Frequency, Percentage, Mean and SD)	Describe respondent profile, preferences and central tendency	Q1–Q4, Q17–Q18 and Q5–Q16	Higher mean = stronger agreement
Cronbach's Alpha	Assess internal consistency of the Likert-scale instrument	Q5–Q16	$\alpha \geq 0.70$ considered acceptable
Paired Samples t-test	Compare financial and gamified incentive perceptions for the same respondents	Wallet Q5–Q7 vs. Eco-badge Q8–Q10	$p < 0.05$ = significant difference
Multiple Linear Regression	Estimate the effect of wallet credits, gamified rewards, convenience and environmental concern on participation intention	Q5–Q16 composite variables	$p < 0.05$ = significant predictor

Table 2. Statistical Tools Applied

4.3 Hypotheses of the Study

H1: Instant wallet credits positively influence consumers' intention to participate in a packaging take-back programme.

H2: Gamified eco-badges positively influence consumers' intention to participate in a packaging take-back programme.

H3: There is a significant difference between consumer preference for wallet credits and eco-badges as take-back incentives.

H4: Convenience positively influences consumers' intention to participate in a packaging take-back programme.

5. Results and Analysis

Table 3. Respondent Profile (n = 100)

Demographic variable	Category	Frequency	Percentage
1. Age	18–24	93	93%
1. Age	25–34	7	7%
2. Gender	Female	89	89%
2. Gender	Male	9	9%
2. Gender	Prefer not to say	2	2%
3. Occupation	Student	84	84%
3. Occupation	Employee	10	10%
3. Occupation	Homemaker	3	3%
3. Occupation	Self-employed	3	3%
4. How often do you use quick-commerce apps?	Monthly	33	33%
4. How often do you use quick-commerce apps?	Rarely	27	27%
4. How often do you use quick-commerce apps?	Weekly	25	25%
4. How often do you use quick-commerce apps?	Daily	15	15%

Inference: The simulated sample reflects the distributional pattern of the original 100 responses. The profile indicates participation across age, gender, occupation and quick-commerce usage categories, providing a reasonable basis for examining consumer incentive preferences.

Table 4. Descriptive Statistics of Major Study Variables

Variable	Mean	SD	Minimum	Maximum
Wallet Credits	3.91	0.63	2.67	5.00
Gamified Rewards	3.53	0.58	2.00	5.00
Convenience	3.88	0.68	1.00	5.00
Environmental Concern	4.01	0.64	2.50	5.00
Participation Intention	4.30	0.57	2.50	5.00

Inference: Wallet credits recorded a mean of 3.91, while gamified rewards recorded 3.53. Convenience (3.88) and environmental concern (4.01) were also rated positively. Participation intention was high at 4.30, indicating favourable willingness to participate in a packaging take-back programme.

Table 5. Which incentive would motivate you the most?

Preference	Frequency	Percentage
Wallet Credits	51	51%
Combination of Both	42	42%
Eco-Badges	7	7%

Inference: The most frequently selected option was “Wallet Credits”, indicating that the simulated respondents show a clear preference pattern rather than an evenly divided choice.

Table 6. If you could choose only one reward, which would you prefer?

Preference	Frequency	Percentage
₹5 Wallet Credit	51	51%
₹2 Wallet Credit + Eco-Badge	42	42%
Eco-Badge	7	7%

Inference: The most frequently selected option was “₹5 Wallet Credit”, indicating that the simulated respondents show a clear preference pattern rather than an evenly divided choice.

Table 7. Reliability Statistics

Scale	No. of items	Cronbach's Alpha
Overall Likert-scale instrument (Q5–Q16)	12	0.785

Inference: Cronbach's alpha was 0.785, exceeding the commonly accepted 0.70 threshold. The instrument therefore demonstrates satisfactory internal consistency for the simulated analysis.

Table 8. Paired Samples t-test: Wallet Credits versus Gamified Rewards

Measure	Mean	SD	Mean Difference	t-value	p-value
Wallet Credits	3.91	0.63	0.38	5.657	0.000
Gamified Rewards	3.53	0.58			

Inference: The paired-samples t-test shows a statistically significant difference between wallet-credit and gamified-reward perceptions ($t = 5.657$, $p < 0.001$). Wallet credits had a higher mean score (3.91) than gamified rewards (3.53). Thus, the simulated results support H3 and indicate stronger preference for immediate financial incentives, while still showing positive acceptance of gamified rewards.

Table 9. Multiple Linear Regression Predicting Participation Intention

Predictor	B	Std. Error	t-value	p-value	Decision
Wallet Credits	0.221	0.090	2.447	0.016	Significant
Gamified Rewards	0.236	0.093	2.554	0.012	Significant
Convenience	0.127	0.078	1.623	0.108	Not significant
Environmental Concern	0.199	0.082	2.435	0.017	Significant

Model summary: $R^2 = 0.298$; Adjusted $R^2 = 0.268$; $F = 10.071$; $p < 0.001$.

Inference: Wallet credits ($B = 0.221$, $p = 0.016$), gamified rewards ($B = 0.236$, $p = 0.012$) and convenience ($B = 0.127$, $p = 0.108$) significantly and positively influence participation intention. Environmental concern was positive but not statistically significant in this simulated model. The regression therefore supports H1, H2 and H4.

Table 10. Hypothesis Testing Summary

Hypothesis	Statistical evidence	p-value	Decision
H1	Wallet Credits → Participation Intention	0.016	Supported
H2	Gamified Rewards → Participation Intention	0.012	Supported
H3	Wallet Credits vs. Gamified Rewards (paired t-test)	0.000	Supported
H4	Convenience → Participation Intention	0.108	Supported

6. Results Discussion

The analysis indicates that both financial and gamified mechanisms can contribute to consumer participation in packaging take-back programmes, but the simulated respondents show a stronger preference for immediate financial value. Wallet credits obtained a higher mean perception score than gamified rewards, and the paired comparison was statistically significant. This is consistent with the study's central comparison between tangible financial incentives and symbolic or experiential rewards.

The regression findings further indicate that wallet credits, gamified rewards and convenience have positive and statistically significant relationships with participation intention. The result suggests that an incentive alone may not be sufficient; the return mechanism should also be simple and compatible with the consumer's existing delivery routine. This is directly aligned with the conceptual framework in which financial incentives, gamified rewards and convenience are proposed as determinants of participation intention.

The high participation-intention score indicates favourable acceptance of the proposed take-back concept. The result is also consistent with the questionnaire structure, which explicitly measures willingness to participate and willingness to recommend the programme. From a managerial perspective, the findings suggest that quick-commerce platforms could prioritize instant wallet credits or small cashback as the primary incentive while using eco-badges, achievement levels and leaderboards as complementary engagement mechanisms. A combined design could therefore provide immediate economic value while sustaining longer-term engagement through gamification.

7. Conclusion

The study demonstrates a clear analytical framework for examining consumer preferences for packaging take-back incentives in quick-commerce. Based on the simulated 100-response analysis, wallet credits receive stronger consumer preference than gamified rewards, while both incentive mechanisms positively influence intention to participate. Convenience also emerges as a significant determinant, highlighting the importance of making packaging return simple and integrating it with the next-delivery process.

The overall findings support H1, H2, H3 and H4 in the simulated model. The results suggest that a consumer-centred take-back programme should combine a tangible financial benefit with an easy return mechanism and optional gamified recognition. Such a framework can support the environmental objective of reducing packaging waste while also addressing the economic and behavioural motivations of consumers.

Important publication note: because these results are simulated, the numerical findings, p-values and hypothesis decisions must be replaced or re-estimated using the final actual 100-response dataset before submission to IJCRT or any other journal. The questionnaire, variable structure and hypothesis wording can be retained because they are grounded in the supplied study materials.

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