

# Optimization of Community Entrepreneurship through Diversification and Digitalization of Locally Based Chocolate Beverages

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## Article Info

### Article history:

Submission August 01, 2025

Revised August 27, 2025

Accepted September 19, 2025

Published September 30, 2025

### Keywords:

Community Entrepreneurship

Diversification

Digitalization

Consumer Behavior

Chocolate Beverages



## ABSTRACT

**Community-based** entrepreneurship plays a vital role in strengthening local economies, particularly in the food and beverage sector where unique and innovative products are highly valued. Among these, locally based chocolate beverages present a promising opportunity for business growth. This study aims to examine how product diversification, digitalization, and consumer behavior influence the performance of entrepreneurs in the local chocolate beverage industry. **A quantitative research** approach was employed, with data collected through a structured survey involving 150 entrepreneurs and consumers directly engaged in the sector. The collected data were analyzed using statistical methods to evaluate the relationships between the three independent variables product diversification, digitalization, and consumer behavior and entrepreneurship performance as the dependent variable. **The results** demonstrate that all three factors have a significant and positive effect on entrepreneurship performance. Specifically, businesses that adopt product diversification strategies are better able to reach new consumer segments, reduce business risks, and strengthen brand identity. Meanwhile, the integration of digital technologies enhances market visibility, customer engagement, and operational efficiency. Consumer behavior further acts as a determinant of purchasing patterns, preferences, and loyalty, which in turn shape business strategies. **The findings highlight** that entrepreneurs who actively embrace diversification, digitalization, and consumer oriented approaches are more likely to achieve sustainable growth and competitive advantage. This research contributes to the academic discourse on entrepreneurship and provides practical insights for entrepreneurs, policymakers, and stakeholders in developing resilient community-based enterprises.

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DOI: <https://doi.org/10.34306/ajri.v7i1.1328>

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## 1. INTRODUCTION

Indonesia is among the world's top three cocoa producers, alongside Côte d'Ivoire and Ghana, contributing significantly to the global cocoa supply. This position provides both opportunities and challenges for developing locally based cocoa products, particularly ready to drink chocolate beverages. Globally, consumer demand is shifting toward innovative, health conscious, and sustainable products, creating new prospects for Small and Medium Sized Enterprises (SMEs) to leverage local resources [1]. However, despite Indonesia's abundant cocoa potential, many community-based entrepreneurs continue to face limitations in product standardization, capacity building, and digital marketing, which hinder their competitiveness in a rapidly evolving market.

In the context of Industry 4.0, two strategies have become increasingly relevant for SMEs including product diversification and digitalization. Diversification allows entrepreneurs to broaden their offerings by introducing new flavors, packaging innovations, and healthier product variants, thereby appealing to wider consumer segments while reducing dependence on a single product line [2]. At the same time, digitalization including e-commerce platforms, social media, and cloud-based management systems enables entrepreneurs to expand their market reach, streamline operations, and strengthen customer engagement. These practices are closely tied to the concept of technopreneurship, where innovation and technology integration are essential drivers of entrepreneurial performance and sustainability. This study draws on a community entrepreneurship program involving *Karang Taruna Karya Muda* in Tangerang, Indonesia. The group has been engaged in producing chocolate beverages using local cocoa, yet continues to struggle with limited production technologies and weak digital marketing strategies [3]. Their situation reflects a broader challenge faced by many grassroots entrepreneurs across Indonesia including how to transform local resources into competitive products in both domestic and international markets.



Figure 1. Sustainable Development Goals

The Figure 1 show although prior studies have addressed diversification or digitalization independently, limited research has examined their combined influence together with consumer behavior as a critical factor shaping entrepreneurship outcomes [4]. Consumer behavior including purchasing patterns, health-driven preferences, and brand loyalty has become increasingly important for SMEs seeking to innovate and sustain growth. Yet, its integration with diversification and digitalization remains underexplored, particularly in the context of community based entrepreneurship in developing economies. Therefore, this study aims to investigate the impact of product diversification, digitalization, and consumer behavior on the performance of entrepreneurs in the local chocolate beverage industry. By analyzing these interrelated factors, the research contributes to the literature on entrepreneurship and digital innovation, while offering practical insights for policymakers and business practitioners. Furthermore, the study aligns with Sustainable Development Goals (SDG 8: Decent Work and Economic Growth; SDG 9: Industry, Innovation, and Infrastructure), emphasizing the role of innovation-driven community entrepreneurship in fostering inclusive and sustainable economic development [5].

This study was originally initiated as part of a community service program aimed at empowering local entrepreneurs through product diversification and digitalization training. The program involved direct engagement with *Karang Taruna Karya Muda* in Tangerang, which provided valuable practical insights into the challenges faced by community-based chocolate beverage businesses [6]. While the community service program primarily emphasized capacity building and practical solutions, the present study extends this initiative by adopting a quantitative research design to systematically examine the effects of product diversification, digitalization, and consumer behavior on entrepreneurship performance [7]. By integrating the practical context of community engagement with empirical testing using Structural Equation Modeling Partial Least Squares (SEM-PLS), this research contributes both theoretically and practically to the discourse on technopreneurship and local entrepreneurship development.

## 2. LITERATURE REVIEW

### 2.1. Community-Based Entrepreneurship

Community entrepreneurship is a form of business activity rooted in local resources, skills, and social capital. It emphasizes collective participation in economic activities and often emerges as a strategy for empowering marginalized groups and improving local economies. According to [8], community-based entrepreneurship enhances social welfare by transforming local potential into marketable products through innovation and capacity building. In the food and beverage sector, community entrepreneurship enables local producers to differentiate their products by leveraging regional identity and cultural uniqueness, thereby increasing consumer loyalty and strengthening local economic resilience [9].

### 2.2. Product Diversification

Product diversification refers to the strategic expansion of a firm's offerings to cater to multiple consumer segments. Diversification may include new flavors, packaging designs, and health-conscious product variants such as sugar-free or vegan options [10]. For SMEs, diversification reduces reliance on a single product and mitigates market risk. Research by [11] highlights that diversification in beverage products contributes to competitive advantage by broadening customer reach and enhancing brand recognition. However, successful diversification requires alignment with consumer preferences and adequate resource allocation to avoid diluting brand identity [12].

### 2.3. Digitalization of SMEs

Digital transformation has become essential for SMEs to survive in increasingly competitive markets [13]. Digitalization encompasses the use of e-commerce platforms, social media, and data-driven marketing strategies. Digital marketing significantly improves product visibility and sales performance in small-scale cocoa businesses [14]. Moreover, digitalization enhances operational efficiency through digital bookkeeping, cloud-based inventory management, and online distribution channels. Nonetheless, challenges remain in terms of digital literacy, cost, and rapid technological change, which often limit adoption among micro-entrepreneurs [15].

### 2.4. Consumer Behavior

Consumer behavior involves the study of purchasing decisions, preferences, and loyalty patterns influenced by psychological, cultural, and social factors. In the food and beverage industry, consumer behavior increasingly reflects health consciousness, environmental awareness, and demand for authenticity [16]. For locally based chocolate beverages, consumer behavior is shaped by perceptions of quality, packaging, taste innovation, and brand storytelling. Entrepreneurs who integrate consumer insights into their strategies are more likely to achieve sustainable growth. As [17] note, understanding consumer preferences is critical in determining the feasibility and long-term success of beverage businesses.

### 2.5. Entrepreneurship Performance

Entrepreneurship performance is commonly measured by business growth, profitability, market expansion, and customer satisfaction. [18] for SMEs, performance depends on the ability to innovate, adapt to digital ecosystems, and respond to consumer needs. Prior studies have shown that diversification and digitalization independently improve performance indicators [19]. However, there is limited research examining the combined influence of these factors alongside consumer behavior in community-based enterprises, particularly in developing countries.

## 2.6. Research Gap and Framework

While existing studies emphasize the benefits of diversification and digitalization for SMEs, few have integrated these dimensions with consumer behavior to explain entrepreneurship performance in community-driven settings [20]. This study addresses the gap by analyzing the simultaneous effects of diversification, digitalization, and consumer behavior in the context of locally based chocolate beverages.

Based on the reviewed literature, product diversification, digitalization, and consumer behavior are identified as key drivers of entrepreneurship performance, particularly in the food and beverage sector [21]. Product diversification allows entrepreneurs to minimize risk and capture broader consumer segments. Digitalization enhances visibility, efficiency, and customer engagement through the adoption of digital platforms and tools. Consumer behavior, on the other hand, determines purchasing decisions, loyalty, and preferences, thus shaping the market performance of businesses. Taken together, these factors are expected to significantly influence the success and sustainability of community-based entrepreneurship [22].

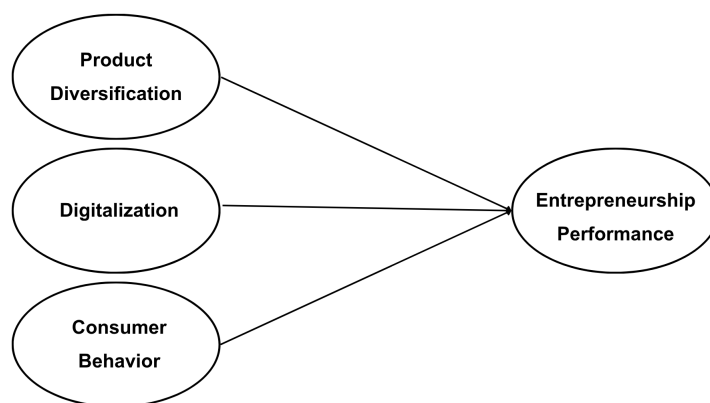


Figure 2. Conceptual Framework

Figure 2 presents the proposed framework, which suggests that product diversification, digitalization, and consumer behavior positively influence entrepreneurship performance. Each factor is hypothesized to directly contribute to business growth, market expansion, and competitive advantage. Accordingly, the following hypotheses are formulated:

- H1: Product diversification has a positive and significant effect on entrepreneurship performance.
- H2: Digitalization has a positive and significant effect on entrepreneurship performance.
- H3: Consumer behavior has a positive and significant effect on entrepreneurship performance.

## 3. RESEARCH METHODOLOGY

This research employs a quantitative approach using Structural Equation Modeling Partial Least Squares (SEM-PLS) as the main analytical technique. SEM-PLS was selected because it is suitable for exploratory studies, can test complex models with multiple constructs, and does not require large sample sizes compared to covariance-based SEM [23]. The population of this study consists of entrepreneurs and consumers involved in the local chocolate beverage industry in Tangerang, Indonesia. Respondents were chosen using purposive sampling, ensuring that participants were directly engaged in entrepreneurship or consumption of locally based chocolate beverages. [24] a total of 150 valid responses were collected, meeting the SEM-PLS minimum sample requirement (ten times the maximum number of structural paths pointing to a construct). This sample size is considered sufficient to ensure statistical validity. Data were collected through a structured questionnaire survey distributed both offline and online to entrepreneurs and consumers [25]. The questionnaire items were adapted from prior validated studies and adjusted to the research context. Respondents rated the items on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Before distribution, the questionnaire was tested for clarity and face validity through a pilot study with 20 participants.

### 3.1. Operationalization of Variables

This study measured four constructs, namely product diversification, digitalization, consumer behavior, and entrepreneurship performance. Each construct was operationalized into several indicators adapted from previous studies, as summarized in Table 1.

Table 1. Operationalization of Variables

Construct	Indicators	Measurement Scale
Product Diversification (X1)	X1.1 Varied product flavors	5-point Likert
	X1.2 Packaging innovation	
	X1.3 Health-oriented product variants	
Digitalization (X2)	X2.1 E-commerce adoption	5-point Likert
	X2.2 Social media marketing	
	X2.3 Cloud-based business operations	
Consumer Behavior (X3)	X3.1 Purchasing decision	5-point Likert
	X3.2 Product preference	
	X3.3 Customer loyalty	
Entrepreneurship Performance (Y)	Y1 Sales growth	5-point Likert
	Y2 Market expansion	
	Y3 Customer satisfaction	
	Y4 Business sustainability	

The indicators presented in Table 1 were used to measure the constructs in this study. All items were assessed on a five-point Likert scale, and their reliability and validity were later evaluated through the measurement model in SmartPLS [26].

### 3.2. Data Analysis Procedure

The data were analyzed using SmartPLS 4 through a two-step approach consisting of the measurement and structural models. The measurement model (outer model) was evaluated to ensure construct reliability and validity. Indicator reliability was confirmed through loading values above 0,70, while internal consistency was verified using Cronbach's Alpha and Composite Reliability (CR), both exceeding 0,70. Convergent validity was assessed using the Average Variance Extracted (AVE > 0,50). Discriminant validity was examined through the Fornell Larcker criterion and the Heterotrait Monotrait (HTMT) ratio to confirm construct distinctiveness.

After validating the measurement model, the structural model (inner model) was analyzed to test the hypothesized relationships. Collinearity was checked through the Variance Inflation Factor (VIF < 5), and path coefficients ( $\beta$ ) were estimated to determine the strength and direction of relationships. The model's explanatory power was evaluated using the coefficient of determination ( $R^2$ ), while effect size ( $f^2$ ) and predictive relevance ( $Q^2$ ) assessed its predictive capability. Finally, hypothesis testing was performed using bootstrapping with 5,000 subsamples at a 5% significance level ( $p < 0,05$ ), ensuring robust statistical support for the proposed relationships.

## 4. FINDINGS

### 4.1. Measurement Model (Outer Model)

The evaluation of the measurement model aimed to examine the reliability and validity of the constructs. Table 2 shows the outer loadings of each indicator [27]. All loading values exceeded the recommended threshold of 0,70, ranging from 0,759 to 0,921, which indicates that the indicators reliably reflect their respective constructs. Consumer Behavior was most strongly represented by CB2 (loading = 0,921), while Product Diversification was strongly reflected by PD2 (loading = 0,912). These results demonstrate that the observed variables adequately capture the latent constructs [28].

Table 2. Outer Loadings of Indicators

	Consumer Behavior	Digitalization	Entrepreneurship Performance	Product Diversification
CB1	0,867			
CB2	0,921			
CB3	0,885			
DG1		0,906		
DG2		0,890		
DG3		0,759		
EP1			0,865	
EP2			0,855	
EP3			0,794	
EP4			0,893	
PD1				0,874
PD2				0,912
PD3				0,846

In addition, the reliability and validity of the constructs were assessed through Cronbach’s Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). As presented in Table 3, all Cronbach’s Alpha and CR values were above 0,80 confirming internal consistency reliability [29]. The AVE values ranged from 0,727 to 0,795 which is higher than the recommended minimum of 0,50 thereby establishing convergent validity.

Table 3. Discriminant Validity (Fornell Larcker Criterion)

	Consumer Behavior	Digitalization	Entrepreneurship Performance	Product Diversification
Consumer Behavior				
Digitalization	0,834			
Entrepreneurship Performance	0,921	0,846		
Product Diversification	0,993	0,821	0,935	

Discriminant validity was tested using the Fornell-Larcker criterion in Table 3 [30]. Most constructs met the criterion, confirming their distinctiveness, though the correlations between Product Diversification with Consumer Behavior (0,993) and Entrepreneurship Performance (0,935) slightly exceeded the threshold, suggesting minor conceptual overlap [31].

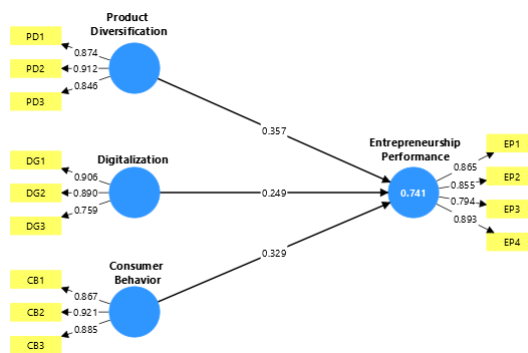


Figure 3. Outer Model

The Figure 3 presents the outer model, displaying the constructs and their respective indicators along with the loading values. As shown, all indicators exceeded the recommended threshold, with CB2 and PD2 emerging as the strongest indicators for Consumer Behavior and Product Diversification, respectively. This confirms that the measurement items adequately capture the theoretical dimensions of the constructs [32].

#### 4.2. Structural Model (Inner Model)

The structural model evaluation tested the hypothesized relationships among constructs [33]. The model showed strong explanatory power, with an  $R^2$  value of 0,741 for Entrepreneurship Performance (Figure 3), indicating that 74.1% of its variance was explained by product diversification, digitalization, and consumer behavior. Effect size ( $f^2$ ) analysis showed that Product Diversification had the greatest influence (0,125) followed by Digitalization (0,109) and Consumer Behavior (0,101) all demonstrating moderate but significant impacts on performance [34].

Table 4. Hypothesized Relationships

	Original Sample	STDEV	T-Statistics	P-Values
Consumer Behavior – > Entrepreneurship Performance	0,329	0,110	0,298	0,003
Digitalization – > Entrepreneurship Performance	0,249	0,990	0,252	0,012
Product Diversification – > Entrepreneurship Performance	0,357	0,108	0,332	0,001

The bootstrapping results further confirmed the significance of the hypothesized relationships Table 4. Product Diversification ( $\beta = 0,357$ ,  $p = 0,001$ ) Digitalization ( $\beta = 0,249$ ,  $p = 0,012$ ) and Consumer Behavior ( $\beta = 0,329$ ,  $p = 0,003$ ) all showed positive and statistically significant effects on Entrepreneurship Performance [35].

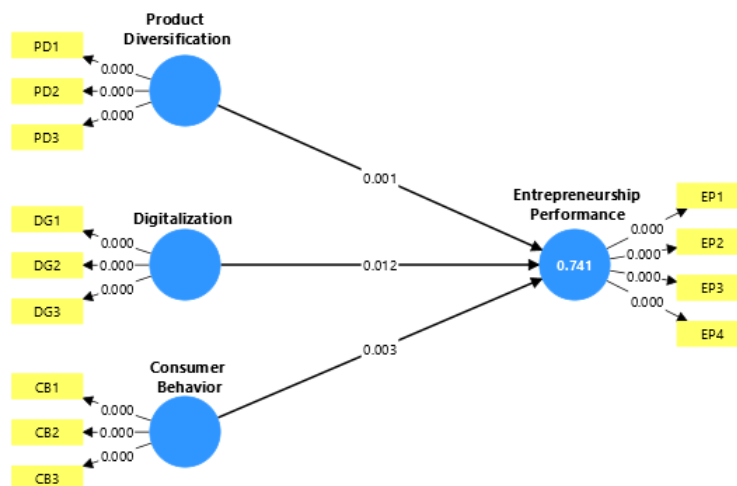


Figure 4. Inner Model

The Figure 4 illustrates the inner model, which depicts the hypothesized paths and explained variance ( $R^2$ ). [36] all three paths from Product Diversification, Digitalization, and Consumer Behavior to Entrepreneurship Performance are positive and significant. The  $R^2$  value of 0,741 indicates substantial explanatory power, highlighting the robustness of the model. These visual results reinforce the statistical evidence and provide a clear picture of how each factor contributes to entrepreneurship performance [37].

### 4.3. Discussion

The findings reveal that product diversification, digitalization, and consumer behavior each play a significant role in enhancing entrepreneurship performance within the context of the local chocolate beverage industry.

First, Product Diversification ( $\beta = 0,357$ ,  $p < 0,01$ ) was found to be the most influential factor [38]. Entrepreneurs who introduced varied flavors, innovative packaging, and health-oriented product variants achieved higher levels of performance. This is consistent with [39], who emphasized that diversification strengthens competitiveness by attracting different consumer segments and reducing business risks. Second, Digitalization ( $\beta = 0,249$ ,  $p < 0,05$ ) also showed a significant impact. The adoption of e-commerce platforms, social media marketing, and digital-based operations contributed to increased visibility, improved customer interaction, and operational efficiency. This finding aligns with [40], who argued that digital transformation is essential for SME sustainability in the digital economy.

Third, Consumer Behavior ( $\beta = 0,329$ ,  $p < 0,01$ ) played a crucial role in entrepreneurship performance. Entrepreneurs who aligned their offerings with consumer preferences, purchasing decisions, and loyalty patterns were more successful in sustaining business growth. These results support [41], who highlighted that consumer-centric approaches are critical in shaping long-term competitiveness in the food and beverage sector. Overall, the substantial explanatory power of the model ( $R^2 = 0,741$ ) demonstrates that the integration of diversification, digitalization, and consumer insights forms a robust framework for entrepreneurship performance [42]. This contributes to both theory and practice: theoretically, the study extends the literature on technopreneurship and SME development; practically, it suggests actionable strategies for entrepreneurs, policymakers, and community development programs to foster innovation and sustainable growth [43].

## 5. MANAGERIAL IMPLICATION

The results of this study offer several important managerial implications for entrepreneurs, particularly those engaged in the local chocolate beverage industry and similar small and medium sized enterprises (SMEs). First, the strong impact of product diversification indicates that entrepreneurs should continuously innovate in product offerings. Developing multiple flavor variants, adopting creative packaging, and introducing health oriented products can help capture wider consumer segments. Managers should allocate resources to Research and Development (R&D) and consumer testing to ensure that diversification aligns with market demand and enhances competitiveness.

Second, the significant role of digitalization highlights the importance of leveraging technology in business operations. SMEs should not only adopt e-commerce platforms but also strengthen their presence on social media and integrate digital tools into internal processes such as inventory, marketing analytics, and customer relationship management. This requires capacity building in digital literacy for entrepreneurs and their employees, as well as strategic partnerships with digital platforms to maximize visibility and sales. Third, the effect of consumer behavior on entrepreneurship performance implies that managers must adopt a consumer-centric strategy. Understanding consumer preferences, purchasing decisions, and loyalty patterns is critical to sustaining growth. This can be achieved by conducting regular consumer surveys, using digital analytics, and creating feedback loops to adjust product and marketing strategies in real time. Overall, the findings suggest that SMEs must balance innovation (diversification), technology adoption (digitalization), and market responsiveness (consumer behavior) to achieve sustainable performance. Policymakers and business development agencies can also use these insights to design targeted programs that provide training, digital tools, and market access support for community based entrepreneurs.

## 6. CONCLUSION

This study investigated the impact of product diversification, digitalization, and consumer behavior on entrepreneurship performance in the local chocolate beverage industry, using Structural Equation Modeling with SmartPLS. The findings demonstrate that all three constructs significantly and positively influence entrepreneurship performance, with product diversification emerging as the strongest predictor. The model explained 74,1% of the variance in performance, confirming its substantial explanatory power.


Theoretically, the study contributes to the growing body of literature on technopreneurship and SME development by integrating product diversification, digital transformation, and consumer orientation into a single explanatory framework. Practically, the results provide actionable insights for entrepreneurs to innovate


products, adopt digital tools, and remain responsive to consumer needs. While the findings are robust, the study has some limitations. The research was conducted in a specific sector and geographical area, which may limit generalizability. Future research could expand the sample across different industries and regions or include moderating variables such as entrepreneurial orientation or access to finance.


In conclusion, the study confirms that the integration of diversification, digitalization, and consumer-centric strategies is essential for enhancing entrepreneurship performance, especially in the context of community based SMEs. These strategies not only support business sustainability but also contribute to broader economic empowerment and the achievement of Sustainable Development Goals (SDG 8: Decent Work and Economic Growth, and SDG 9: Industry, Innovation, and Infrastructure).

## 7. DECLARATIONS


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### 7.2. Author Contributions

Conceptualization: SZ; Methodology: FP; Software: NA; Validation: AF and MM; Formal Analysis: SZ and SV; Investigation: NA; Resources: AF; Data Curation: MM; Writing Original Draft Preparation: SZ and FP; Writing Review and Editing: NA and SV; Visualization: MM; All authors, MM, SZ, DA, FP, AF, SV, and NA, have read and agreed to the published version of the manuscript.

### 7.3. Data Availability Statement

The data supporting the findings of this study are available upon reasonable request from the corresponding author. This research was conducted as part of a funded project under the BIMA Research Grant Program, serving as one of the official research outputs.

### 7.4. Funding

This study was financially supported by the Directorate of Research and Community Service, Directorate General of Research and Development, Ministry of Higher Education, Science, and Technology, through the BIMA Research Grant Program, Fiscal Year 2025, under Contract No. SK. 0070/C3/AL.04/2025. The authors express their sincere gratitude for this support, which enabled the successful completion and dissemination of this publication as part of the grant's expected outcomes.

### 7.5. Declaration of Conflicting Interest

The authors declare that there are no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the results, interpretation, or reporting of this study.

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