

RESEARCH ARTICLE

The mediating role of customer satisfaction for a sustainable e-banking performance

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ABSTRACT

Information and communication technologies have created a revolution in the approach of companies and customers. Digitalisation has led to the adoption of Electronic Banking worldwide befitting not only the user but also the banking industry. In this study primary data was collected from 374 participants using stratified random sampling. Using Smart PLS3 (Christian M.Ringle, Germany) and Structure Equation Modelling fitness of the model and reliability were derived, and this study has revealed that customer satisfaction affects retention which is directly influenced by efficiency, quality of service and reliability. It has revealed that for retaining customers when the mediator used is customer satisfaction, there is a significant impact of reliability, efficiency and service quality. Through these researches E-banking's four main components, that is, reliability of services, the quality of services rendered, satisfaction of customers and efficiency has been specified.

Keywords: e-banking, customer satisfaction, reliability, retention, service quality

1. Introduction

The competitive and dynamic current environment sees a never before seen technological advancement in all sectors. The banking sector is seeing unprecedented technological innovations, and Internet banking has overtaken the banking world. The Indian banking sector is not far behind and has seen a transformation beyond imagination owing to the technological transition that leads to sustainability^[1,2]. Furthermore, it has brought economic globalization to the country. The pressure on the Indian government to deploy Internet banking services has grown over the years^[3]. To keep the customer's data and online transactions secure, most Indian banks have included technologically robust yet customer-friendly facilities. The new age generation and most internet users in India execute their banking and financial transactions through online mode as it requires less time and is convenient. However, online banks impose risks like scams and fraudulent activities on clients. The Reserve Bank has outlined a two-step authentication process to ensure client safety and security.

The primary goal of both public sector and commercial banks is to make their lives easier for their customers and meet their expectations. The bank focuses on providing access to personal information and

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bill payments, statement information, and the ability to open accounts. Moreover, banks help customers with money transfers, loans, and rent payments. Banks offer easy payment of bills and enable customers to access the services anytime^[4,5]. Modern banks help merchants, money lenders, and landlords to borrow money and support the underprivileged part of Indian society. The credit creation system enables small industries with loans and helps the country's economy. Another essential objective of adapting online banking is to lower operating expenses. Customer satisfaction is multifunctional; contrarily in India, it is sparse and can be explored in different situations.

This research study aims to investigate different aspects that are ankle to encourage the larger section of the audience to use the online banking system. Various factors are explored concerning customer satisfaction, including performance, reliability, service quality, protection, quality of the network, and time. The main advantage of the online banking system is the "convenience of use" which saves time and money^[6]. Therefore, it is observed that there lies a direct association between the quality services provided by their bank and customer satisfaction. A bank needs to register trustworthiness in its customers' minds to increase customer engagement and satisfy their needs.

On the other hand, particular challenges connected with online banking include an increased risk of hacking and fraud. Frauds associated with online banking and stolen passwords make consumers vulnerable. Installing a system that safeguards passwords and information regarding financial transactions are essential for the banking sector^[7]. Commercial banks need more facilities like paying customers simultaneously, which reduces customers' inclination to engage with Internet banking facilities. Though the modern banking system has benefited society in many ways, there are certain drawbacks as well.

2. Review of literature

In the last decade, the banking sector has witnessed a drastic shift from the traditional to the electronic banking. The consumer base and Internet banking services have significantly flourished owing to advancement in technologies and innovation. According to the viewpoints of Bashir et al.^[8], new technologies have paved the way for the banking industry to present more up-to-date and accessible services to their customers. The online banking system has enabled consumers to check credit payments and monitor financial transactions and accounts. In addition, e-banking mode has empowered customers to indulge in payment swaps and other activities via smartphones. Mobile banking and e-banking are interchangeable terms that are commonly associated with online modes of banking.

E-banking services allow customers to connect with their financial accounts at their convenience. As per the opinions of Altobishi et al. [9], customization made in the mobile banking section is considered one important aspect that is related to mobile banking. The critical feature of Internet banking is the trustworthiness established by the organizations. Online banking is beneficial for both customers and the banks. It provides services at a much faster rate and in a simple manner as consumers can make a financial transaction from any part of the world. Furthermore, banks can communicate with clients and understand their demands [10]. The digital space of banking is highly competitive and banks are focused on retaining their customers. The rivalry has empowered the banks to incorporate innovative ways that meet customer expectations. The online portals are designed in a way that provides various opportunities for the clients to participate.

Customer satisfaction is defined as a model that facilitates significant and consistent results on the financial ability of banks. As per the comments of Beshir and Zelalem^[11], the Internet is one of the cost-effective delivery channels incorporated into the modern banking system. The banking industry has adopted an innovative approach where customers can access banking services without visiting the bank physically. It is observed that online banking has been more profitable when compared to the traditional

banking system. Customers are more inclined toward the online mode of banking considering it is cost-effective and saves time^[12]. Moreover, e-banking is quick and efficient and is gaining popularity among internet users. Digital transformation has made things easier for customers as they get access to banking services at their convenience. The 24-hour service associated with mobile banking has significantly influenced customer satisfaction. The competitive growing scenario of digital banking has compelled banks to constantly incorporate innovative approaches and retain their customers.

Online banking mode provides a convenient way for customers to conduct different banking operations from the comfort of their homes. According to the suggestions of Isibor et al.^[13], customer satisfaction is the extent to which customers are pleased with the capabilities and services of the organization. Customer satisfaction can be measured by conducting surveys and checking the ratings of products or services that enable the firm with information to understand the customer's point of view. Banks too have incorporated a feedback system to incorporate customer opinions and information regarding their experiences. This helps the banks with the necessary information to make improvements in their services. As per the findings of Ramesh et al.^[14], the quality of service provided by the banks is extremely important for customer retention. The reliability of the services and their quality are highly impactful toward customer satisfaction.

Services provided by e-banking systems help the firm to have a competitive advantage over its rival companies. High quality of service improves customer experience with the bank which is directly linked to an increase in customer engagement. Positive feedback from customers helps banks to take risks in the market and include innovative ideas and establish customer loyalty and establish a high service value. As per the workings of Hota^[15], enabling effective customer service that is quick enough to solve queries and issues promotes customer satisfaction. E-banking is developed by stressing tenability and reliability. In the banking industry, the ability to keep the customer satisfied and content is critical. Customers are often included in new products or trying that directly impact the overall growth of a bank. Therefore, it is crucial for banks to constantly improve their performance and meet the objectives of customer expectations. The quality of banking services is one of the important aspects that enable the banking sector to retain its customers^[16]. Additionally, the sector can establish customer loyalty programs to develop a committed consumer base. To stay active in the competition, banks need to upgrade their online banking services and connect with the customers' needs. Therefore, it is critically important for banks to know customer expectations and perceptions about their services.

3. Hypotheses

Reliability and efficiency can fulfill the agreements of tasks and be consistent throughout. According to the notions of Pambudi et al.^[6], financial operations are extremely significant aspects that highlight the prominence of using online mode of banking. Both efficiency and reliability are critical for customer satisfaction and retention. Banks need to simplify their process of e-banking system such that customers can understand and associate with each step^[17]. With online banking, customers need to be sure about the authenticity and security related to their details. This assurance illustrates the positive reputation of the bank in the minds of the customers. According to the opinions of Usman et al.^[4], customers well satisfied with the protection aspect related to online banking mode, are considered more satisfied. This results in customer retention and helps the bank grow in the dynamic business market.

Hypothesis 1 (H1). There exists a positive correlation between reliability and customer satisfaction and between efficiency and customer satisfaction.

Hypothesis 2 (H2). The impact of Reliability and efficiency is positive on retention of customers.

Banks' sustainability in this global competitive village is determined by their service quality. According to the views of Bashir et al.^[8], customers are well aware of the services provided by different banks. Therefore, it is extremely important to evaluate the quality of the e-banking services provided. The perspectives and expectations of customers need to be critically examined to expand the scope of banking services. Moreover, customer eagerness and dedication towards the services are cross-checked by banks before modifying existing banking services.

However, the quality of services critically impacts the trust and dependency shown by the consumers towards the services. As per the workings of Reddy^[12], service quality is considered the fundamental indicator of customer satisfaction. In addition to this, the security and protection of personal information and transaction details critically impact the perception of customers to stay associated with the bank. In case the criteria are not fulfilled, customers switch between banks to get the expected results. Banks must emphasize on customer satisfaction by increasing customer service quality, reliability, and efficiency.

Hypothesis 3 (H3). *Positive connectivity is observed between customer satisfaction and service quality.*

Hypothesis 4 (H4). A positive association is seen between service quality and retention of customers.

Satisfied customers are critical for the sustenance of every organization, as it promotes its overall growth in the market. As per the suggestions of Isibor et al.^[13], perceptions of customers over their choices are associated with the quality of service. Advancements in technologies have enabled the e-banking system to successfully incorporate the strategies that lead to customer satisfaction. A satisfied customer is seen to associate with the services over and over again, which expands the horizon for the bank in the competitive market^[18]. Therefore, it can be understood that service quality and customer satisfaction are linked with each other.

Since the profit of quality services can be measured, customer opinion and perceptions are given the highest priority by the banking sector^[19]. As per the critical analysis of Beshir and Zelalem^[11], customer knowledge and their journey with a service need to be properly analyzed before coming up with a new approach or service in the market. Customers willingly engage with services that are unique and meet their expectations in every possible way^[15]. The banking sector needs to include the feedback collected from customers for improving their services. This has shown a positive impact on customer satisfaction and helped an organization meet the competitive needs of the market. Sometimes customers are observed to be hesitant to engage with online banking services as they fear a loss of personal data and information^[7]. In that case, banks need to make them assured of the security policies and action plans that are taken by the bank to secure their details. Hence, it can be understood that customer retention is important and banks need to focus on customer satisfaction to develop a loyal base.

Hypothesis 5 (H5). Customer retention has a positive relationship with customer satisfaction.

Hypothesis 6 (H6). Customer satisfaction plays the role of a mediator between customer retention and reliability and efficiency.

Hypothesis 7 (H7). The relationship between retention of customers and quality of service is mediated by customer satisfaction.

4. Research methodology

This study mainly was explanatory with cross-sectional in nature. We conducted a survey method and analyzed the e-banking facilities' characteristics that would impact satisfaction, quality of service, and customer retention in the state of Odisha to figure out the influence of efficiency and dependability on

customer retention and satisfaction of the customer. The remaining set is separated into two parts: fundamental knowledge of customers and questions on the four e-banking service standards ("service quality, customer retention, efficiency and reliability, and customer satisfaction"). The online E-form was designed to get input from the respondents.

To evaluate customer satisfaction, a Likert Scale of five points was employed, with 5 to 1 as "Strongly Agree" to "Strongly Disagree". This study used a systematic sample selection. The sample was selected using inclusion and exclusion criteria to represent the target population accurately. The sample included 374 of 422 Odisha residents who received the forms, reflecting a diverse demographic. This sample was diversified by age and income. This diversity sought to capture perspectives on e-banking service quality and customer satisfaction, as age and income can significantly impact digital banking expectations and behaviors. This careful sample selection improves research representativeness.

4.1. Survey creation and tools

The research survey, essential to data collection, was carefully designed. A series of questions examined e-banking service quality and customer satisfaction. Each survey question was carefully crafted to meet research objectives. The survey's questions were theoretically grounded by drawing on field literature and theories. The survey was also pre-tested for validity and reliability. Pilot testing and expert reviews helped refine the study to collect research-related data.

4.2. Data analysis

This research utilized the powerful Structural Equation Modeling (SEM) framework for data analysis. Data analysis also relied on SmartPLS, a leading structural equation modeling software. These tools were carefully selected to meet the study's goals, allowing an in-depth examination of digital banking customer satisfaction factors and SmartPLS model assessment and validation.

5. Results and interpretation

The study comprised of two set of questions around 30. Demographic profile of the participants' as one component examined the, whereas the remaining has four sub-categories for predictor effects of e-banking service: "service quality, customer retention, efficiency and reliability, and customer satisfaction". A summarized technique of the "rating scale" was used to examine the information gathered from respondents. Despite the fact that there were 422 participants, only 374 were selected for the study to ease data processing. The program "SmartPLS 3" was used to undertake a quantitative assessment of the information.

5.1. Participant's descriptive information

This section provides a selection of the survey respondents. **Table 1** summarizes the results based on the demographic factors considered for the investigations. This section's material is sourced from primary channels. **Table 1** illustrates the respondents' population characteristics, comprising their age, educational, employment, gender, and income per month, between other factors. It demonstrates that the bulk responders are made up by males made up (63.71%), and the rest are female 36.29%. According to the poll findings, most of the participants (42.11%) were from the ages of 31–40, 37.22% were between 41–50 and rest 17.67% were more than 51 years of age.

Table 1. Respondents basic details.

Basis	Elements	Number	Percentage
Age	51 and above	66	17.67

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41-50	139	37.22
31-40	158	42.11
20-30	11	3.00
Professional Degree	85	22.64
P.G.	111	29.77
Grad.	126	33.81
U.G.	52	13.78
Students	43	11.44
Self employed	131	35.18
Private Job	81	21.66
Government Job	119	31.72
Male	238	63.71
Female	136	36.29
Above Rs 50,000	50	13.27
Rs 30,000-49,9999	148	39.64
Rs 10,001-29,999	112	29.86
Below Rs 10,000	64	17.23
	31-40 20-30 Professional Degree P.G. Grad. U.G. Students Self employed Private Job Government Job Male Female Above Rs 50,000 Rs 30,000-49,9999 Rs 10,001-29,999	31-40 158 20-30 11 Professional Degree 85 P.G. 111 Grad. 126 U.G. 52 Students 43 Self employed 131 Private Job 81 Government Job 119 Male 238 Female 136 Above Rs 50,000 50 Rs 30,000-49,9999 148 Rs 10,001-29,999 112

Upon education, 22.64% obtained a professional degree (PD), 29.77% were postgraduates (P.G), 33.81% had graduated (G), and 13.78% of participants were undergraduates (U.G). According to their job conditions, participants were categorized into four categories: students (11.44%), business or self-employed (35.18%), private employees (21.66%), and government employees (31.72%). In terms of average monthly income, 13.27% earned more than INR 50,000; 39.64% earned among INR 30,000 and 49,999; 29.86% earned within INR 10,001 and 29,999; and 17.23% of participants earned less than INR 10,000.

5.2. Evaluation of measurement models

"Internal consistency, discriminant validity and convergent validity" were used to validate the measurement scale.

Figure 1 depicts the latent constructs that comprise "service quality, customer retention, efficiency and reliability, and customer satisfaction". There are three that measure reliability and efficiency, four that measure customer satisfaction, four that measure retention, and five remark characters that measure service quality. The values of factor loading for every component or structure are presented beside the associated arrow.

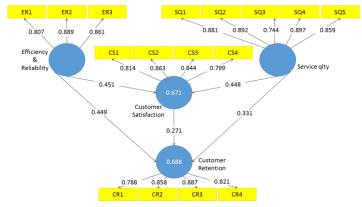


Figure 1. Model evaluation (PLS 3.0).

According to **Table 2**, whenever the values of mean for all elements in a construct surpass 3, it indicates a satisfactory reaction in "customer retention, efficiency and reliability, and service quality," in addition to the function of client satisfaction as a mediator. The study employed a Likert Scale of five points was employed, with 5 to 1 as "Strongly Agree" to "Strongly Disagree". Every construct contains elements with loadings of factors greater than the permitted threshold of 0.70. As a result, every remark discusses has its logically hypothesized construct in detail.

Table 2. Descriptive statistics.

Constructs	Elements	Std. Dev.	Mean	Loading	
Retention of customer	CR1	2.66	0.81	0.83	
	CR2	4.61	0.69	0.74	
	CR3	4.11	0.56	0.82	
	CR4	4.37	0.58	0.88	
Satisfaction of customer	CS1	3.02	0.67	0.79	
	CS2	2.98	0.49	0.88	
	CS3	4.61	0.67	0.76	
	CS4	3.98	0.89	0.74	
Reliability and efficiency	ER1	4.01	0.66	0.91	
	ER2	3.91	0.71	0.72	
	ER3	3.99	0.81	0.77	
Quality of service	SQ1	4.22	0.37	0.89	
	SQ2	3.71	0.71	0.90	
	SQ3	3.27	0.62	0.77	
	SQ4	3.98	0.91	0.81	
	SQ5	4.24	0.38	0.79	

As indicated in **Table 3**, all constructs passed the needed criteria threshold, as their "C.R" (Composite Reliability) and "A.V.E" (Average Variance Extracted) values were larger than 0.7 and 0.5 respectively. "Rho-a "Internal and "Cronbach's Alpha" proved the steadiness that were substantially larger than 0.7. As a consequence, the term "convergent validity" was coined Khan et al.^[17]

Table 3. Test of convergent validity.

Variables	Retention of customer	Satisfaction of customer	Reliability and efficiency	Quality of service
AVE	0.702	0.693	0.741	0.688
CR	0.922	0.901	0.879	0.837
Cronbach's Alpha	0.896	0.817	0.867	0.884
Rho-A	0.907	0.863	0.867	0.811

5.3. Validity finding (Discriminant)

The discriminant validity was confirmed through "Fornell-Larcker and cross-loading criteria" test. The degree by which the scale is suitably distinct from similar conceptions inside the latent variables is the purpose for the discriminant validity test. The study examined the square roots of the accessible constructions' "Average Variance Extracted" (see **Table 4**) to compute the "Fornell-Larcker" condition. To conclude, reliability and efficiency were larger than the correlation coefficients among service quality (0.822),

satisfaction (0.811), retention (0.827), and individual components (0.861). Ultimately, the "Fornell-Larcker" criteria were used to prove discriminant validity^[18].

Table 4. Test of Discriminant Validity by Fornell-Larcker.

Variables	Retention of customer	Satisfaction of customer	Reliability and efficiency	Quality of service
1	0.791			
2	0.749	0.782		
3	0.741	0.774	0.753	
4	0.862	0.841	0.817	0.822

According to **Table 5**, all constructs had larger loadings than most other constructs' cross-column cross-loadings. As a consequence, the cross-loading criteria were used to establish discriminant validity^[19].

Table 5. Loading and cross loading (Discriminant Validity).

Constructs	Elements	Retention of Customer	Satisfaction of Customer	Reliability and Efficiency	Quality of Service
Customer retention	CR1	0.791	0.705	0.792	0.681
	CR2	0.826	0.523	0.826	0.596
	CR3	0.954	0.740	0.855	0.780
	CR4	0.811	0.697	0.811	0.620
Customer satisfaction	CS1	0.681	0.822	0.625	0.725
	CS2	0.558	0.868	0.721	0.571
	CS3	0.697	0.846	0.569	0.602
	CS4	0.691	0.770	0.756	0.620
Efficiency and reliability	ER1	0.712	0.625	0.777	0.714
	ER2	0.690	0.718	0.854	0.572
	ER3	0.670	0.654	0.847	0.686
Service quality	SQ1	0.591	0.642	0.617	0.811
	SQ2	0.711	0.567	0.687	0.820
	SQ3	0.703	0.652	0.701	0.771
	SQ4	0.720	0.576	0.580	0.829
	SQ5	0.642	0.660	0.720	0.770

5.4. Structural equation model

In order to acquire reliable findings, it was required to take multi-collinearity into account when analysing the structural model. The model lacked multi-collinearity as the range varies from 1.662 to 2.371 "Variance Inflation Factor" (VIF).

Bootstrapping (3000 resamples) was employed to evaluate the hypothesis's relevance in assessing the model's structural strength. **Figure 2** of the PLS-SEM model shows each route was substantial level at 5% and above that is when the t-values surpassed the predefined of 1.96 limit in regression weight, it means the estimated path parameter was significant). **Table 6** displays the findings of the SEM model.

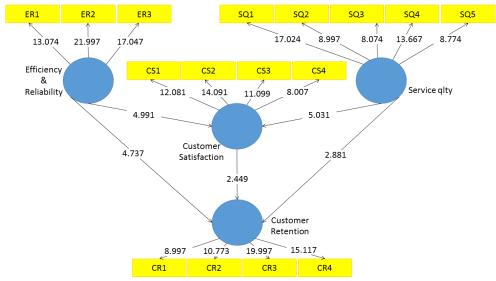


Figure 2. SEM (Structured Equation Model).

Table 6. Impact study of efficiency and reliability and the service quality (Directly).

Hypothesis	H1	H2	Н3	H4	Н5
Path	SQ -> CS	SQ-> CR	ER-> CS	ER-> CR	CS->CR
p-value	*	**	*	*	**
t-value	4.711	2.621	4.291	4.882	2.617
β	0.472	0.281	0.437	0.432	0.263
Result	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed

Note: * at 1% level & ** at 5% level.

All the hypotheses that are considered were all confirmed, as shown in **Table 6**. Consumer retention was also positively and directly associated to service quality (t = 2.621; p < 0.005 and $\beta = 0.281$). Satisfaction of consumer was also positively and directly associated to service quality (t = 4.711, p < 0.001 and $\beta = 0.472$). Likewise, reliability and efficiency were shown to be positively and directly connected to customer satisfaction (t = 4.291, p < 0.001 and $\beta = 0.437$). Consumer retention were also positively and directly associated to efficiency and reliability (t = 4.882, p < 0.001 and $\beta = 0.432$). However, satisfaction was found to be positively and directly connected to client retention (t = 2.617, t = 0.005 and t = 0.263).

The rest hypotheses (H06 and H07) were confirmed, as shown in **Table 7**. Satisfaction exhibited an influence on customer retention in terms of service quality with an indirect and mediated effect (t = 2.461; p < 0.005 and $\beta = 0.207$). In the instance of reliability and efficiency, customer satisfaction showed a mediating or indirect influence on credibility (t = 2.317, p < 0.005 and $\beta = 0.087$).

Table 7. Impact study of satisfaction (Mediating effect or indirect effect).

Hypothesis	Н6	Н7
Path	SQ->CS->CR	ER->CS->CR
<i>p</i> -value	**	**
t-value	2.461	2.317
β	0.207	0.087
Result	Confirmed	Confirmed

Note: * at 1% level & ** at 5% level.

6. Conclusion

The research has tried to comprehend the effect of e-banking service quality on the satisfaction of customers. The results have depicted that e-banking service quality has motivated customers to continue their relationship with their banks because of the satisfaction they have derived from the service quality. In this research, the mediating role played by customer satisfaction has been studied to highlight the satisfaction level impact and future retention of the customers. It has been observed that as a mediator, customer satisfaction along with efficiency and reliability play a very significant part and has thus helped to retain customers for the long term, particularly in the banking industry. With the customer becoming more and more updated and intelligent with regard to the technological innovations in the banking sector, their expectations from banks in terms of service quality are also touching the peak. This study will help to understand the banking industry's initiative towards adapting emerging technologies for its best advantage. The results of the current study provide the theoretical foundation for analyzing e-banking and technical advancements connected to e-banking, which is vital for banks to recognize how consumers are influenced by the degree of online banking services that are accessible to them. The study technique may be used by banks to determine how their clients feel about online banking and to enhance their services. This paper brings to light the importance of investing in technological for ensuring smooth operations which is very essential for meeting customers' expectations and satisfaction. As opined by Hota^[15], customer satisfaction is the key to a banks success and the banks should prioritize efficiency and reliability of their banking system. Understanding the mediating role of customer satisfaction can guide banks in strategizing their efforts. When focusing on improving service quality, banks should consider how these improvements affect customer satisfaction, which, in turn, impacts customer. Banks need to understand the practical implication of providing high quality online banking services for cutting ahead of the competitive circle.

Although this study has certain shortcomings, such as it is specifically related to the banking industry and cannot be generalized, yet can be a feeder for future research. Banking services have to be constantly improved taking into account the technological advancements and unstable customer requirements. Thus efficiency, reliability, customer retention, and customer satisfaction all have practical implications in the banking industry in its search for maintaining and retaining loyal customers.

Author contributions

Conceptualization, SLH and AK; methodology, AK; software, SLH and SM; validation, TS and ADR; formal analysis, AK and SM; investigation, TS and ADR; resources AK; data curation, SLH; writing—original draft preparation, SM, SLH and AK; writing—review and editing, SLH and AK. All authors have read and agreed to the published version of the manuscript.

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Ethics approval and consent to participate

The research conducted by AK, SLH, and SM received approval from the Internal Review Board for Research KIIT Deemed to be University, BBSR, and India. The approval number for the study is KIIT-DU/KSFH/2023/454 (A).

Conflict of interest

The authors declare no conflict of interest.

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