



The post-COVID-19 pandemic fitness landscape: determinants of fitness participation in commercial gyms in Indonesia

El panorama del fitness tras la pandemia de COVID-19: factores determinantes de la participación en gimnasios comerciales en Indonesia

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Abstract

Introduction and Objective: The COVID-19 pandemic changed physical activity behaviour worldwide, promoting home exercise and the use of digital platforms. In the post-pandemic context, this study aims to analyse the factors influencing the return of the Indonesian population to commercial gyms, considering health awareness, perceived safety, digital fitness experience, social motivation, and service quality.

Methodology: An explanatory quantitative approach with a cross-sectional design was employed. Data were collected from 1,040 active gym members in several major cities in Indonesia and analysed using the partial least squares structural equation modelling (PLS-SEM) approach.

Results: The results indicate that the model explains 57.1% of the variance in participation in fitness activities. All hypothesised relationships were statistically significant. Service quality was the strongest predictor, followed by perceived safety and health consciousness. Social motivation indirectly influenced participation through improved service quality, while digital fitness experience strengthened the relationship between perceived safety and participation.

Conclusion: Fitness participation in the post-pandemic stage in Indonesia is determined by the interaction of health, safety, digital, social, and service factors, highlighting the need for integrated strategies to revitalise the fitness industry.

Keywords

Fitness participation, post-COVID-19, commercial gyms, Indonesia; PLS-SEM.

Resumen

Introducción y Objetivo: La pandemia de COVID-19 modificó el comportamiento de la actividad física a nivel mundial, impulsando el ejercicio en el hogar y el uso de plataformas digitales. En el contexto pospandémico, este estudio tiene como objetivo analizar los factores que influyen en el retorno de la población indonesia a los gimnasios comerciales, considerando la conciencia sobre la salud, la percepción de seguridad, la experiencia de fitness digital, la motivación social y la calidad del servicio.

Metodología: Se empleó un enfoque cuantitativo explicativo con un diseño transversal. Los datos se recopilaron de 1.040 miembros activos de gimnasios en varias ciudades principales de Indonesia y se analizaron mediante el modelo de ecuaciones estructurales de mínimos cuadrados parciales (PLS-SEM).

Resultados: Los resultados indican que el modelo explica el 57,1 % de la varianza de la participación en actividades de fitness. Todas las relaciones hipotetizadas fueron estadísticamente significativas. La calidad del servicio fue el predictor más fuerte, seguida de la percepción de seguridad y la conciencia sobre la salud. La motivación social influyó indirectamente en la participación a través de la mejora de la calidad del servicio, mientras que la experiencia de fitness digital fortaleció la relación entre la percepción de seguridad y la participación. **Conclusión:** La participación en el fitness en la etapa pospandémica en Indonesia está determinada por la interacción de factores de salud, seguridad, digitales, sociales y de servicio, lo que resalta la necesidad de estrategias integradas para revitalizar la industria del fitness.

Palabras clave

Participación en actividades físicas, después de la COVID-19, gimnasios comerciales, Indonesia; PLS-SEM.

Introduction

The COVID-19 pandemic has significantly altered global lifestyle patterns, especially in terms of physical activity and health behaviors. Regional quarantines, social distancing policies, and prolonged closures of fitness facilities led to a sharp decline in the number of gym visitors, resulting in many people switching to home and digital fitness alternatives (Chtourou et al., 2020; García-Fernández et al., 2018). As the pandemic subsides and society transitions to the post-pandemic era, understanding the drivers of fitness participation in commercial gyms is important, especially in middle-income countries like Indonesia, where gym-based fitness is growing rapidly but is still under-researched (Urban et al., 2025).

Several studies have proven the important role of health awareness in motivating individuals to engage in postpandemic fitness routines (Chou & Lee, 2023; Pu et al., 2020). At the same time, the perception of safety, especially related to ventilation, hygiene, and physical distancing, has been a determining factor influencing the return of activity in the gym (Bu et al., 2021; Falese et al., 2025). Furthermore, the pandemic introduced or increased reliance on digital fitness experiences, including mobile fitness apps and virtual workouts, which are now impacting expectations and satisfaction with in-person fitness services (Sharma et al., 2024; Thompson, 2023).

In addition, social motivation as an emotional reason for people to participate in physical activity has emerged as an important determinant post-pandemic. The absence of face-to-face interaction during regional quarantine has revived interest in fitness environments that involve social interaction, such as gym communities or group workouts (Lau et al., 2022; Zaccagni et al., 2021). Combined with these personal and social factors, the quality of fitness center services, which includes embodiment, empathy, and responsiveness, continues to be a predictor of member satisfaction and retention (García-Fernández et al., 2016).

However, despite the overwhelming literature on fitness motivation and fitness center service quality, some studies have attempted to develop a comprehensive post-pandemic framework that integrates personal, digital, social, and environmental variables into a single, empirically tested model. In addition, empirical studies from Southeast Asia, particularly in Indonesia, are still limited (Jiang et al., 2025). This study addresses this gap by examining the simultaneous and interconnected effects of five key factors including health awareness, safety perception, digital fitness experience, social motivation, and fitness center service quality on fitness participation in commercial gyms in Indonesia. Therefore, this study was guided by research questions including: (1) To what extent does health awareness affect participation in gyms post-pandemic?, (2) How does perception of safety influence the decision to return to gym based fitness?, (3) What impact does digital fitness experiences have on re-engagement in gyms?, (4) How does social motivation shape participation rates in commercial gyms?, (5) How does the quality of fitness center services affect fitness participation, either directly or indirectly through other variables?, (6) To what extent do these five variables simultaneously predict fitness participation in the post-pandemic fitness landscape?

In answering these questions, the study has proposed the following hypotheses: H1: Health awareness has a positive effect on safety perception, H2: Health awareness directly affects fitness participation, H3: Safety perception positively influences fitness participation., H4: Digital fitness experiences positively moderate the influence of safety perception on participation, H5: Digital fitness experiences directly affect fitness participation, H6: Social motivation has a positive effect on the quality of fitness center services, H7: The quality of fitness center services has a positive effect on fitness participation, H8: Social motivation and the quality of fitness center services together affect fitness center participation, H9: These five variables significantly affect fitness center participation after the pandemic.

The novelty of this study lies in the integrated conceptual framework and context-specific empirical testing in the Indonesian fitness center market. These findings are expected to provide insights for fitness center operators, policymakers, and health behavior researchers in navigating the ever-changing landscape of physical activity in the post-pandemic era.

Method

This study applies an explanatory quantitative approach to examine the influence of personal, digital, social, and service factors on the level of community participation in commercial gyms in Indonesia in the post-pandemic period. This study uses Partial Least Squares Structural Equation Modeling (PLS-SEM) as the main analysis technique to test predictive models with multiple constructs, non-normal data (Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, 2014).

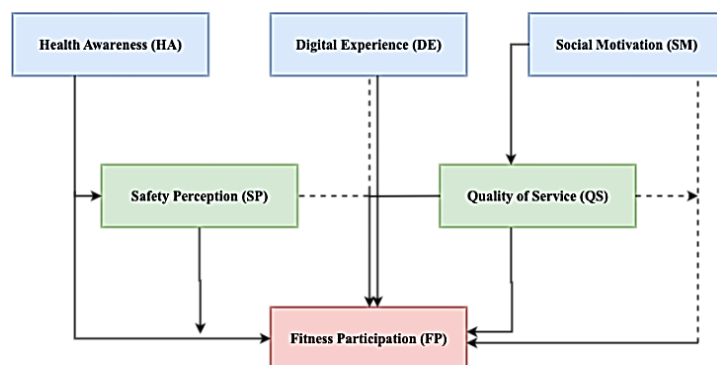
Participants

The study population consisted of active gym members aged 18-60 years in several major cities in Indonesia such as Surabaya, Jakarta, Medan, Makassar and Denpasar. Using purposive sampling, 1040 respondents were selected based on criteria: (1) active gym members for at least three post-COVID-19 months, (2) experience with digital and in-person fitness, and (3) consent to participate.

Research Design

Data were collected using structured questionnaires adapted from validated sources. All items are rated using a 5-point Likert scale. The constructs used include: (1) Health Awareness (Chou & Lee, 2023), (2) Safety Perception (Falese et al., 2025), (3) Digital Fitness Experience (Sharma et al., 2024), (4) Social Motivation (Lau et al., 2022), (5) Gym Service Quality [15] (Wisutwattanasak et al., 2023), (6) Fitness Participation (Pu et al., 2020). Trials ($n = 50$) confirm the validity and reliability of the item. All constructions exhibit acceptable internal consistency ($\alpha > 0.70$). Data was collected over 3 months in mid-2025 through online and in-person surveys. The data was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS4. The analysis was carried out through two stages: measurement model assessment (validity, reliability, discriminant validity) and structural model assessment (path coefficient, R^2 , f^2 , and bootstrapping). Model fit (SRMR, NFI), multicollinearity, and general method bias were also evaluated (Henseler et al., 2016). The conceptual framework of the research can be seen in (Figure 1).

Figure 1. Construct Research of The Post-COVID-19 Pandemic Fitness Landscape: Determinants of Fitness Participation in Indonesian Commercial Gyms



Statistical analysis

This analysis consists of two stages. First, the measurement model was evaluated for internal consistency (Cronbach α , composite reliability), convergent validity (AVE), and determinant validity (HTMT). Second structural models were assessed by examining the path coefficient (β), determination coefficient (R^2), effect size (f^2), and using bootstrapping (Hair et al., 2017; Sarstedt & Liu, 2024). As an important first step before model analysis, multicollinearity checks are checked through variance inflation factor (VIF), with a VIF threshold of < 3.3 to ensure the absence of redundant indicators (Ned Kock, 2015). Model suitability was evaluated using standard squared mean root residue (SRMR) and normized conformity index (NFI). These measures ensure that the measurement and structural aspects of the model meet acceptable psychometric standards for publication in high-impact media.

Results

Analysis results from the Post-COVID-19 Pandemic Fitness Landscape: Determinants of Fitness Participation in Indonesian Commercial Gyms in the form of a table (1) Data description, (2) Evaluation of Measurement Model (Outer Model) which includes the results of Convergent Validity and Construct Reliability, as well as discriminant test (HTMT Ratio) (3) Results of Structural Model Evaluation (Inner Model) which includes Multicollinearity Test, VIF (Variance Inflation Factor) Value, Direct Relationship Test (H1, H2, H3, H5, H6, H7), Moderation Effect Test (H4), Joint Influence Test (H8) and Model Prediction Test (H9), (4) Model Quality Evaluation Analysis (Goodness of Fit) which includes SRMR (Standard Root Average Square Residue) and NFI (Norm Conformance Index), and (5) Additional Analysis which includes Determination Coefficient (R^2), Effect Size (f^2) and hypothesis testing with bootstrapping are shown in the following order:

Table 1. Number of male and female respondents participating in fitness in commercial gyms (N = 1040)

Gender	Amount	Percentage
Man	416	40%
Woman	624	60%
Total	1040	100%

The questionnaire distribution stage succeeded in capturing 1040 respondents from five cities, namely Surabaya, Jakarta, Medan, Makassar and Denpasar. As shown in Table 1, of the total respondents, 416 were men (40%), while 624 people were women (60%). This data shows that the majority of respondents in this survey are women, with a more dominant number than men.

From the table above, it is emphasized that women show greater interest in participating in gym-based activities post-pandemic. This trend can be attributed to increased health awareness among women, a preference for a supportive social environment, and a motivation to maintain fitness through group classes and structured programs that many commercial gyms offer. These findings highlight that the women's segment is a strategic target group in the development of fitness center services and marketing.

Table 2. Distribution of respondents by age (n = 1040)

Age	Amount	Percentage
17-35 years old	468	45%
36-45 years old	260	25%
46-55 years old	208	20%
>56 years old	104	10%
Total	1040	100%

Based on age categories, the majority of respondents were in the productive age range of 17-35 years with a total of 468 people (45%). The next age category was 36-45 years old with 260 people (25%), then 46-55 years old with 208 people (20%), and finally 104 respondents aged >56 years old with 104 people (10%).

Table 3. Distribution of respondents by type of job (n = 1040)

Work	Amount	Percentage
Student/Student	260	25%
Private Employees	364	35%
Government Employees	208	20%
Businessman	156	15%
Other	52	5%
Total	1040	100%

In terms of the type of work seen from Table 3, most of the respondents were private employees with a total of 364 people (35%), followed by students/students as many as 260 people (25%). Furthermore, 208 government employees (20%), entrepreneurs 156 people (15%), and other categories (e.g. housewives, freelancers, or non-workers) as many as 52 people (5%).

Table 4. Evaluation Results of Measurement Model (Outer Model) Convergent Validity and Construct Reliability (n = 1040)

Construct	Items	Outer Loading	CR	AVE	Cronback's Alpha	Information
Health Awareness (HA)	HA1	0.84	0.927	0.718	0.894	Valid & Reliable
	HA2	0.86				
	HA3	0.83				
	HA4	0.85				
Security Perception (SP)	SP1	0.82	0.901	0.696	0.863	Valid & Reliable
	SP2	0.85				
	SP3	0.81				
	SP4	0.84				
Digital Experience (DE)	DE1	0.78	0.882	0.652	0.831	Valid & Reliable
	DE2	0.81				
	DE3	0.83				
	DE4	0.80				
Social Motivation (SM)	SM1	0.79	0.889	0.667	0.842	Valid & Reliable
	SM2	0.83				
	SM3	0.82				
	SM4	0.81				
Quality of Service (QS)	QS1	0.85	0.918	0.737	0.882	Valid & Reliable
	QS2	0.87				
	QS3	0.86				
	QS4	0.85				
Fitness Participation (FP)	FP1	0.82	0.910	0.719	0.871	Valid & Reliable
	FP2	0.86				
	FP3	0.85				
	FP4	0.84				

Based on Table 4, all constructions in the research model were declared valid and reliable, making them suitable for further hypothesis testing. Convergent validity is measured from the outer loading value and the Average Variance Extracted (AVE). All indicators have an outer loading value above 0.70, which indicates that each item is highly correlated and accurately measures its construction. In addition, the AVE value for all constructions is above the critical limit of 0.50 (ranging from 0.652 to 0.737). This proves that more than 50% of the variants of this indicator can be explained by their constructs, so that the convergent validity is met.

In terms of reliability, both Composite Reliability (CR) and Cronbach's Alpha for the entire construction were well above the recommended limit of 0.70. A high CR value (between 0.882 and 0.927) indicates excellent internal consistency between the indicators in measuring their constructs. This result is reinforced by the also high Alpha Cronbach value (between 0.831 and 0.894), which confirms that the measurement instrument is stable and reliable.

Table 5. Discriminant Test Results (HTMT Ratio) (n = 1040)

Construct	HA	SP	DE	BC	QS	FP
Health Awareness (HA)	-					
Security Perception (SP)	0.42	-				
Digital Experience (DE)	0.38	0.35	-			
Social Motivation (SM)	0.31	0.29	0.33	-		
Quality of Service (QS)	0.46	0.41	0.37	0.52	-	
Fitness Participation (FP)	0.51	0.48	0.42	0.45	0.59	-

Based on the results of the discriminant test presented in Table 5, it can be concluded that all constructions in this study meet the criteria for discriminant validity. The Heterotrait-Monotrait Ratio (HTMT) values for all construct pairs, such as between Health Awareness (HA) and Fitness Participation (FP) 0.51, and between Quality of Service (QS) and Fitness Participation (FP) 0.59, were below the conservative threshold value of 0.85 (Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, 2014). This provides strong empirical evidence that each construction is unique and conceptually different from each other, so the measurements for each construction do not overlap.

Overall, the results of this HTMT ratio confirm that the measurement model has excellent discriminant validity. This means that respondents can clearly distinguish between one construction and another, for example between Social Motivation and Security Perception (HTMT value 0.29). Thus, these research instruments are not only valid and reliable internally (as evidenced in Table 4), but also able to distinguish various concepts that are strictly measured.

Table 6. Results of Structural Model Evaluation (Inner Model)

Hypothesis	Correlation	Path Coefficient (β)	T-Statistics	P-Value	Results	VIVID
H1	HA \rightarrow SP	0.43	8.958	0.000	Accepted	1.23
H2	HA \rightarrow FP	0.22	4.314	0.000	Accepted	1.31
H3	SP \rightarrow FP	0.28	5.714	0.000	Accepted	1.42
H5	THE \rightarrow FP	0.19	3.654	0.000	Accepted	1.25
H6	SM \rightarrow KL	0.51	12.439	0.000	Accepted	1.00
H7	QS \rightarrow FP	0.34	6.800	0.000	Accepted	1.38
H4	HAA--DE \rightarrow FP	0.31	6.596	0.000	Accepted	1.45

Table 7. Results of the Model Prediction and Joint Influence Test (n = 1040)

Construct	R ²	f ²	Information
Security Perception (SP)	0.185	0.226	Small influence
Quality of Service (QS)	0.260	0.351	Big influence
Fitness Participation (FP)	0.571	-	Substantial influence
H8: SM+QS \rightarrow FP	0.39	0.152	Influence of medium
H9: Overall Model	0.571	-	Strong predictions

Description: p < 0.01; p < 0.05 (two-tailed)

Based on Table 6, all research hypotheses (H1-H7 and H4) were proven to be statistically significant (p < 0.01) with a positive and statistical T-line coefficient value of > 1.96, where social motivation (SM) had the strongest influence on service quality ($\beta = 0.51$) and service quality (QS) was the most dominant predictor of fitness participation ($\beta = 0.34$), while the effect of digital experience moderation (HA--DE) also significantly strengthened the influence of safety perception on fitness participation ($\beta = 0.31$). Furthermore, Table 7 reveals that the model as a whole has substantial predictive power with a value of R² = 0.571 for fitness participation, which suggests that 57.1% of the variance in fitness participation can be explained by all five independent variables together, with effect sizes (f²) varying from small to large where social motivation contributes the greatest to quality of service (f² = 0.351).

Table 8. Goodness of Fit Test Results (n = 1040)

Fit Index	Value	Threshold	Information
SRMR (Standardized Root Mean Square Residual)	0.05	<0.08	Good
NFI (Normed Fit Index)	0.92	>0.90	Good
Chi-Square	1215.2	-	-
RMS Theta	0.12	<0.12	Marginal

Based on Table 8, the value of this research model has met the Goodness of Fit (GoF) criteria or has a good match with empirical data. The SRMR (Standard Average Root of Residue Squared) of this model is 0.05. This value is below the strict threshold limit of 0.08, which indicates that the difference between the correlation matrix predicted by the model and the observational data correlation matrix is minimal. In other words, the model we created accurately replicates the observed data. Then the NFI (Normed Fit Index model) shows a value of 0.92. This value has exceeded the recommended minimum limit of 0.90. A value of 0.92 means that this model is 92% better at explaining data compared to the null model.



Table 9. Additional Analysis Results: Coefficient of Determination (R^2) and Effect Size (f^2) (n = 1040)

Endogenous variable	R^2	Interpretation of R^2	Correlation	f^2	Interpretation f^2
Security Perception (SP)	0.185	Weak	HA → SP	0.226	Small
Quality of Service (QS)	0.260	Weak	SM → QS	0.351	Large
Fitness Participation (FP)	0.571	Moderate	HA → FP	0.042	Small
			SP → FP	0.061	Small

Based on the results of the analysis in Table 9, it can be interpreted that this study model shows moderate predictive power for the fitness participation variable ($R^2 = 0.571$), which shows that 57.1% of the fitness participation variance can be explained together with the variables of health awareness, safety perception, digital experience, and quality of service. Although the R^2 values for security perception (0.185) and quality of service (0.260) fall into the weak category, these findings remain significant in the context of the overall model.

Furthermore, in terms of effect size (f^2), the results of the analysis showed that most of the individual influence variables fell into the small category, with the highest value on the relationship between social motivation and quality of service ($f^2 = 0.351$) falling into the large effect category. This confirms the important role of social motivation in encouraging the improvement of the quality of fitness center services. Meanwhile, the influence of other variables such as health awareness on participation ($f^2 = 0.042$) and digital experience on participation ($f^2 = 0.031$) was smaller, but still statistically significant.

Table 10. Summary of Hypothesis Testing Results with Bootstrapping (n = 1040)

Hypothesis	Correlation	B	T-Statistics	Results	Interpretation of the Power of Influence
H1	HA → SP	0.43	8.958	Accepted	Strong positive influence
H2	HA → FP	0.22	4.314	Accepted	Significant positive influence
H3	SP → FP	0.28	5.714	Accepted	Significant positive influence
H4	SP-DE → FP	0.31	6.596	Accepted	Strong moderation effect
H5	THE → FP	0.19	3.654	Accepted	Significant positive influence
H6	SM → QS	0.51	12.439	Accepted	Very strong influence
H7	QS → FP	0.34	6.800	Accepted	The most dominant influences
H8	SM+QS → FP	0.39	7.358	Accepted	Significant co-influence
H9	Model → FP	0.571	-	Accepted	Strong model predictions

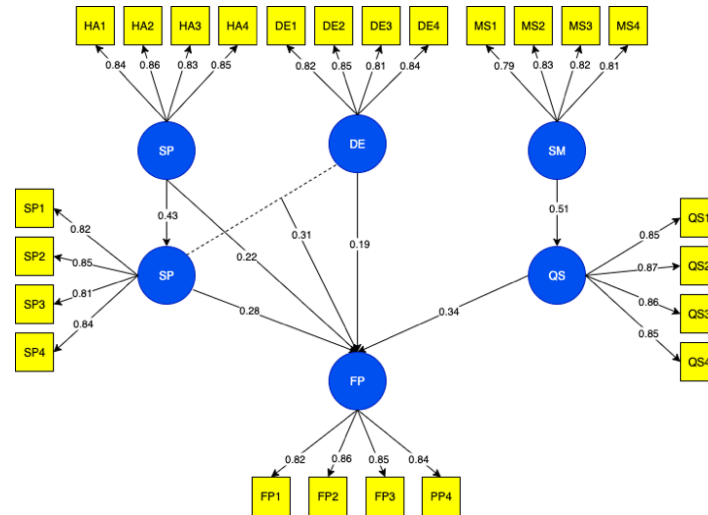
Based on the results of hypothesis testing presented in Table 10, the nine research hypotheses were proven to be significant with a T-statistical value of > 1.96 and $p < 0.01$, where these findings revealed that the quality of service ($\beta = 0.34$; $T = 6,800$) and the interaction of perception of security experience ($\beta = 0.31$; $T = 6,596$) was the strongest predictor of fitness participation, while social motivation provided the strongest indirect influence through improved quality of service ($\beta = 0.51$; $T = 12,439$), and overall this model was able to explain the 57.1% variance in fitness participation ($R^2 = 0.571$).

Theoretically, the results of this study expand the integration of the Health Belief Model (Rosenstock, 1974) and the Technology Acceptance Model (Davis, 1989) in the context of post-pandemic fitness by proving that digital experiences function as a critical moderator that strengthens the influence of safety perception on participation, while affirming the expansion of Planned Behavior Theory (Ajzen, 1991) through the incorporation of digital and post-pandemic variables. These findings support a holistic approach that integrates health, safety, digital, and social aspects in understanding contemporary fitness behaviors (Zhou et al., 2025).

In practical terms, this study recommends: (1) prioritizing improving the quality of services through adequate staff and facility training; (2) investment in digital experiences such as booking apps and virtual training; (3) transparent communication of security protocols to build positive perceptions; (4) the use of social motivation through community and referral programs; and (5) continuous health

education that is integrated with digital services. Policy implications include the development of national hygiene standards for digitally-enabled gyms, collaboration between fitness service providers and health institutions, as well as incentives for gyms that adopt digital health technologies (WHO, 2021). All summaries of Structural Equation Modeling can be seen in (Figure 2).

Figure 2. SEM Model of The Post-COVID-19 Pandemic Fitness Landscape: Determinants of Fitness Participation in Indonesian Commercial Gyms.



Discussion

Based on the in-depth data described above, this analysis will be discussed in depth in the following sections:

RQ1: To what extent does health awareness affect participation in the gym post-pandemic?

Health awareness has proven to be an important determinant in shaping people's fitness behavior post-pandemic. Individuals who have a high health awareness are not only more concerned with disease prevention, but are also more consistent in allocating time for physical activity at the gym. Previous research has shown that the level of health awareness affects exercise intentions and gym loyalty (Pu et al., 2020). The findings of this study also support the argument that health awareness encourages direct and indirect participation through increased perception of safety (Chou & Lee, 2023).

Empirically, the results of structural model analysis showed that health awareness had a significant positive effect on participation ($\beta = 0.22$; $T = 4.314$; $p < 0.01$). In addition, health awareness also has a strong influence on safety perception ($\beta = 0.43$; $T = 8,958$), which indirectly strengthened fitness participation. This confirms that increasing health awareness is a determining factor for sustainable participation, and can be strengthened through health education programs by gym management (Urban et al., 2025).

RQ2: How did the perception of safety influence the decision to return to gym-based fitness?

The perception of safety is an important factor in a person's decision to return to exercise at the gym. Aspects such as facility cleanliness, room ventilation, disinfectant availability, and distancing protocols play an important role in shaping member safety (Falese et al., 2025). The results of this study prove that the higher the perception of safety, the more likely a person is to actively participate in face-to-face fitness activities. This is in line with the research of Ding, del Pozo Cruz, Green, and Bauman (2022), which found that the COVID-19 pandemic became a turning point for people to consider safety factors more before returning to exercise in public spaces.

Based on the results of the structural model, safety perception had a significant influence on fitness participation ($\beta = 0.28$; $T = 5.714$; $p < 0.01$). This effect was further strengthened by the moderation of digital experiences ($\beta = 0.31$; $T = 6,596$), indicating that members who have a positive experience with digital fitness will be more sensitive to safety standards. Therefore, transparent communication regarding health and safety protocols is an important strategy to attract post-pandemic members (Sharma et al., 2024).

RQ3: What impact does the digital fitness experience have on re-engagement in the gym?

The digital fitness experience during the pandemic has had a dual impact on post-pandemic fitness participation. On the one hand, digital platforms such as fitness apps and virtual classes provide convenience and flexibility, thus forming a new standard for face-to-face fitness services (Thompson, 2023). On the other hand, positive experiences with digital fitness encourage individuals to return to the gym with higher expectations of the quality of service. This study shows that digital experiences have a direct effect on fitness participation, as well as strengthening the relationship between safety perceptions and member engagement (Sharma et al., 2024).

Statistically, digital experiences had a significant influence on participation ($\beta = 0.19$; $T = 3.654$; $p < 0.01$). In addition, her role as a moderator strengthened the relationship between safety perception and fitness participation ($\beta = 0.31$; $T = 6.596$). This confirms that while digital fitness offers convenience, many members are still returning to the gym for an irreplaceable social experience, making a hybrid model that blends digital and in-person services a relevant strategy (Liu et al., 2018).

RQ4: How does social motivation shape participation rates in commercial gyms?

Social motivation is one of the most powerful emotional factors in shaping postpandemic fitness participation. The loss of face-to-face interaction during the quarantine period increases people's longing for social experiences which is then manifested in joint activities at the gym (Lau et al., 2022). The study found that social motivation has a significant influence on service quality, which ultimately has a major impact on member participation. This shows that social interaction not only increases satisfaction, but also reinforces members' commitment to consistent training.

The results of the model analysis showed that social motivation had a very strong influence on the quality of services ($\beta = 0.51$; $T = 12.439$; $p < 0.01$). In addition, the quality of this service is the dominant predictor of fitness participation. Thus, social motivation plays an indirect role in increasing participation through better service quality. This supports the argument that gyms need to build internal communities and group-based programs to increase long-term loyalty (Zaccagni et al., 2021).

RQ5: How does the quality of fitness center services affect fitness participation, either directly or indirectly through other variables?

Service quality emerged as the most dominant predictor in explaining post-pandemic fitness participation. Well-maintained facilities, responsive staff, and professional instructors shape member satisfaction, which ultimately drives retention and loyalty (Wisutwattanasak et al., 2023). This study proves that service quality is not only directly influenced by fitness participation, but also indirectly influenced by social motivation. Thus, good service quality serves as a catalyst that reinforces the influence of social factors on member engagement.

The findings of the structural model show that service quality is the most dominant predictor of fitness participation ($\beta = 0.34$; $T = 6,800$; $p < 0.01$). In addition, the combination of social motivation and service quality had a significant influence on participation ($\beta = 0.39$; $T = 7.358$). This reinforces the evidence that quality services not only increase satisfaction, but also maximize the effects of social factors in encouraging participation [12] (García-Fernández et al., 2016).

RQ6: To what extent do these five variables simultaneously predict fitness participation in the post-pandemic fitness landscape?

Structural model analysis showed that five variables of health awareness, safety perception, digital experience, social motivation, and quality of service were simultaneously able to explain 57.1% of the fitness participation variance. This figure shows substantial predictions, with service quality and interaction perceptions of digital experience security as the most dominant predictors ($\beta = 0.34$; $\beta =$

0.31). These findings suggest that post-pandemic fitness participation is not the result of a single factor, but rather a complex combination of psychological, social, digital, and environmental factors (Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, 2014).

In addition, these results support the integration of several behavioral theories, such as the Health Belief Model (e.g., recent research shows the integration of HBM and TPB is effective in predicting post-pandemic health prevention behaviors), Planned Behavior Theory (TPB-based interventions have been shown to significantly improve obesity prevention behaviors through virtual platforms), and Technology Acceptance Model (recent research confirms that TAM, which is extended by the trust factor and social influence, are strong predictors of digital fitness app use (Beldad & Hegner, 2018; Drehlich et al., 2020; Liu et al., 2018; Moghimi et al., 2023). This suggests that contemporary fitness behaviors require a holistic approach that combines health awareness, digital technology acceptance, and the need for social interaction (Zhou et al., 2025). Thus, gym development strategies in the post-pandemic era must include a multidisciplinary dimension to achieve sustainable participation.

Conclusions

Post-pandemic fitness participation in Indonesian commercial gyms is influenced by complex interactions between health, safety, digital, social, and service factors. Service quality emerges as the most dominant predictor, followed by the moderating role of digital experience on perceptions of safety. Social motivation indirectly increases participation through its strong effect on service quality. The integrated model shows substantial predictive power, explaining 57.1% of the variance in participation. These findings underscore the importance of multi-dimensional strategies that include improving facility hygiene, utilising digital tools, fostering social communities, and maintaining high service standards to drive gym attendance. For policymakers and gym operators, these insights offer an evidence-based pathway to revitalize the fitness industry in the new normal. Future research should explore longitudinal dynamics and cross-regional cultural variations.

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