The use of fitness centre apps and its relation to customer satisfaction: a UTAUT2 perspective

Helena Ferreira Barbosa

Arts, Humanities and Sports Department, Polytechnic Institute of Beja, Beja, Portugal

Jerónimo García-Fernández

Physical Education and Sport Department, University of Seville, Seville, Spain

Vera Pedragosa

Economics and Business Science Department, Psychology Research Centre, Autónomous University of Lisbon, Lisbon, Portugal, and

Gabriel Cepeda-Carrion

Management and Marketing Department, University of Seville, Seville, Spain

Abstract

Purpose – The purpose of this paper is to analyse the intention of using fitness app made available by the fitness centre to its members and their relationship with overall customer satisfaction.

Design/methodology/approach – The present study uses the extended unified theory of acceptance and use of technology (UTAUT2) as the base model. All the hypothesised relationships were tested through partial least square structural equation modelling (PLS-SEM), in a quantitative study with data from 1,676 fitness consumers from Portugal.

Findings – The results support the ability of UTAUT2 in predicting the customer's intention to use the fitness app. Performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation and habit have a positive impact on behavioural intentions to use the fitness app. Performance expectancy and habit have the strongest relationships. Behavioural intentions are positively related both to the usage behaviour of the fitness app and to overall customer satisfaction.

Practical implications – The results of this study present a strong contribution for fitness centre managers, since it highlights the importance of using these apps as a way to increase customer satisfaction, increasing retention levels.

Originality/value – This study is paramount as regards to examine the behavioural intention to use the fitness apps that the fitness centres make available to their members using UTAUT2 model.

Keywords Technology adoption, UTAUT2, Fitness app, Behavioural intentions, Overall customer satisfaction

Paper type Research paper

1. Introduction

Digital transformation is an increasingly present reality in the fitness sector (Jones *et al.*, 2020). Gradually, fitness centres' managers have incorporated new technologies into the organisation and management of their business, not only with a view to assist in this aspect of organisation and management but also to offer the consumer a more satisfying experience (Andre, 2020). According to García-Fernández *et al.* (2020a), this transformation creates a direct impact in all areas of the fitness centres.

The digital expansion, at the level of smartphones and wearable devices, has given rise to the fitness app as one of the main categories of apps in the current market for mobile apps (Hu and He, 2020). Mobile fitness apps flood the mobile app market (Beldad and Hegner, 2017).

During the first quarter of 2020, health and fitness apps were downloaded 593 million times, and by the end of the second quarter of 2020, 656 million downloads are expected. The download of these apps increased over the same period last year, probably due to the COVID-19 pandemic that led consumers to stay at home and restructure their exercise regimen and general lifestyle practices (Clement, 2020). Yet, mobile exercise apps are proving to be a growing trend in the fitness world, reaching 12th on the fitness trend chart for 2021 (Thompson, 2021).

The features of individual-oriented fitness apps can significantly improve both exercise adherence and social involvement of users (Hu and He, 2020). In their study, Molina and Myrick (2020) concluded that fitness apps that enable social interaction and/or social comparison are more appropriate for individuals who begin to use the app due to social influences. Individuals who begin with a goal to improve their physical fitness or appearance may want more self-focused features in a fitness app in order to persist in its use.

In particular, the fitness apps used by fitness centre are generally integrated into the management/customer relationship management (CRM software) they use (King, 2018). These fitness apps prove to be a convenient and easily accessible tool that allows fitness centre to remain constantly connected to their members. These fitness apps can help to improve members' experience and can also increase revenue and referrals by reducing operating costs. Among other advantages of using this type of fitness app is, for example, the member's mobile check-in with the QR code function, which facilitates and minimises the number of member cards to be printed or purchased and frees up team time from reception. By automating other processes, such as purchasing spa services or scheduling personal training sessions, apps reduce labour and administrative costs. Another advantage of using this type of app is the reduction of costs in acquiring new customers. Also push notifications and communications through the fitness app cost less than sending messages and can significantly reduce the cost of printing marketing materials. By using these fitness apps, the fitness centre can interact more and better with the customer, developing a closer relationship with the brand and centre's team. By using fitness centre app, members tend to remain committed for a longer period of time, increasing fitness centre retention.

However, the question is: what are the factors that affect intention to use fitness app? To respond this question, a variety of theoretical models that explore consumer intentions and the actual use of new technologies (technology acceptance model, TAM; unified theory of acceptance and use of technology, UTAUT; and extended unified theory of acceptance and use of technology, UTAUT2) were analysed. The UTAUT2 model was chosen for this study, since this theory is directed to the customer's perspective, which is what is intended to be studied. Additionally, this theory also integrates three more constructs than the previous models, hedonic motivation; price value; and habit (Venkatesh *et al.*, 2012), integrated precisely to examine consumer acceptance and use of technology (Beh *et al.*, 2019). Even so, the price value has been removed from this study since the fitness apps are made available to members by fitness centres without any extra value. Although other studies make use of this model with respect to fitness apps, no other applies it to the apps of the fitness centres. Thus, its intended to analyse whether UTAUT2 serves to predict the customer's intention to use the fitness app. The model was tested using partial least squares (PLS), in a quantitative study with data from a large sample of Portugal.

This study contributes to sport marketing literature since the UTAUT2 model was adopted aimed the perspective of the customers of the fitness centres. In addition, this study contributes to the literature since the model was used by adding another measure, namely overall customer satisfaction. It is considered important to analyse the relationship between behavioural intention to use the app in the overall customer satisfaction, since this variable is of great concern to the sector of fitness centres and the managers and since it is associated with customer retention and loyalty (Bodet, 2006; Rust *et al.*, 1995).

According to the above, the objective of the study is to analyse the intention of using fitness app made available by the fitness centre and their relationship with overall customer satisfaction.

The remainder of the paper is organised as follows. Section 2 reviews the related literature of the theoretical models used to understand the adoption of technologies, TAM, UTAUT and UTAUT2 as well as to describe the variables of the study. In section 3, the research hypothesis and research method will be presented. Methodology will be detailed in section 4. Discussions will be presented in section 5. Section 6 will discuss and conclude the paper as well as presenting the theoretical and practical implications of this study. Section 7 will present limitations of the study and future research.

2. Literature review
2.1 Technological innovation
Technological phenomena such as the Internet, mobile technologies and big data are causing changes in business and society (Brem and Voigt, 2009). The Internet has changed the industry, and digital has assumed importance in all economic activities. This change has brought new and emerging consumer segments, cultural diversity in a global market, increased consumer expectations regarding the quality of products and services and the impact of the Internet on the company's core business (Akerman et al., 2015).

Innovation in sports through technological advances is a growing interest worldwide, and many sport organisations are seeking competitive advantage through innovation. The growth of the use of technologies in the sports sector has allowed to facilitate and improve the adherence to the sports practice and should be understood as a mean that influences this same practice (Valcarce and Díez, 2018). There are already studies that indicate that the adherence is higher in individuals who use mobile applications (Du et al., 2016; Voth et al., 2016). Ferreira Barbosa et al. (2020) found that the use of technologies influences consumer retention in fitness centres. Given the importance of retention for this sector, these companies should invest heavily on the use of technologies.

2.2 Theoretical models used to understand the adoption of technologies
A variety of theoretical models have been established to explore consumer intentions and the actual use of new technologies (Beh et al., 2019). The following are the models for the adoption and use of technology that served as the basis for the elaboration of the model in this study: TAM (Davis et al., 1989) the UTAUT (Venkatesh et al., 2003) and the UTAUT2 (Venkatesh et al., 2012). From the consumer perspective, these last models, UTAUT and UTAUT2, have greater predictive power compared to TAM (Venkatesh et al., 2012).

TAM has been usually used in estimating the probability that consumers will accept or reject an innovative technology. This model argues that when users are introduced to a new technology, several factors influence their decision on how and when to use it, namely: perceived usefulness and perceived ease of use (Davis et al., 1989). Perceived usefulness is considered to be the potential user's subjective probability that the use of a specific application system will increase his/her professional performance within an organisational context and perceived ease of use refers to the degree to which the potential user expects the target system to be effortless (Davis et al., 1989). Though, the TAM alone appears not to be enough to posit determinants of the adoption of new technologies because the model leaves out crucial determinants, like social impact in real situations (Beh et al., 2019). Therefore, many researchers have tried to integrate other theories into the TAM to better explain individuals' acceptance towards new technology. This model has been analysed in the sports sector and specifically in the fitness apps in other studies (Beldad and Hegner, 2017; García-Fernández et al., 2020b).

UTAUT model was proposed as a new IT acceptance theory (Venkatesh et al., 2003). This model is widely used to examine the acceptance and use of technologies by individuals (Gao et al., 2015). There are four independent variables placed in the UTAUT model that directly determine

behavioural intentions, namely: performance expectancy, effort expectancy, social influence and facilitating conditions. Performance expectancy, indicates the degree to which an individual believes that using the system will help him or her to gain performance at work; effort expectancy is the degree of ease associated with using the system; social influence refers to the degree to which an individual realises that his or her social referents believe they should use the new system; facilitating conditions is the degree to which an individual believes there is an organisational and technical infrastructure to support the use of the system (Venkatesh et al., 2003). The use of technology is explained directly by the intention of use and the facilitating conditions. In turn, the intention of utilisation is directly determined by the performance expectancy, effort expectation and social influence. Individual differences (namely, age, gender and experience) are moderating variables of the relationships between the four nuclear variables, behavioural intention and the use of technology (Venkatesh et al., 2012). The UTAUT's constructs have been positively associated with the intention to adopt a fitness app (Liu et al., 2019; Vinnikova et al., 2020). In this model, academics criticised that it only considered relevant factors in predicting the behavioural intention of employees to use new technologies in organisational contexts. Therefore, Venkatesh et al. (2012) extended the UTAUT model to the UTAUT2 model regarding customers' perspectives.

In UTAUT2 model (Figure 1), together with the four original constructions of UTAUT, there are three additional constructions, namely: hedonic motivation; price value; and habit (Venkatesh et al., 2012). Integrated to examine consumer acceptance and use of technology (Beh et al., 2019). Hedonic motivation is added to the UTAUT2 model to highlight the intrinsic motivations of users in the acceptance of consumer products. It refers to the fun or satisfaction derived from the use of technologies (Venkatesh et al., 2012). The price value is integrated in the UTAUT2 model because, unlike the organisational context, it is the users who bear its costs and may influence the behavioural intention of consumers (Venkatesh et al., 2012). The habit refers to the degree to which the individual tends to use technology automatically as a result of a learning process (Venkatesh et al., 2012). Extensive research has applied UTAUT2 to analyse the use of app in different contexts (e.g. bank apps, shopping apps, restaurants apps, etc.) (Alalwan, 2020; Chopdar et al., 2018; Palau-Saumell et al., 2019). Some studies have also applied this model with respect to the fitness apps and fitness wearable technologies (Beh et al., 2019; Hew et al., 2015; Neeraj et al., 2019; Shamim et al., 2019; Yuan et al., 2015). Since the study is directed to the client's perspective, this was the model selected to these studies.

In relation to behavioural intention, it refers to how much people are willing to try and how much they are planning to use determinations to perform a behaviour. An intention is not the same as a behaviour. However, it can be understood as a measure of how much a person is willing to engage in a particular behaviour (Ajzen, 2001). According to Fishbein and Ajzen (1975), behavioural intention refers to a person's subjective probability that they will perform some behaviour. Positive interactions of the consumer with the organisation are positively related to favourable behavioural intentions, such as recommending the service to others, paying a price premium to the company and expressing cognitive loyalty to the organisation (Zeithaml et al., 1996).

As the behavioural intentions of customers will be studied, it is considered appropriate to observe the overall customer satisfaction. The relationship of the intention to use the application can be a determinant of the global satisfaction of the customer, a subject that is a great concern to sport marketing academics, also proving to be of extreme importance for the managers of fitness centres.

2.3 Overall customer satisfaction
Overall satisfaction is the total level of satisfaction felt by the client and that comes from services capability to provoke desire, needs and expectations (Ferrand et al., 2010). The members are satisfied when understand, meet or exceed their needs (Gerson, 1999).
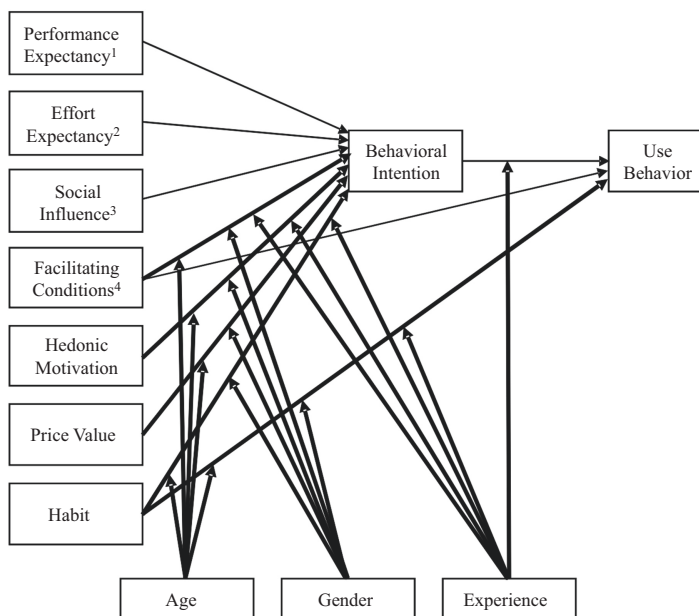
Note(s): 1. Moderated by age and gender
2. Moderated by age, gender, and experience
3. Moderated by age, gender, and experience
4. Effect on use behavior is moderated by age and experience
5. New relationships are shown as darker lines

Overall satisfaction has a greater ability to predict economic performance, as managers make their purchasing decisions according to all experiences and not just an exchange or a particular episode (Pedragosa *et al.*, 2015). It is extremely important that managers focus on the factors that contribute most to customer satisfaction, which is once considered an essential variable for customer retention (Bodet, 2006; Rust *et al.*, 1995). Other investigations also associate consumer satisfaction as one of the most important concepts in marketing thinking and practice, as satisfaction has been significantly associated with purchase, repurchase, attitude and brand loyalty (Carlson and O'Cass, 2010; Lee and Kang, 2015; Yoshida and James, 2010).

3. Model development
3.1 Performance expectancy and behavioural intention
Performance expectancy has consistently been shown to be the strongest predictor of behavioural intention (Venkatesh *et al.*, 2003). Research indicates that consumers are more likely to adopt a particular technology which they perceive to be more useful in their everyday life (Alalwan, 2016; Alalwan *et al.*, 2017). Regarding mobile app, Lee *et al.* (2012), confirmed that consumers' intentions to use mobile app increase if the perceived utility of the app is bigger. Consequently, if the consumer finds that mobile apps are useful, then they would have higher intention to use them. Therefore, this study hypothesises that:

H1. Performance expectancy has a positive impact on the behavioural intention of using the fitness app.

3.2 Effort expectancy and behavioural intention

Such as performance expectancy, effort expectancy is another strong predictor for analysing behavioural intention and actual technology usage (Venkatesh *et al.*, 2003, 2012). Consumers' intentions to adopt a new technology is not just influenced by the perceived value and its utility, but also by the efforts required to use the technology (Davis, 1989). Technology that is easy to use in an initial phase positively influences consumer's intentions towards using it (Neeraj *et al.*, 2019). On the other hand, the more effort users need to dedicate to an app, the less likely they will continue to use it over time (Yuan *et al.*, 2015). Therefore, it is possible to assume that high effort expectancy would be associated with more positive intention to use the mobile app.

H2. Effort expectancy has a positive impact on the behavioural intention to use the fitness app.

3.3 Social influence and behavioural intention

Social influence significantly influences an individual's behavioural intention. Mobile app makes it convenient for users to connect with people they think are important to them, which reinforces their social influence in this context (Yuan *et al.*, 2015). The role of social influence is crucial, particularly for products or services in the early stages of development, where technological products are entirely new to them and they lack information about the use of this new technology (Adapa *et al.*, 2018). Mobile apps are not only useable by certain groups of users and, based on which oneś will, its use is mandatory. Based on that, there is a chance that users of mobile apps are forming the behavioural intention based on the social influence (Hew *et al.*, 2015). Therefore, this study forms the following hypothesis:

H3. Social influence has a positive impact on the behavioural intention to use the fitness app.

3.4 Facilitating conditions and behavioural intention

Facilitating conditions are explained as factors in the environment that either facilitate or impede acceptance of technology (Venkatesh *et al.*, 2012; Yuan *et al.*, 2015). Consumers are therefore encouraged to use technologies for which they have some support and resources and consider that the specific technology is compatible with the technologies they have previously used (Alalwan *et al.*, 2017). Knowing how to use mobile app can also influence the users' continued use. Users with better knowledge of how to use apps are more likely to continue to use them (Yuan *et al.*, 2015). Therefore, it is suggested that facilitating conditions positively affect individuals' intention to use the mobile app.

H4. Facilitating conditions have a positive impact on the fitness appś behavioural intention to use.

3.5 Hedonic motivation and behavioural intention

Venkatesh and Davis (2000) have showed that hedonic motivation is an important factor in technology acceptance. Users are more inclined to use technologies that appear to be entertaining with unique, creative tools and functions (Alalwan *et al.*, 2017). Previous studies in different settings clearly establish a positive relationship between hedonic motivation and behavioural intention (Beh *et al.*, 2019; Farooq *et al.*, 2017; Gu *et al.*, 2016; Neeraj *et al.*, 2019; Yuan *et al.*, 2015). In relation to health and fitness apps, though they are not designed directly for hedonic motivations, many also include entertaining features in order to keep users involved and engaged (Yuan *et al.*, 2015). Based on the above argument, the study hypothesises that:

H5. Hedonic motivation has a positive impact on the behavioural intention to use the fitness app.

3.6 Habit and behavioural intention
It is conceptualised as a self-reported perception of automatic involvement in a given behaviour, which has been found to be a significant predictor of mobile Internet use. Venkatesh *et al.* (2012) found that habit affects the behavioural intention to use technology. In addition, existing research has empirically validated the habit as one of the strongest predictors of usage in several fields (Hew *et al.*, 2015; Miladinovic and Hong, 2016; Oliveira *et al.*, 2016). Therefore, we hypothesise that:

H6. Usage habit has a positive impact on the behavioural intention to use fitness app.

3.7 Behavioural intention and use behaviour
Investigations have consistently demonstrated that behavioural intention is the strongest indicator of use behaviour (Davis, 1989). If there is a higher probability of using a certain technology, individuals who develop intentions about a certain behaviour are more likely to practice this behaviour (Orbell *et al.*, 1997). Thus, based on the discussion above, it is assumed that there is a positive relationship between behavioural intention and the use of technology.

H7. Behavioural intention has a positive impact on the use behaviour of the fitness app.

3.8 Behavioural intention and customer overall satisfaction
Previous research (Howat *et al.*, 1999; McDougall and Levesque, 2000; Murray and Howat, 2002) has noted that consumers' behavioural intentions have been positively correlated with other factors such as consumer satisfaction. This is the link that is looked for, the behavioural intention with the fitness app to the overall customer satisfaction with the fitness centre. Thus, it was sought to study the impact of behavioural intention to use the fitness centre's app with customer overall satisfaction.

H8. Behavioural intention to use the fitness app has a positive impact on customer overall satisfaction with the fitness centre.

Figure 2 shows the model of this research, resulting from the combination of the above hypotheses.

4. Methodology
This cross-sectional study used a quantitative research approach to analyse the intention to use the mobile apps made available by fitness centres and their relationship with overall customer satisfaction.

4.1 Data collection
To obtain our data set, *Associação de Ginásios e Academias de Portugal* (AGAP) was contacted in order to request its collaboration in the dissemination of the survey. Thus, in July 2020 AGAP contacted the fitness centres to present the basis and objectives of the study, sent our survey and requested this survey to be forwarded to the members. The questionnaire was applied from July to September 2020.

The sample is composed by 1,676 fitness centres customers from Portugal. This country has a good context for the study once there is a great development of fitness centres apps and,
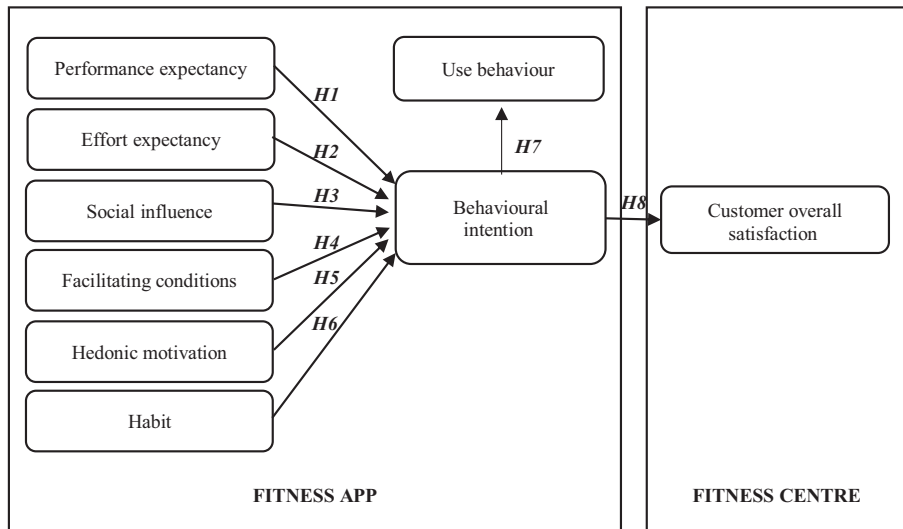
according to the 2021 Fitness Barometer, about 68% of fitness centres use these apps (Pedragosa and Cardadeiro, 2021).

The female members (59%, $n = 982$) were superior to the male members (41%; $n = 696$), which coincides with the percentages of men and women in Portugal (Pedragosa and Cardadeiro, 2021). The age group that answered most to the questionnaire was the 25–34 years old (29%; $n = 491$) and 35–44 years old (29%; $n = 486$). Regarding academic qualifications it was found that 66% ($n = 1,101$) of the members had a higher education. The districts in the country from where most replies were received were Lisbon (54%; $n = 903$), Porto (14%; $n = 236$), Setúbal (9%; $n = 145$) and Beja (7%; $n = 122$). The distribution of questionnaire responses by district coincides with the distribution of the population of Portugal. About 34% ($n = 576$) of respondents reported attending the fitness centre on average more than five times a week. It was also found that 32% have been registered in the fitness centre for more than four years and another 32% reported being registered between two and three years. Most members (84%; $n = 1,403$) reported using the fitness app, which were those included in the final sample.

4.2 Measurement instrument

The questionnaire items, based on the existing literature related to the UTAUT2 model, were adapted to the particular context of this study. The questionnaire, included in Appendix, has 33 items. Four associated to the performance expectancy variable (i.e. I find the mobile application of my gym useful), four associated to the effort expectancy (i.e. learning to use my gym's mobile application is easy), five associated to the social influence (i.e. people who are important to me think I should use the gym's mobile application), four associated to the facilitating conditions (i.e. I have the necessary resources to use the gym's mobile application), three to the hedonic motivation (i.e. using the gym mobile application is fun), four to the habit variable (i.e. the use of the mobile gym application has become a habit for me), four items associated to the behavioural intention (i.e. I intend to continue using the gym mobile application in the future) and one associated to the use (I frequently use the application). As mentioned, the variable price value was excluded since the fitness app to be studied are made

available to members without any extra value. Four items were also added to the questionnaire to measure overall customer satisfaction based on García-Fernández *et al.* (2018a). All items are measured on a Likert scale of five points where 1 expresses maximum disagreement and 5 expresses total agreement. The questionnaire also includes questions of a socio-demographic nature and characterisation of the member such as age, gender, academic qualifications, average weekly frequency of use of the fitness centre, time of registration and also questions related to the use of the fitness app, such as if the client uses the fitness app and which one is used by the fitness centre that the member attends. These variables were used as instrumental variables and control variables to test issues about common method bias (CMB) and endogeneity.

4.3 Data analysis

The software used for data analysis was SmartPLS 3.3.2 (Ringle *et al.*, 2015). This software is specialised in the models that follow the PLS-SEM approach (partial least squares structural equation modelling). The PLS-SEM estimation method is a versatile method to estimate models of structural equations (Sarstedt *et al.*, 2017). Structural equation modelling (SEM) is one of the most powerful and advanced methodologies for data analysis techniques that simultaneously study the behaviour of multiple variables (Hair *et al.*, 2012).

The relationships between the constructs and the indicators were analysed using a composite process (Richter *et al.*, 2015). According to Hair *et al.* (2017) and Henseler (2017) in the composite process, PLS-SEM is one of the most proper tools to use. In this study, the independent variables were estimated in Mode A, as well as final dependent variables, behavioural intention, use behaviour and overall customer satisfaction.

Following to Cepeda-Carrión *et al.* (2019) our study was an explanatory analysis, which was divided into two stages. The first stage was to assess the measurement (outer) model, identifying the relationships between observable variables and the theoretical concepts. The measures of internal consistency reliability used were rhoA (Henseler *et al.*, 2016), Cronbach's alpha measures and composite reliability. The AVE (average variance extracted) measure served of unidimensionality and convergent validity and a heterotrait–monotrait (HTMT) ratio of correlations as well as Fornell and Larcker's criteria were used to provide evidence of discriminant validity (Henseler *et al.*, 2015).

The second step was to evaluate the structural (inner) model to test if the proposed causal relationships were consistent with the available data. R^2 and path coefficients are the most important result of the structural model (García-Fernández *et al.*, 2018b). The bootstrap percentile CIs was used to check the significance of the path coefficients (García-Fernández *et al.*, 2018b).

4.4 Single respondent bias, common method bias and endogeneity of the model

The sample size, the fact that the questionnaire is anonymous, the simplistic nature of the questions, minimises the risk of respondent biases. CMB may affect findings and it refers to the difference between the trait score and measured score that is attributed to the use of a common method to take more than one measurement of the same or different traits (Podsakoff *et al.*, 2003). Kock (2015) demonstrate that the full collinearity test based on variance inflation factors is successful in the identification of CMB, therefore, the present model may be considered free of CMB, once the VIF values are all above than 3.3.

In the case of using PLS-SEM for confirmatory/explanatory purposes (the case of our model) controlling for endogeneity is crucial in order to adequately test hypotheses (Papies *et al.*, 2017). Ebbes *et al.* (2016) establish that including suitable control variables handles the impact of endogeneity on the model estimates. Therefore, since on this study control variables are used, apparently our model has no endogeneity problems.

5. Results

As explained before, the analysis and interpretation of the results was made in two phases.

5.1 Measurement model

For Mode A composites, our results confirm that individual items are consistent, since all standardised weight correlations are superior to 0.7, except fc4 (0.649). Given this, as all the other indicators show values above 0.7 and since the convergent and discriminant validity and reliability are well, we have decided to maintain this indicator. As shown in Table 1, all the constructs have, Rho, composite reliability and Cronbach's alpha above than 0.7 in all cases, which suggests that the model satisfies the prerequisite of construct reliability. Furthermore, the scores for the AVE exceed the threshold of 0.5, which means that the latent variables explain more than half of the variance of its indicators. Also, all the variables achieve discriminant validity, once the HTMT value is below 0.9.

Additionally, discriminant validity of the constructs was also evaluated using Fornell–Larcker criteria. As it can be verified in Table 2, the diagonal values are superior to the off-diagonal values, all the loadings are greater than the correspondent cross-loadings. Consequently, both criteria provide evidence of discriminant validity.

5.2 Structural model

The structural model was assessed by examining the R^2 values and the sign, size and significance of the path coefficients of the structural relationships. 10,000 samples were used in bootstrapping (Streukens and Leroi-Werelds, 2016). According to Hayes and Scharkow (2013) the bootstrap CI is an effective way to detect significance in path coefficients. All the path coefficients support our hypotheses as shown in Table 3 and Figure 3.

With the values of R^2 it was possible to verify that the model achieves the explanatory power. The proposed model explains 75.2% of the variance in behavioural intentions, 29.5% of the variance in overall customer satisfaction, and 57% in use behaviour. Therefore, behavioural intention achieves superior explanation of variance than overall customer satisfaction and use behaviour but also, use behaviour achieves better explanation of

Construct	rho_A	Composite reliability	Cronbach's alpha	AVE	HTMT (BI)	HTMT (OS)	HTMT (UB)
Behavioural intention	0.896	0.924	0.890	0.753	–	–	–
Performance expectancy	0.904	0.932	0.903	0.775	0.837	–	–
Effort expectancy	0.949	0.962	0.947	0.864	0.566	–	–
Social influence	0.904	0.928	0.902	0.722	0.718	–	–
Facilitating conditions	0.775	0.857	0.775	0.602	0.583	–	–
Hedonic motivation	0.929	0.952	0.924	0.868	0.749	–	–
Habit	0.863	0.888	0.831	0.667	0.9	–	–
Overall satisfaction	0.931	0.950	0.930	0.827	0.583	–	–
Use behaviour	1.000	1.000	1.000	1.000	0.777	0.446	–
Age	1.000	–	–	–	0.027	0.078	0.011
Gender	1.000	1.000	1.000	1.000	0.138	0.070	0.126
Academic qualifications	1.000	1.000	1.000	1.000	0.061	0.072	0.041
Average weekly frequency of use of the fitness centre	1.000	1.000	1.000	1.000	0.019	0.045	0.145
Time of registration	1.000	1.000	1.000	1.000	0.038	0.102	0.022

Table 1.
Reliability, convergent validity and discriminant validity values of outer model

	BI	PE	EE	SI	FC	HM	H	OS	US	A	G	AQ	AWF	TR
BI	0.87													
PE	0.75	0.88												
EE	0.52	0.51	0.93											
SI	0.64	0.62	0.40	0.85										
FC	0.49	0.46	0.62	0.42	0.78									
HM	0.68	0.68	0.47	0.71	0.45	0.93								
H	0.80	0.64	0.47	0.60	0.45	0.64	0.82							
OS	0.53	0.54	0.41	0.54	0.46	0.56	0.46	0.91						
US	0.74	0.57	0.46	0.47	0.45	0.48	0.74	0.43	1.00					

Note(s): BI = Behavioural intention; PE = Performance expectancy; EE = Effort expectancy; SI = Social influence; FC = Facilitating conditions; HM = Hedonic motivation; H = Habit; OS = Overall customer satisfaction; US = Use behaviour

Table 2.
Fornell–Larcker criterion

Hypotheses	Path coefficient	P values	CIs 5.0%	CIs 95.0%	Supported	f^2
H1: Performance expectancy → Behavioural intention	0.308	0.000	0.259	0.356	Yes	0.163
H2: Effort expectancy → Behavioural intention	0.057	0.000	0.020	0.095	Yes	0.007
H3: Social influence → Behavioural intention	0.075	0.000	0.040	0.110	Yes	0.010
H4: Facilitating conditions → Behavioural intention	0.034	0.006	0.001	0.070	Yes	0.003
H5: Hedonic motivation → Behavioural intention	0.071	0.000	0.030	0.111	Yes	0.007
H6: Habit → Behavioural intention	0.473	0.051	0.436	0.509	Yes	0.434
H7: Behavioural intention → Use behaviour	0.734	0.002	0.705	0.762	Yes	1.224
H8: Behavioural intention → Overall satisfaction	0.530	0.000	0.491	0.568	Yes	0.388
Age → Overall satisfaction	−0.070	0.002	−0.110	−0.031	NA	0.006
Age → Use behaviour	−0.029	0.054	−0.058	0.001	NA	0.002
Gender → Overall satisfaction	−0.004	0.434	−0.042	0.035	NA	0.000
Gender → Use behaviour	0.045	0.008	0.015	0.076	NA	0.004
Academic qualifications → Overall satisfaction	−0.030	0.097	−0.069	0.008	NA	0.001
Academic qualifications → Use behaviour	0.067	0.000	0.039	0.095	NA	0.010
Average weekly frequency of use → Overall satisfaction	0.015	0.271	−0.025	0.055	NA	0.000
Average weekly frequency of use → Use behaviour	0.141	0.000	0.110	0.171	NA	0.044
Time of registration → Overall satisfaction	−0.065	0.004	−0.105	−0.023	NA	0.005
Time of registration → Use behaviour	0.031	0.044	0.001	0.061	NA	0.002

Table 3.
Construct effects on endogenous variables (including lower and upper bounds of 95% CI)

variance than overall customer satisfaction. The effect size (f^2) measures the degree to which an exogenous construct helps to explain a given endogenous construct in terms of R^2, were shown in last column in Table 3.

P values below 0.05 of the control variables on the dependent variables indicate their influence on them. Thus, we verify that the age and time of registration influences on overall
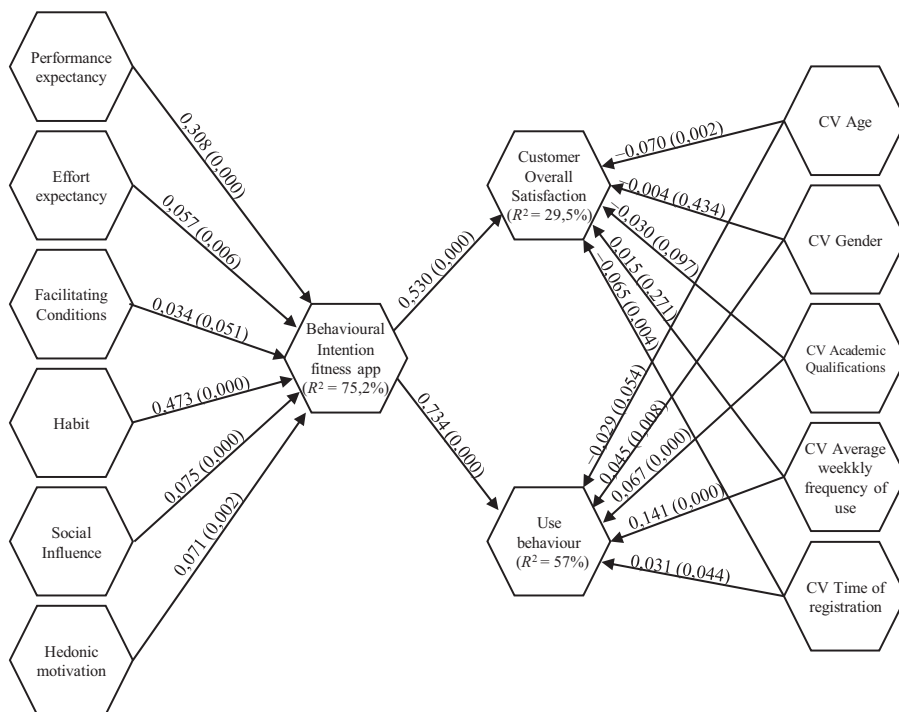
Figure 3.
Structural model
results

customer satisfaction, as well as gender, academic qualifications and average weekly
frequency of use influences on use behaviour. According to the results, all the hypotheses
stated were supported and controlled by age, gender, time of registration and academic
qualifications.

Through the decomposition of the variance, of the total variance of behavioural intentions,
it was verified that 38% of the variance of behavioural intentions is explained by habit, 23%
by performance expectancy, 5% by social influence and hedonic motivation, 3% is explained
by effort expectancy and only 2% of the variance of behavioural intentions is explained by
facilitating conditions.

6. Discussion and conclusions

Our findings support the ability of UTAUT2 in predicting the customer's intention to use the
fitness app. Namely, findings confirm that the intention to use the fitness app is predicted by
performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic
motivation and habit, confirming hypotheses H1, H2, H3, H4, H5 and H6. All hypotheses were
confirmed based on the path coefficient analysis. When the sign of the path coefficient is the
same as that postulated in the hypothesis, this means that the hypothesis is supported.
Furthermore, we know that higher absolute values denote higher (predictive) relationships
between variables (Hair *et al.*, 2019). Thus, it was found that performance expectancy and
habit have the strongest relationships with behavioural intentions. The results also suggest
that behavioural intentions are positively related both to the usage behaviour of the mobile
app and to overall customer satisfaction with the fitness centre, confirming H7 and H8
hypotheses. All the stated hypothesis have been, this way, confirmed.

Our findings reveal that performance expectancy has a positive impact on customer's behavioural intentions to use the fitness app, keeping consistency with previous research related to fitness wearable technologies and fitness apps (Hew *et al.*, 2015; Yuan *et al.*, 2015; Shamim *et al.*, 2019; Beh *et al.*, 2019). The results also revealed that effort expectancy has a positive impact on behavioural intentions to use the fitness apps. This means that consumers' intentions to use fitness app are more if the technology is easy to understand. These findings are consistent with previous research findings in context of fitness wearable technologies and fitness apps (Hew *et al.*, 2015; Shamim *et al.*, 2019; Beh *et al.*, 2019; Neeraj *et al.*, 2019). Similarly, the results revealed that social influence has a positive impact on the consumers' behavioural intentions to use this app. In line with the previous research findings (Shamim *et al.*, 2019; Neeraj *et al.*, 2019). This indicates the influence of family, friends, even the members of the fitness centre staff on the behaviour of users and their intentions to use the app. Results also showed that facilitating conditions has a positive impact on the consumers' behavioural intentions. These results are supported and validated in other studies (Hew *et al.*, 2015; Beh *et al.*, 2019). The findings suggest that hedonic motivation has also a positive impact on behavioural intentions to use this apps. This finding supports the results of existing studies conducted in the context of fitness wearable technologies and fitness apps adoption (Hew *et al.*, 2015; Beh *et al.*, 2019). Regards to habit, the results indicate that habit has a positive impact on behavioural intentions. These results are consistent with the existing studies related to fitness wearable technologies and fitness apps (Hew *et al.*, 2015; Neeraj *et al.*, 2019; Shamim *et al.*, 2019; Yuan *et al.*, 2015). These results suggest that fitness centres should choose fitness apps in which the client connects emotionally.

Conversely, these results contradict those of Yuan *et al.* (2015) about effort expectancy, social influence and facilitating conditions, once they verified that these variables were not found to predict users' intention of continued usage of fitness apps. Our findings also contradict those of Neeraj *et al.* (2019) about performance expectancy, facilitating conditions and hedonic motivation, since they find that these variables did not influence behavioural intention to adopt fitness apps.

Likewise, the results indicate that the control variables have influence on use behaviour and overall customer satisfaction. Through the analysis, it is possible to conclude that the most relevant characteristics regarding the app are that it is clear, understandable to use and fun. The analysis also highlights the indicator that most affects overall customer satisfaction: happiness regarding the fitness centre's programs and services. In particular, the intention to make positive comments about the app was also found to be the indicator that most affects behavioural intentions. Finally, 84% of members use the app of their fitness centre and of these, 66% use it frequently. This behaviour is important as the behavioural intention to use it has a positive relationship with overall customer satisfaction with the fitness centre.

6.1 Theoretical and practical implications
The results of this study contributed to the sports marketing literature by reviewing the UTAUT2 model and adding another measure, namely overall customer satisfaction. Up to the present, there are no studies addressing this issue. Many studies analyse the intention of using fitness apps (Beldad and Hegner, 2017; Neeraj *et al.*, 2019; Yuan *et al.*, 2015) but none refer to the apps used by fitness centres. Thus, this is a theoretical contribution of this study.

Since this study shows that the vast majority of members use the fitness centre's fitness application, managers should invest in its use to reduce labour and administrative costs. For example, by automating processes such as entering in the fitness centre, scheduling classes, scheduling spa services and personal training sessions, it is possible to reduce the number of reception staff or redirect them to other tasks. Also, push notifications and communications through the application cost less than sending messages when needed. The use of the app can

also significantly reduce the cost of printing marketing materials such as invitations for potential members or class schedules.

Similarly, a problem that fitness centre managers face on a daily basis is the retention of their members. Therefore, for this sector, it is extremely important to understand the variables that affect loyalty (Ferreira Barbosa *et al.*, 2020). Thus, the results of this study present a strong contribution for fitness centre managers, since it highlights the intention to use this app, the most valued aspects in its use and the relationship with overall customer satisfaction, leading, then, to increased loyalty.

7. Limitations and future research

This study has some limitations. The first limitation found relates to the fact that the consumers in this study are only those who attend the fitness centres and not those who use the fitness apps outside. Second, the fact that there are few studies based on UTAUT2 to analyse the intention of using fitness app, specifically, the fact that there are no studies based on this model that relate the intention of using the mobile app made available by the fitness centres to members, has limited the conclusions. The third limitation is related to the fact that the study is cross-sectional. However, it is necessary to emphasise the difficulty of conducting a longitudinal study in this field, since this would require the commitment of a large number of fitness centres. Yet, the longitudinal analysis should be considered in future studies to elucidate how temporal changes affect consumers' intention to use fitness apps. Fourth, the study was only conducted in Portugal, so the results may not be generalisable to other countries with different cultures. Another limitation found was that the study was carried out with the entire sample without differentiating the results by age, taking into account that the behaviour of the generations is different in the use of fitness apps.

Therefore, it is recommended as future research to reproduce the current scenario of this research in other countries. It would also be interesting to compare the results obtained in different countries.

References

Adapa, A., Nah, F., Hall, R., Siau, K. and Smith, S. (2018), "Factors influencing the adoption of smart wearable devices", *International Journal of Human-Computer Interaction*, Vol. 34, pp. 399-409, doi: 10.1080/10447318.2017.1357902.

Ajzen, I. (2001), "Nature and operation of attitudes", *Annual Review of Psychology*, Vol. 52, pp. 27-58, doi: 10.1146/annurev.psych.52.1.27.

Akerman, A., Gaarder, I. and Mogstad, M. (2015), "The skill complementarity of broadband internet", *Quarterly Journal of Economics*, Vol. 130 No. 4, pp. 1781-1824.

Alalwan, A. (2016), "Consumer adoption of in Jordan Examining the role of usefulness, ease of use, perceived risk and self-efficacy", *Journal of Enterprise Information Management*, Vol. 29, pp. 118-139.

Alalwan, A. (2020), "Mobile food ordering apps: an empirical study of the factors affecting customer e-satisfaction and continued intention to reuse", *International Journal of Information Management*, Vol. 50, pp. 28-44, doi: 10.1016/j.ijinfomgt.2019.04.008.

Alalwan, A., Dwivedi, Y. and Rana, N. (2017), "Factors influencing adoption of mobile banking by Jordanian bank customers: extending UTAUT2 with trust", *International Journal of Information Management*, Vol. 37, pp. 99-110, doi: 10.1016/j.ijinfomgt.2017.01.002.

Andre, L. (2020), *10 Best Fitness and Gym Management Software for 2020*, Finances Online, available at: https://financesonline.com/best-fitness-gym-management-software/ (accessed 27 March 2020).

Beh, P., Ganesan, Y., Iranmanesh, M. and Foroughi, B. (2019), "Using smartwatches for fitness and health monitoring: the UTAUT2 combined with threat appraisal as moderators", *Behaviour and Information Technology*, Vol. 40 No. 3, pp. 282-299, doi: 10.1080/0144929X.2019.1685597.

Beldad, A. and Hegner, S. (2017), "Expanding the technology acceptance model with the inclusion of trust, social influence, and health valuation to determine the predictors of German users' willingness to continue using a fitness app: a structural equation modeling approach", *International Journal of Human-Computer Interaction*, Vol. 34, pp. 1-12, doi: 10.1080/10447318. 2017.1403220.

Bodet, G. (2006), "Investigating customer satisfaction in a health club context by an application of the tetraclasse model", *European Sport Management Quarterly*, Vol. 6 No. 2, pp. 149-165.

Brem, A. and Voigt, K.-I. (2009), "Integration of market-pull and technology-push in the corporate front end and innovation management — insights from the German software industry", *Technovation*, Vol. 29, pp. 351-367.

Carlson, J. and O'Cass, A. (2010), "Exploring the relationships between e-service quality, satisfaction, attitudes and behaviours in content-driven e-service web sites", *Journal of Services Marketing*, Vol. 24, pp. 112-127, doi: 10.1108/08876041011031091.

Cepeda-Carrión, G., Juan-Gabriel, C. and Valentina, C. (2019), "Tips to use partial least squares structural equation modelling (PLS-SEM) in knowledge management", *Journal of Knowledge Management*, Emerald Publishing, Vol. 23 No. 1, pp. 67-89, doi: 10.1108/JKM-05-2018-0322.

Chopdar, P., Korfiatis, N., Sivakumar, V.J. and Lytras, M. (2018), "Mobile shopping apps adoption and perceived risks: a cross-country perspective utilizing the Unified Theory of Acceptance and Use of Technology", *Computers in Human Behavior*, Vol. 86, pp. 109-128, doi: 10.1016/j.chb.2018. 04.017.

Clement, J. (2020), "Health and fitness app downloads worldwide from 1st quarter 2019 to 2nd quarter 2020", available at: https://www.statista.com/statistics/1127248/health-fitness-apps-downloads-worldwide/ (accessed 8 January 2021).

Davis, F. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, USA: Society for Information Management and The Management Information Systems Research Center, Vol. 13 No. 3, pp. 319-340, doi: 10.2307/249008.

Davis, F., Bagozzi, R. and Warshaw, P. (1989), "User acceptance of computer technology: a comparison of two theoretical models", *Management Science*, Vol. 35, pp. 982-1003, doi: 10.1287/mnsc.35. 8.982.

Du, H., Venkatakrishnan, A., Youngblood, G.M., Ram, A. and Pirolli, P. (2016), "A group-based mobile application to increase adherence in exercise and nutrition programs: a factorial design feasibility study", *JMIR Mhealth Uhealth*, Vol. 4 No. 1, e4, pp. 1-16, doi: 10.2196/mhealth.4900.

Ebbes, P., Papies, D. and van Heerde, H.J. (2016), "Dealing with endogeneity: a nontechnical guide for marketing researchers", in Homburg, C., Klarmann, M. and Vomberg, A. (Eds), *Handbook of Market Research*, Springer, Cham, doi: 10.1007/978-3-319-05542-8_8-1.

Farooq, M., Salam, M., Jaafar, N., Alain, F., Ayupp, K., Radovic Markovic, M. and Sajid, A. (2017), "Acceptance and use of lecture capture system (LCS) in executive business studies: extending UTAUT2", *Interactive Technology and Smart Education*, Vol. 14, pp. 329-348, doi: 10.1108/ITSE-06-2016-0015.

Ferrand, A., Robinson, L. and Valette-Florence, P. (2010), "The intention-to-repurchase paradox: a case of the health and fitness industry", *Journal of Sport Management*, Vol. 84, pp. 83-105.

Ferreira Barbosa, H., García-Fernández, J. and Cepeda-Carrión, G. (2020), "Influência das tecnologias na retenção de sócios em ginásios: Revisão Sistemática", *Movimento*, Vol. 26, p. e 26070, doi: 10. 22456/1982-8918.100316.

Fishbein, M. and Ajzen, I. (1975), *Belief, Attitude, Intention and Behaviour: An Introduction to Theory and Research*, Addison-Wesley, Reading, MA.

Gao, Y., Li, H. and Luo, Y. (2015), "An empirical study of wearable technology acceptance in healthcare", *Industrial Management and Data Systems*, Vol. 115, pp. 1704-1723, doi: 10.1108/ IMDS-03-2015-0087.

García-Fernandez, J., Gálvez-Ruiz, P., Fernandez, J., Velez Colon, L., Pitts, B. and Bernal, A. (2018a), "The effects of service convenience and perceived quality on perceived value, satisfaction and loyalty in low-cost fitness centers", *Sport Management Review*, Vol. 21 No. 3, pp. 250-262, doi: 10.1016/j.smr.2017.07.003.

García-Fernández, J., Martelo-Landroguez, S., Vélez-Colon, L. and Cepeda-Carrión, G. (2018b), "An explanatory and predictive PLS-SEM approach to the relationship between organizational culture, organizational performance and customer loyalty: the case of health clubs", *Journal of Hospitality and Tourism Technology*, Vol. 9 No. 3, pp. 438-454, doi: 10.1108/JHTT-09-2017-0100.

García-Fernandez, J., Gálvez-Ruiz, P., Bohorquez, R., Grimaldi-Puyana, M. and Cepeda-Carrión, I. (2020a), "The relationship between technological capabilities and organizational impact: direct and indirect routes for employed and self-employed personal fitness trainers", *Sustainability*, Vol. 12, pp. 1-19, doi: 10.3390/su122410383.

García-Fernandez, J., Gálvez-Ruiz, P., Grimaldi-Puyana, M., Angosto, S., Fernandez, J. and Bohorquez, R. (2020b), "The promotion of physical activity from digital services: influence of E-lifestyles on intention to use fitness apps", *International Journal of Environmental Research and Public Health*, Multidisciplinary Digital Publishing Institute, Vol. 17 No. 18, p. 6839, doi: 10.3390/ IJERPH17186839.

Gerson, R. (1999), *Members for Life: Proven Service and Retention Strategies for Health-Fitness and Sport Clubs*, Human Kinetics, Champaign, IL.

Gu, R., Oh, L.-B. and Wang, K. (2016), "Multi-homing on SNSs: the role of optimum stimulation level and perceived complementarity in need gratification", *Information and Management*, Vol. 53, doi: 10.1016/j.im.2016.02.009.

Hair, J., Hult, G.T.M., Ringle, C., Sarstedt, M. and Thiele, K. (2017), "Mirror, mirror on the wall: a comparative evaluation of composite-based structural equation modeling methods", *Journal of the Academy of Marketing Science*, Vol. 45, doi: 10.1007/s11747-017-0517-x.

Hair, J.F., Ringle, C., Gudergan, S., Fischer, A., Nitzl, C. and Menictas, C. (2019), "Partial least squares structural equation modeling-based discrete choice modeling: an illustration in modeling retailer choice", *Business Research*, Vol. 12, pp. 115-142.

Hair, J., Ringle, C. and Sarstedt, M. (2012), "Partial least squares: the better approach to structural equation modeling?", *Long Range Planning*, Vol. 45, pp. 312-319, doi: 10.1016/j.lrp.2012.09.011.

Hayes, A. and Scharkow, M. (2013), "The relative trustworthiness of inferential tests of the indirect effect in statistical mediation analysis: does method really matter?", *Psychological Science*, Vol. 24, doi: 10.1177/0956797613480187.

Henseler, J. (2017), "Bridging design and behavioral research with variance-based structural equation modeling", *Journal of Advertising*, Routledge, Vol. 46 No. 1, pp. 178-192, doi: 10.1080/00913367. 2017.1281780.

Henseler, J., Ringle, C. and Sarstedt, M. (2015), "A new criterion for assessing discriminant validity in variance-based structural equation modeling", *Journal of the Academy of Marketing Science*, Vol. 43, pp. 115-135, doi: 10.1007/s11747-014-0403-8.

Henseler, J., Hubona, G. and Ray, P. (2016), "Using PLS path modeling in new technology research: updated guidelines", *Industrial Management and Data Systems*, Vol. 116, pp. 2-20, doi: 10.1108/ IMDS-09-2015-0382.

Hew, J.-J., Lee, V.-H., Ooi, K.-B. and Wei, J. (2015), "What catalyses mobile apps usage intention: an empirical analysis", *Industrial Management and Data Systems*, Vol. 115, doi: 10.1108/IMDS-01- 2015-0028.

Howat, G., Murray, D. and Crilley, G. (1999), "The relationships between service problems and perceptions of service quality, satisfaction, and behavioral intentions of Australian public

sports and leisure center customers", *Journal of Park and Recreation Administration*, Vol. 17, pp. 42-64.

Hu, J. and He, W. (2020), "Examining the impacts of fitness app functionalities", *AMCIS 2020 Proceedings*, Vol. 5, available at: https://aisel.aisnet.org/amcis2020/healthcare_it/healthcare_it/5.

Jones, P., Ratten, V. and Hayduk, T. III (2020), "Sport, fitness, and lifestyle entrepreneurship", *The International Entrepreneurship and Management Journal*, Vol. 16, doi: 10.1007/s11365-020-00666-x.

King, J. (2018), *With Apps, Gyms—And Members—Move beyond Brick-and-mortar*, IHRSA, available at: https://www.ihrsa.org/improve-your-club/with-apps-gyms-and-members-move-beyond-brick-and-mortar/ (accessed 27 March 2020).

Kock, N. (2015), "Common method bias in PLS-SEM: a full collinearity assessment approach", *International Journal of E-Collaboration*, Vol. 11, pp. 1-10, doi: 10.4018/ijec.2015100101.

Lee, J.S. and Kang, J.-H. (2015), "Effects of sport event satisfaction on team identification and revisit intent", *Sport Marketing Quarterly*, Vol. 24, pp. 225-234.

Lee, H.S., Kim, T.G. and Choi, J.Y. (2012), "A study on the factors affecting smart phone application acceptance", *3rd International Conference on e-Education, e-Business, e-Management and e-Learning*, Singapore, pp. 27-34.

Liu, D., Maimaitijiang, R., Gu, J., Zhong, S., Zhou, M., Wu, Z., Luo, A., Lu, C. and Hao, Y. (2019), "Using the unified theory of acceptance and use of technology (UTAUT) to investigate the intention to use physical activity apps: cross-sectional survey", *JMIR mHealth and uHealth*, Vol. 7 No. 9, e13127, doi: 10.2196/13127.

McDougall, G. and Levesque, T. (2000), "Customer satisfaction with services: putting perceived value into the equation", *Journal of Services Marketing*, Vol. 14, pp. 392-410, doi: 10.1108/08876040010340937.

Miladinovic, J. and Hong, X. (2016), "A study on factors affecting the behavioral intention to use mobile shopping fashion apps in Sweden", available at: http://hj.diva-portal.org/smash/get/diva2:933382/FULLTEXT01.pdf.

Molina, M.D. and Myrick, J.G. (2020), "The "how" and "why" of fitness app use: investigating user motivations to gain insights into the nexus of technology and fitness", *Sport in Society*, Routledge, pp. 1-16, doi: 10.1080/17430437.2020.1744570.

Murray, D. and Howat, G. (2002), "The relationships among service quality, value, satisfaction, and future intention of customers at an Australian sports and leisure centre", *Sport Management Review*, Vol. 5, pp. 25-43.

Nair, P.K., Ali, F. and Leong, L.C. (2015), "Factors affecting acceptance and use of ReWIND: validating the extended unified theory of acceptance and use of technology", *Interactive Technology and Smart Education*, Vol. 12 No. 3, pp. 183-201, available at: https://www.learntechlib.org/p/172536.

Neeraj, D., Neelika, A., Nikita, D. and Anil, G. (2019), "Consumer adoption of smartphone fitness apps: an extended UTAUT2 perspective", *Journal of Indian Business Research*, Vol. 12, doi: 10.1108/JIBR-05-2018-0158.

Oliveira, T., Thomas, M., Baptista, G. and Campos, F. (2016), "Mobile payment: understanding the determinants of customer adoption and intention to recommend the technology", *Computers in Human Behavior*, Vol. 61, pp. 404-414, doi: 10.1016/j.chb.2016.03.030.

Orbell, S., Hodgldns, S. and Sheeran, P. (1997), "Implementation intentions and the theory of planned behavior", *Personality and Social Psychology Bulletin*, Vol. 23, p. 945, doi: 10.1177/0146167297239004.

Palau-Saumell, R., Forgas, S., Sánchez-García, J. and Robres, E. (2019), "User acceptance of mobile apps for restaurants: an expanded and extended UTAUT-2", *Sustainability*, Vol. 11, p. 1210, doi: 10.3390/su11041210.

Papies, D., Ebbes, P. and van Heerde, H.J. (2017), "Addressing endogeneity in marketing models", in Leeflang, P., Wieringa, J., Bijmolt, T. and Pauwels, K. (Eds), *Advanced Methods for Modeling*

Markets. International Series in Quantitative Marketing, Springer, Cham, doi: [10.1007/978-3-319-53469-5_18](10.1007/978-3-319-53469-5_18).

Pedragosa, V. and Cardadeiro, E. (2021), *Barómetro Do Fitness Em Portugal 2020*, AGAP, Lisboa: Edições.

Pedragosa, V., Biscaia, R. and Correia, A. (2015), "The role of emotions on consumers' satisfaction within the fitness context", *Motriz. Revista de Educação Física*, Vol. 21, pp. 116-124, doi: [10.1590/S1980-65742015000200002](10.1590/S1980-65742015000200002).

Podsakoff, P., MacKenzie, S., Lee, J.-Y. and Podsakoff, N. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88, pp. 879-903, doi: [10.1037/0021-9010.88.5.879](10.1037/0021-9010.88.5.879).

Richter, N., Cepeda-Carrion, G., Roldán, J. and Ringle, C. (2015), "European management research using partial least squares structural equation modeling (PLS-SEM)", *European Management Journal*, Vol. 33, doi: [10.1016/j.emj.2014.12.001](10.1016/j.emj.2014.12.001).

Ringle, C., Wende, S. and Becker, J. (2015), *SmartPLS 3*, SmartPLS GmbH, Boenningstedt.

Rust, R.T., Zahorik, A.J. and Keiningham, T.L. (1995), "Return on quality (ROQ): making service quality financially accountable", *Journal of Marketing*, SAGE Publications, Vol. 59 No. 2, pp. 58-70, doi: [10.1177/002224299505900205](10.1177/002224299505900205).

Sarstedt, M., Ringle, C.M. and Hair, J.F. (2017), "Partial least squares structural equation modeling", in Homburg, C., Klarmann, M. and Vomberg, A. (Eds), *Handbook of Market Research*, Springer, Cham, doi: [10.1007/978-3-319-05542-8_15-1](10.1007/978-3-319-05542-8_15-1).

Shamim, T.M., Raymond, C., Yukun, B. and Babur, H.M. (2019), "Acceptance and use predictors of fitness wearable technology and intention to recommend: an empirical study", *Industrial Management and Data Systems*, Emerald Publishing, Vol. 119 No. 1, pp. 170-188, doi: 10.1108/IMDS-01-2018-0009.

Streukens, S. and Leroi-Werelds, S. (2016), "Bootstrapping and PLS-SEM: a step-by-step guide to get more out of your bootstrap results", *European Management Journal*, Vol. 34 No. 6, pp. 618-632, doi: [10.1016/j.emj.2016.06.003](10.1016/j.emj.2016.06.003).

Thompson, W.R. (2021), "Worldwide survey of fitness trends for 2021", *ACSM's Health and Fitness Journal*, Vol. 25 No. 1, available at: https://journals.lww.com/acsm-healthfitness/Fulltext/2021/01000/Worldwide_Survey_of_Fitness_Trends_for_2021.6.aspx.

Valcarce, M. and Díez, C. (2018), "Influencia de una app en la adherencia a la práctica deportiva: protocolo de estudio", *Emotion: Revista de Educación, Motricidad e Investigación*, Vol. 11, pp. 16-34.

Venkatesh, V. and Davis, F. (2000), "A theoretical extension of the technology acceptance model: four longitudinal field studies", *Management Science*, Vol. 46, pp. 186-204, doi: 10.1287/mnsc.46.2.186.11926.

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003), "User acceptance of information technology: toward a unified view", *MIS Quarterly*, Management Information Systems Research Center, University of Minnesota, Vol. 27 No. 3, pp. 425-478, doi: [10.2307/30036540](10.2307/30036540).

Venkatesh, V., Thong, J.Y.L. and Xu, X. (2012), "Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology", *MIS Quarterly*, Management Information Systems Research Center, University of Minnesota, Vol. 36 No. 1, pp. 157-178, doi: [10.2307/41410412](10.2307/41410412).

Vinnikova, A., Lu, L., Wei, J., Fang, G. and Yan, J. (2020), "The use of smartphone fitness applications: the role of self-efficacy and self-regulation", *International Journal of Environmental Research and Public Health*, Vol. 17, pp. 1-16, doi: 10.3390/ijerph17207639.

Voth, E.C., Oelke, N.D. and Jung, M.E. (2016), "A theory-based exercise app to enhance exercise adherence: a pilot study", *JMIR mHealth and uHealth*, Vol. 4 No. 2, doi: 10.2196/mhealth.4997.

Yoshida, M. and James, J. (2010), "Customer satisfaction with game and service experiences: antecedents and consequences", *Journal of Sport Management*, Vol. 24, pp. 338-361, doi: 10. 1123/jsm.24.3.338.

Yuan, S., Ma, W., Kanthawala, S. and Peng, W. (2015), "Keep using my health apps: discover users' perception of health and fitness apps with the UTAUT2 model", *Telemedicine Journal and E-Health: The Official Journal of the American Telemedicine Association*, Vol. 21, doi: 10.1089/tmj. 2014.0148.

Zeithaml, V., Berry, L. and Parasuraman, A. (1996), "The behavioral consequences of service quality", *Journal of Marketing*, Vol. 60, doi: 10.2307/1251929.

Fitness centre app and customer satisfaction

Corresponding author
Helena Ferreira Barbosa can be contacted at: helena.barbosa@ipbeja.pt

Appendix

Items	References
Performance expectancy 1. I find the fitness app of my fitness centre useful 2. By using my fitness app I increase the opportunity to achieve things that are important to me 3. My fitness app helps me perform activities faster 4. In general, the use of my fitness app is advantageous	Venkatesh *et al.* (2012) Nair *et al.* (2015)
Effort expectancy 1. Learning to use my fitness app is easy 2. My interaction with my fitness app is clear and understandable 3. My fitness app is easy to use 4. It is easy to become skilful in using my fitness app	Venkatesh *et al.* (2012)
Social influence 1. People who are important to me think I should use the fitness app 2. People who influence my behaviour think that I should use the fitness app 3. People whose opinion I value would like me to use the fitness app 4. Members of the fitness centre staff have been helpful in use of the fitness app 5. In general, the fitness centre has supported the use of the fitness app	Venkatesh *et al.* (2012) Nair *et al.* (2015)
Facilitating conditions 1. I have the resources necessary to use the fitness app 2. I have the knowledge necessary to use the fitness app 3. The fitness app is compatible with other technologies I use (e.g. mobile phone) 4. I can get help from the fitness centre staff when I have difficulties using the fitness app	Venkatesh *et al.* (2012)
Hedonic motivation 1. Using the fitness app is fun 2. Using the fitness app is enjoyable 3. Using the fitness app is very entertaining	Venkatesh *et al.* (2012)
Habit 1. The use of the fitness app has become a habit for me 2. I'm addicted to using the fitness app 3. I must to use the fitness app 4. Using the fitness app has become natural to me	Venkatesh *et al.* (2012)
Behavioural intention 1. I intend to continue using the fitness app in the future 2. I will always try to use the fitness app in my daily life 3. I plan to continue to use the fitness app frequently 4. I intend to make positive comments about the fitness app to other people	Venkatesh *et al.* (2012) Adapted from Zeithaml *et al.* (1996)
Use behaviour 1. I use the fitness app frequently	Venkatesh *et al.* (2012)
Overall customer satisfaction I am satisfied with the programs and services of this fitness centre I am happy with the programs and services of this fitness centre I am pleased to have taken the decision to become a member of this fitness centre My decision to be a member of this fitness centre was successful	García-Fernández *et al.* (2018a)

Table A1.
Questionnaire