



The use of fitness apps on customer satisfaction and retention: The fitness centres context

Doctoral program of *Gestión Estratégica y Negocios Internacionales*

PhD Thesis by:

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Seville, July 2021

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Universidad de Sevilla

Doctoral program of *Gestión Estratégica y Negocios Internacionales*

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Dissertation submitted to the Universidad de Sevilla to fulfil the requirements necessary to obtain a PhD degree, carried out under the scientific supervision of Dr. Gabriel A. Cepeda Carrión and Dr. Jerónimo García-Fernández.

I

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“There is a driving force more powerful than steam, electricity and nuclear power:
the will”.

Albert Einstein

II

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To João, Francisco, and Rodrigo, my beloved husband and children.

III

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ABSTRACT

The objective of this study is to analyse the use of fitness centre apps and its influence on customer satisfaction and retention. In this sense, three studies were conducted, one systematic review and two cross-sectional, quantitative studies. The systematic review was carried out using the PRISMA method. The other two studies used the extended unified theory of acceptance and use of technology (UTAUT2) as a base model. All hypothesised relationships used partial least squares structural equation modelling (PLS-SEM), with data from 1,678 fitness customers from Portugal. The results highlighted the importance of the study of technologies in customer retention. The results also support the ability of UTAUT2 in predicting the customer's intention to use the fitness centre and that the use varies according to customer characteristics. Behavioural intentions are positively related both to the use behaviour of the fitness centre app and to customer overall satisfaction. The suggested that fitness centres invest in the use of a good application, since their use is related to customer overall satisfaction and, thus, indirectly with retention, which benefits the fitness centres.

Keywords: Fitness app, fitness centres, health clubs, consumer, UTAUT2, PRISMA, PLS-SEM, Multi-group analysis (MGA).



Chapter I: Introduction

At this point the introduction of the work will be presented, with the presentation of the problem, general and specific objectives, exposing the methodology used to answer them and the main implications of the work. This section will also present the organization of the dissertation.

1. Introduction.

Regular physical activity proves to be very beneficial in preventing and controlling non-communicable diseases, benefits mental health, including prevention of cognitive decline and symptoms of depression and anxiety, contributes to healthy weight maintenance and general well-being (World Health Organization [WHO], 2020a). Four to five million deaths per year could be prevented if the global population were more physically active (WHO, 2020a). The Covid-19 pandemic has further contributed to sedentary behaviour and physical inactivity.

Specifically, in the context of fitness centres, the pandemic has also contributed to an increase in membership dropouts at fitness centres, as well as a reduction in enrolment and revenue (EuropeActive, 2021). According to the latest European Health & Fitness Market Report, there were 10 million dropouts by the end of 2020, revenues decreased by 1/3 and there were 7% fewer inscriptions, compared to 2019. Before the pandemic the practice of physical activity in fitness centres was an increasing reality, which led the number of fitness centres to gradually increase. However, this increase contributed to a lower tolerance of members in the face of some dissatisfaction, translating into early dropout (García-Fernández et al., 2016; Pedragosa, 2021a). Therefore, although the pandemic has affected fitness centres, when it comes to the issue of retention, this was already one of the main problems in the industry (Clavel San Emeterio et al., 2017; McCarthy, 2004; Pedragosa, 2021a). The concept of retention in fitness centres refers to member retention and is considered key to their profitability (Ferrand et al., 2010).

Based on this perspective, strategies must be found to maintain physical activity, notably in fitness centres, not only from a physical and psychological health perspective for the population but from a "health" perspective for companies,



keeping members active for longer, increasing retention. In this sense, fitness centres have been differentiating their offer in an attempt to be compatible with demand, through technological innovation services (e.g. virtual classes transmitted by social networks, wearable fitness technology, on-demand, fitness apps). Long before the pandemic situation that overwhelmed the market, the use of technology was already a present reality in the fitness industry. Technology is part of customer perceived value, related to quality and therefore also to satisfaction and in turn to retention, as satisfaction and service quality are indirectly related to retention (García-Fernández et al., 2017). Fitness apps, for example, are considered technological tools to promote physical activity (García-Fernández et al., 2020; Oyibo & Vassileva, 2020) and specifically the use of fitness centre app makes members stay engaged for longer, increasing retention (Ferreira Barbosa & Pedragosa, 2021). In addition to knowing customer's use behaviour regarding fitness apps, understanding how this use is related to customer satisfaction with the centre is also important, given the relationship between satisfaction and retention and the importance of the latter for companies' profitability. This being said and given the gap in the existence of studies that address the fitness centres apps, the desire to study the apps of fitness centres was raised. Therefore, the objectives of this work were established.

1.1. Objectives.

According to the above, the overall objective of this work is analysing the use of fitness centre apps and its influence on customer satisfaction and retention. Specifically, three specific objectives were established:

1. Identifying the influence of social networks and technologies on customer retention in fitness centres;
2. Analyse the intention to use fitness centre apps and their relationship with customer overall satisfaction;
3. Analyse whether there are significant differences in the use of fitness centre apps, and also in customer overall satisfaction, in relation to age, gender, academic qualifications, training frequency and registration time.



To answer each of these objectives, three studies were conducted. One systematic literature review and two quantitative, cross-sectional, scientific research studies.

To answer our first objective, identifying the influence of social networks and technologies on customer retention in fitness networks, an exhaustive search on the impact of technologies and social networks on member satisfaction and retention was conducted in 4 indexed databases (Web of Science, Scopus, EBSCO e PubMed) throughout PRISMA method (Moher et al., 2009).

Having confirmed the influence of technologies on customer retention in fitness centres, a research on the use of technologies in this market was initiated. With this research it was found that the market of fitness apps was growing (Beldad & Hegner, 2017). The downloads of the apps were increasing at a rapid pace and these were revealed to be a rising trend in the fitness market for 2021 (Thompson, 2021). Despite the extensive literature on the use of fitness apps (Hew et al., 2015; Neeraj et al., 2019; Yuan et al., 2015) no studies were found on the use of fitness centre apps, so it was decided to analyse the intention to use fitness centre apps and their relationship with customer overall satisfaction.

With the second article, the influence of the use of fitness centre apps on the customers' overall satisfaction with the centre was verified. However, it was found that the intention to use these applications is not homogeneous and that it varied according to some variables, namely age, gender, academic qualifications, training frequency and time of registration. Thus, a third article was designed, with the aim of analyse whether there were significant differences in the use of fitness centre apps, and also in customer overall satisfaction, in relation to age, gender, academic qualifications, training frequency and time of registration. The influence of behavioural intentions on customer overall satisfaction and use behaviour was found to vary according to customer's socio-demographic characteristics and time of registration.

For the two quantitative studies, several models that explore customer's intentions and actual use of new technologies were analysed (theory of reasoned action, TRA (Fishbein & Ajzen, 1975); theory of planned behaviour, TPB (Ajzen, 1991); technology acceptance model, TAM (Davis et al., 1989); unified theory of



technology acceptance and use, UTAUT (Venkatesh et al., 2003); and extended unified theory of technology acceptance and use, UTAUT2 (Venkatesh et al., 2012)). The UTAUT2 model was chosen since this model is directed at the customer's perspective, which is what we intend to study. The data from these two studies were analysed using SmartPLS 3.3.2 software (Ringle et al., 2015). This software specializes in models that follow the PLS-SEM (Partial Least Squares Structural Equation Modelling) approach. These three studies provide important information for fitness centre managers by addressing the importance of fitness centre apps use in customer satisfaction and retention but also provides important information for the sports marketing literature by addressing the UTAUT2 theory in the fitness context by adding another measure, customer overall satisfaction.

2. Organization of the dissertation report.

This document is organized to present the work completed as part of the doctoral dissertation. It is divided into seven chapters. The introduction, objectives of the study, and organization of the dissertation were all found in the current chapter, Chapter I. Chapter II is a theoretical framework that will begin by addressing the theoretical models used to understand customer adoption of technologies in general and in the sports industry. Following that, the fitness centre customer will be examined in terms of behaviour, retention, and satisfaction. To conclude, the study's context, the fitness context, business models, evolution, trends, industry response to the Covid-19 pandemic, and addressing the technologies used will be discussed. The methodology, which includes the study design, procedures employed, data collecting, presentation of the measurement instrument, and data analysis, will be presented in Chapter III. The three scientific publications are presented in the following chapters (Chapters IV, V, and VI). Chapter IV contains the first published article, Chapter V contains the second published article, and Chapter VI contains the final article produced, which has not yet been submitted to any journal. Finally, in Chapter VII, an overall conclusion of the work will be presented, including the practical and theoretical implications and limitations of the study, as well as proposals for future research. The references used for this dissertation, as well as



the appendix, project timeline, and measuring instrument, are listed at the end of the report.

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Chapter II: Theoretical Framework

Considering that the general objective of the work is to analyse the adoption of a technological tool (app) in the context of fitness centres and its influence on customer satisfaction and retention, the theoretical framework was carried out in order to address these issues. Thus, this chapter will explain the theoretical framework used to understand and adopt new technologies by customer. Customer behaviour, satisfaction and retention will be analysed. Finally, the context where this study will be applied, the fitness context, will be presented. From the concept and evolution to its relationship with physical activity, trends, response to the current challenge of the covid-19 pandemic without forgetting the approach to technological resources used in the industry.

1. Theoretical models used to understand the adoption of technologies.

Product adoption is the process by which a consumer begins to buy and use a new good, service or idea. In contrast, product diffusion describes how the use of the product spreads through a given population (Mannan & Haleem, 2017). Computer and information technologies have expanded rapidly. Explaining user acceptance of new technologies is often described as one of the most mature areas of research in the contemporary literature on information and communication systems (Hu et al. 1999). Research in this area has resulted in several theoretical models, with roots in information systems, psychology and sociology, that explain variation in individual intention to use technology (Davis et al., 1989; Venkatesh et al., 2003, 2012).

A variety of theoretical models have been established to explore customer intentions and the actual use of new technologies (Beh et al., 2019). The theoretical models used to understand the adoption of mobile technologies include theory of reasoned action (TRA) (Fishbein & Ajzen, 1975), theory of planned behaviour (TPB) (Ajzen, 1991), technology adoption model (TAM) (Davis et al., 1989), the unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003) and the extended unified theory of acceptance and use of technology (UTAUT2) (Venkatesh et al., 2012). From the customer perspective, these two models, UTAUT

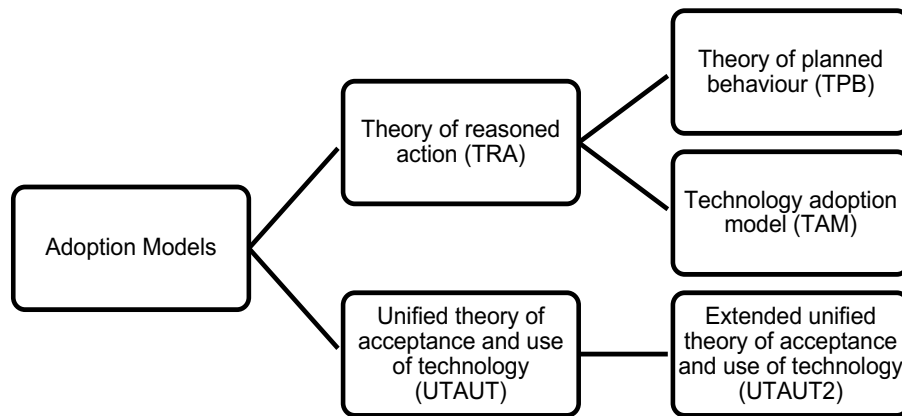


and UTAUT2, have greater predictive power compared to other technology adoption models (Venkatesh et al., 2012).

The evolution of the adoption models analysed can be seen in figure 1. The theory of planned behaviour (TPB) and the technology adoption model (TAM) are both derived from theory of reasoned action (TRA). After comparing the similarities and differences between models used in the information system context (including TRA, TPB and TAM), Venkatesh et al. (2003) developed the unified theory of technology acceptance and use (UTAUT). Subsequently, Venkatesh et al. (2012), extended the UTAUT model to the UTAUT2 model in regard to customers' perspectives.

Figure 1

Adoption models analysed (of own elaboration)



1.1. TRA Model.

The theory of rational action (TRA) holds that an individual's behaviour is determined by the intention individual is determined by the intention that the individual possesses to perform certain behaviour, and this behaviour intention, in turn, is influenced by the individual's attitude and the subjective norms that exert influence over him/her (Fishbein & Ajzen, 1975). The basic tenet of the theory of rational action (TRA) indicates therefore that behaviours are largely intentional (Fishbein & Ajzen, 1975). In turn, these intentions are predicted by the individual's



attitudes towards the behaviour and any relevant subjective norms that may influence the performance of the behaviour (Fishbein & Ajzen, 1975). Figure 2 explains the causal relationship advocated by the theory.

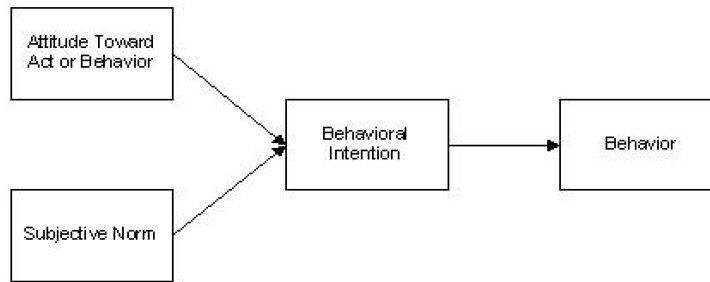
According to TRA, the proximal determinant of a behaviour is a behavioural intention, which in turn is determined by attitude and subjective norm. Attitude captures a person's overall assessment of the performance of the behaviour, it refers to the positive or negative feelings that an individual has about performing a particular behaviour, results from individuals' evaluations of their beliefs about the consequences that performing a particular behaviour will generate for them, as well as their assessment of the desirability of these consequences. Subjective norms refer to the individual's perception of the opinion of others about whether or not to perform the analysed behaviour (Fishbein & Ajzen, 1975). At the end of the topic, in Table 1, it is possible to find a resume definition of the model's constructs.

The TRA model has been used in various studies and industries, in the tourism industry (Lamsfus et al., 2014; Perez-Aranda et al., 2021), social networking services (Salehan et al., 2018), applied to breast cancer screening in women (Firouzbakht et al., 2021), in the banking industry (Ali et al., 2017; Amin, 2013; Lishomwa & Phiri, 2020) but also in the sports industry (Breslin et al., 2019; Yim & Byon, 2020).

Drawing from social psychology, TRA theory is a precursor to many models and a frequently used theory of human behaviour to explain technology adoption (Venkatesh et al. 2003). The theory of rational action (TRA) proves to be, however, insufficient to determine the factors that impact the decision to use a technology by consumers, to the extent that it does not consider subjective variables that probably influence their decision. Recognising that most human behaviours are subject to obstacles, Ajzen (1991) introduced TPB, which generalises TRA by adding a third insight: perceived behavioural control. In this sense, derived from the theory of rational action (TRA), the theory of planned behaviour (TPB) emerges.



Figure 2
 TRA Model (Fishbein & Ajzen, 1975)



1.2. TPB Model.

The theory of planned behaviour (TPB) is an extension of the theory of rational action (TRA). Although TPB and TRA both focus on explaining individuals' behaviour, unlike TRA which derives from social psychology, TPB is a psychosocial theory (Gagnon et al., 2006).

Acknowledging that most human behaviours are subject to obstacles, Ajzen (1991) added a third insight to the TRA model, perceived behavioural control (PBC). Figure 3 clarifies the relationships advocated by the theory. As a general model, TPB was designed to explain most human behaviours (Ajzen 1991). TPB has expanded TRA by postulating that both intentions and behaviours are predicted by the individual's perceived behavioural control. Perceived behavioural control refers to the perceived ease or difficulty of performing a behaviour (Ajzen 1985). Thus, the TPB model proposes that if an individual believes that he is capable of performing a behaviour, the probability of his intention to perform it increases and consequently he will eventually perform it. Similarly, despite positive attitudes and norms towards a behaviour, if an individual is unable to perform it, it is unlikely to happen. TPB uses PBC for individual actions that are not under volitional control. PBC has the direct influence on actual behaviour as well as the indirect effect through behavioural intentions. Ajzen (1991), understands that behavioural intention is reflected in behaviour if the person willingly decides to adopt the behaviour or not, i.e. by the perceived control they have over the behaviour they desire. Behaviour is the product of a series of cognitive and affective events often preceded by the conscious



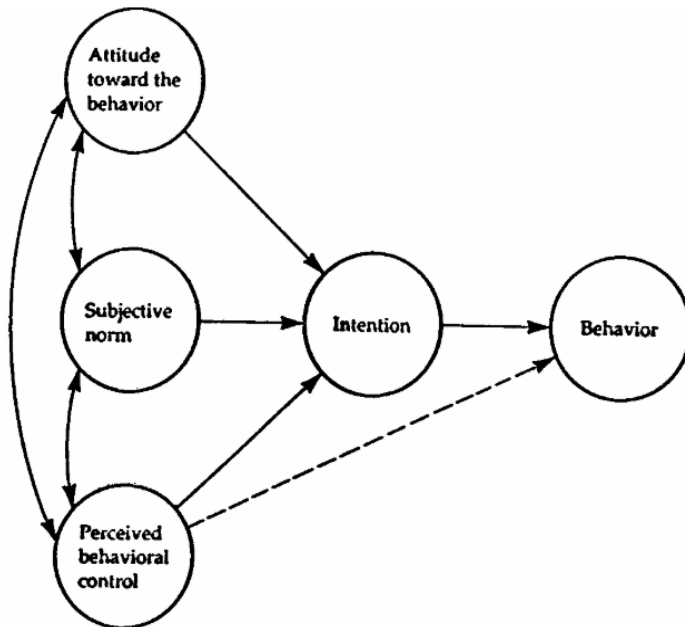
intention to act. At the end of the topic, in Table 1, it is possible to find a resume definition of the model's constructs.

TPB is a well-researched model that has been shown to predict behaviour across a variety of scenarios. TPB has been used in e-commerce adoption (Pavlou & Fygenson, 2006), in Tourism (Lin et al., 2020), in banking industry (Ali et al., 2017b) but also in the sports industry (Kim & Kim, 2021; Song et al., 2018; Yim & Byon, 2020).

Like TPB, the technology adoption model (TAM) is also derived from the TRA model.

Figure 3

TPB Model (Ajzen, 1991)



1.3. TAM Model.

Davis et al. (1989) and Davis (1989) developed the technology adoption model (TAM) (figure 4) to explain the acceptance of information system (IS) and information technology (IT) and found the existence of two beliefs in influencing the use of IS, with a considerable impact on user attitude: perceived usefulness and perceived ease of use. However, not only are contained in the TAM the perceived usefulness



and the perceived ease of use, but also the behavioural intentions. Thus, TAM explains user motivation by three factors: perceived usefulness, perceived ease of use, and attitude towards use. At the end of the topic, in Table 1, it is possible to find a resume definition of the model's constructs.

TAM model has been usually used in estimating the probability that consumers will accept or reject an innovative technology. It argues that when users are introduced to a new technology, a number of factors influence their decision on how and when to use it, namely: perceived usefulness and perceived ease of use (Davis et al., 1989). In addition to predicting whether the individual's behaviour towards a new technological tool is positive, also explains why this same behaviour is positive, through a basic system on the impact of external factors on the attitudes and intentions to use a technology, using a reduced number of variables that collect all this information (Davis et al., 1989).

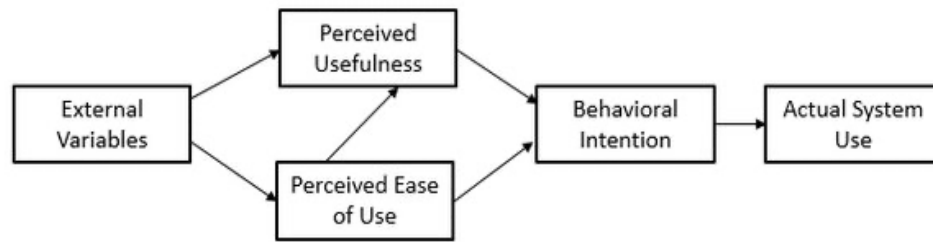
TAM is a simple but solid model that can explain the key factors of consumers' adoption of new technologies and is one of the most cited models in the field of technology acceptance and in the field of information management (Taherdoost, 2018). TAM has demonstrated its usefulness in explaining technology use in different contexts such as in e-commerce (Pavlou & Fygenson, 2006) the healthcare industry (Nasir & Yurder, 2015) or the banking industry (Bidarra et al., 2013). In the sports industry this model has been widely used (Ha et al., 2017; Hur et al., 2012; Lunney et al., 2016; Song et al., 2018). Specifically in the fitness context, several studies have applied the technology acceptance model (TAM) as a theoretical basis to examine individuals' intentions to use health and fitness apps (Beldad & Hegner, 2017; Byun et al., 2018). 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). This model does not address intrinsic motivations, making TAM's ability to apply in a customer context difficult, as acceptance and use of information technology is not only to perform tasks but also to satisfy emotional needs.

TAM was one of the models that served as a starting point for the development of the unified theory of acceptance and use of technology (UTAUT).



Figure 4

TAM Model (Davis et al., 1989)



1.4. UTAUT Model.

Venkatesh et al. (2003), compared the similarities and differences between eight models previously used in the information system context, including TRA, TPB and TAM, and developed the unified theory of acceptance and use of technology (UTAUT). Thus, UTAUT model was proposed as a new IT acceptance theory (Venkatesh et al., 2003). This model (Figure 5) 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 a given technology will help him 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 realizes 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 organizational and technical infrastructure to support the use of the system (Venkatesh et al., 2003). At the end of the topic, in Table 1, it is possible to find a resume definition of the model's constructs. The use of technology is explained directly by the intention of use and the facilitating conditions. In turn, the intention of utilization is directly determined by the performance expectancy, effort expectation and social influence. Individual differences (namely, age, gender and experience) are moderating

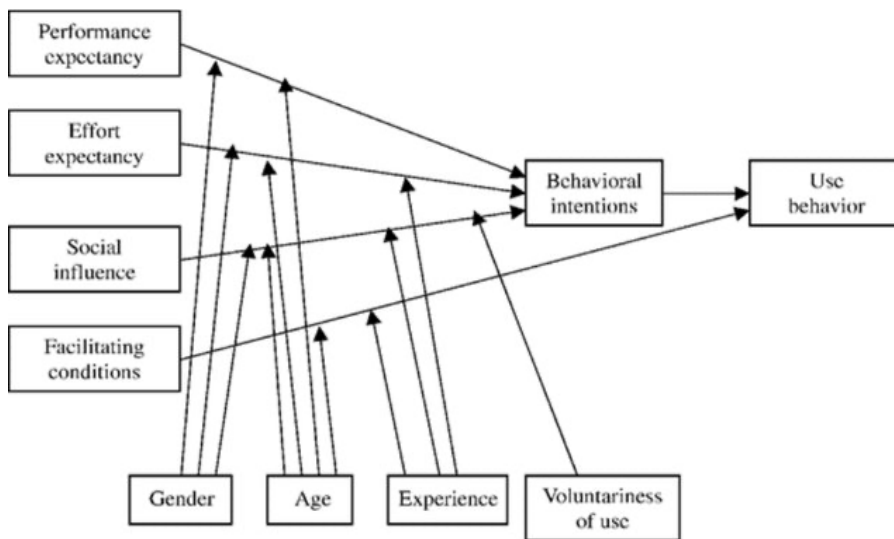


variables of the relationships between the four nuclear variables, behavioural intention and the use of technology (Venkatesh et al., 2012).

The UTAUT model has been widely used to explain technology adoption in various contexts such as hospitals, crowd-funding, immigration (Joa & Magsamen-Conrad, 2021; Kim et al., 2016; Li et al., 2018). The unified theory of acceptance and use of technology (UTAUT) has also been heavily used in the sports industry (Lee et al., 2017; Ndayizigamiye et al., 2020), specifically in the context of fitness (Reyes-Mercado, 2018) and the adoption of fitness apps (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 in regard to customers' perspectives.

Figure 5

UTAUT Model (Venkatesh et al., 2003)



1.5. UTAUT2 Model.

In UTAUT2 model (Figure 6), 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 customer



acceptance and use of technology (Beh et al., 2019). Hedonic motivation is added to the UTAUT2 model in order 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 organizational 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) (Alalwan, 2020; Chopdar et al., 2018). 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). However, little or no attention has been given in the specific context of fitness centre app use. Since the study is directed to the customer’s perspective, UTAUT2 model was the one selected for the context of the study.

Figure 6

UTAUT2 Model (Venkatesh et al., 2012)

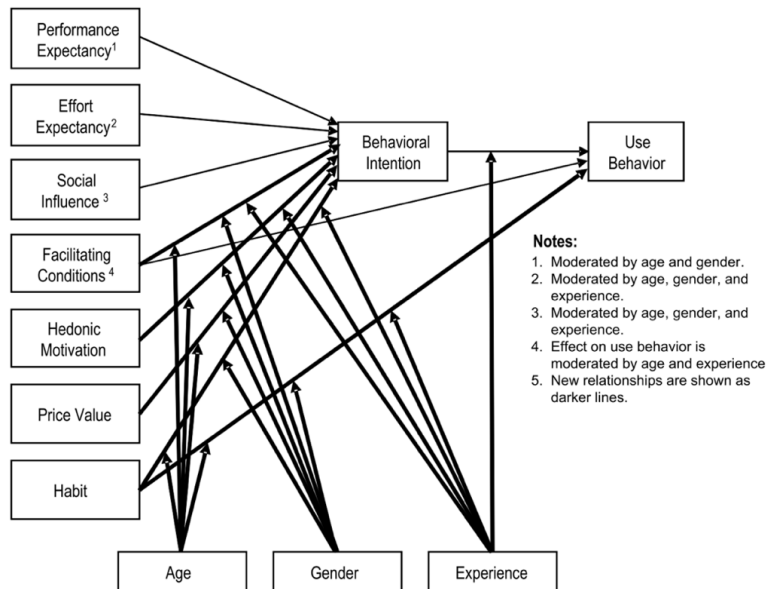


Table 1 contains a summary definition of the main constructs of each of the models addressed.

Table 1

TRA, TPB, TAM, UTAUT and UTAUT2 main constructs resume (Ajzen, 1991; Davis et al., 1989; Fishbein & Ajzen, 1975; Venkatesh et al., 2003, 2012)

	Construct	Definition
TRA (1975)	Attitude toward behaviour	Integrates the TRA and TPB model and it refers to an individual's positive or negative feeling about performing the target behaviour.
	Subjective norm	Integrates the TRA and TPB model and is understood as the person's perception that most people who are important to him think he should or should not perform the behaviour in question.
TPB (1989)	Perceived behavioural control	Integrates the TPB model and is the perceived ease or difficulty of performing the behaviour.
TAM (1991)	Perceived ease of use	It integrates the TAM model and is understood as the degree to which a person believes that using a given technology will be effortless.
	Perceived utility	Integrates the TAM model and is defined as the degree to which a person believes that using a technology will improve their performance.
	Behavioural Intention	It integrates the TRA, TPB, TAM, UTAUT and UTAUT2 models, referring to the intention to consume a certain technological product or service.
	Use behaviour	It integrates the TRA, TPB, TAM, UTAUT and UTAUT2 models, referring to the act of consuming a given technological product or service.
UTAUT (2003)	Performance expectancy	It integrates the UTAUT and UTAUT2 models and it indicates the degree to which an individual believes that using a given technology will help him to gain performance at work.
	Effort expectancy	It integrates the UTAUT and UTAUT2 models, referring the degree of ease associated with using the system.
	Social influence	It integrates the UTAUT and UTAUT2 models and it refers to the degree to which an individual realizes that

(Continued on next page)



		his social referents believe they should use the new system.
	Facilitating conditions	It integrates the UTAUT and UTAUT2 models and refers to the degree to which an individual believes there is an organizational and technical infrastructure to support the use of the system.
	Hedonic motivations	Integrated from the UTAUT2 Model, referring to the fun and/or pleasure provided to the individual when using the technology. The inclusion of this factor was justified by its importance in the consumption context.
UTAUT2 (2012)	Price	Integrated from the UTAUT2 Model, considering that price can have a significant impact on the user's use of technology. The price value is positive when the benefits of using a technology are perceived as superior compared to the monetary cost, thus, the price value has a positive impact on the intention
	Habit	Integrated from the UTAUT2 Model, it refers to the degree to which the individual tends to use technology automatically as a result of a learning process.

The UTAUT2 model was chosen because it focuses on the customer, as previously indicated. A clear understanding of customer behaviour is crucial in this regard. As previously mentioned, the overall purpose of this dissertation is to investigate the use of fitness centre apps and their impact on customer satisfaction and retention, which explains why customer behaviour, specifically customer satisfaction and retention, is so important to address.

2. Customer.

2.1. Customer behaviour.

Customer behaviour has evolved over time. According to Sheth (2021), as a discipline, it is about 50 years old. Just as marketing began to separate from economics (with a focus on distribution channels), customer behaviour began to separate from market research. Katona (1951) first distinguished the rational customer advocated in economics from the behavioural customer observed in



psychology, which turned out to be the key to the beginning of customer behaviour as a stand-alone discipline.

Understanding customer behaviour is crucial for business success, for companies to build long-term relationships with their customers (Aren et al., 2013) and use their power in influencing business activities (Zhang et al., 2017), growing sales (Roberts & Alpert, 2010) and creating profit for companies (Bowden, 2009).

There are behaviours that indicate that customers are forming bonds with an organisation (Howat et al., 1999). These favourable behaviours include saying positive things about the company to others (word-of-mouth communication), recommending the company or service, paying a medium price to the company and remaining loyal to it. Loyalty can manifest itself in various ways, expressing a preference for one company over others, continuing to rely on it, or increasing business with the company in the future (Zeithaml et al., 1996). Previous research has observed that customer satisfaction have been positively correlated customer's behavioural intentions (Eskiler & Altunışık, 2021; Howat et al., 1999; McDougall & Levesque, 2000; Murray & Howat, 2002). Effectively, there is scientific evidence that customers tend to consume a particular brand if they have a positive experience with its products or services and recommend it if they are satisfied with it (Javornik & Mandelli, 2012).

Specifically, in the fitness industry, which was the context where the study was developed, creating positive customer behaviour in members through satisfaction with products and services is considered one of the biggest challenges for fitness centres (Pedragosa, 2021b).

There is scientific evidence that there are differences in behavioural intentions with fitness centres according to customer characteristics. The evidence points to men between 31 and 40 years old with 3 to 6 months stay in the fitness centre, as those who reveal more behavioural intentions with the organisation (García-Fernández et al., 2017).

Engaged customers are quite valuable for companies and can guarantee the organisation sustained growth, since, as has been seen, the customer who engages with the brand tends to favour it, through the purchase and use of its products and services. This indicates that cultivating a good relationship with customers is crucial



for companies. In this regard, technological development has proved important as it has led to increased customer control over their consumption experiences and has brought the customer closer to the organisation. The relationship between the customer and the organization is no longer unidirectional (organization-customer), but bidirectional, allowing the customer to interact with the organization (Pedragosa, 2021b).

It seems clear that all these aspects are fundamental to the success of the sports organisation. In this sense, companies use resources to know their customers better, studying their habits, tastes and needs so they can understand what product the customer wants or would like to buy (Dantas, 2013), this is called marketing. There are two types of marketing. The transaction marketing, which is directed to individual sales betting on product quality without worrying about the continuous contact between company-customer, and the relational marketing, which is concerned with the quality of production to meet customer needs in order to retain them, increasing the level of company-customer commitment in the long term (Grönroos, 1994). This study, therefore, focuses on relational marketing. This aspect of marketing presupposes the need for a long-term customer-market relationship. The aim of relational marketing is to bring companies and their customers closer by building relationships and, to do so, it is essential to understand their expectations, behaviour patterns, preferences and habits in order to create strong and lasting relationships with them (Simões, 2014). Ferrand et al. (2010), underline the importance of relational marketing in fitness centres for repurchase intention through service attributes. Therefore, customer retention is at the heart of relational marketing, the type of marketing that enhances customer relationships as a way to increase profit, generating benefits for both parties (Grönroos, 1994).

Thus, and in line with the above, understanding that customer satisfaction is related to future behavioural intentions with the company and that customer retention enables the company's profit to increase, highlights the approach to these two issues. Firstly customer satisfaction and secondly customer retention, since, as we will see below, one will probably lead to the other.



2.2. Customer satisfaction.

Customer satisfaction is considered the extent to which a product's performance is in accordance with customer expectations (Kotler & Armstrong, 2012). It is defined as a pleasurable fulfilment response toward a good, service, benefit, or reward (Oliver, 1997). Customer satisfaction has gained prominence among researchers and practitioners and in the marketing literature because of its importance as a key component of business strategy (Nikhashemi et al., 2013). Thus, achieving customer satisfaction should be a primary objective for most companies, particularly service companies that manage intangible and heterogeneous assets above all for two reasons. Firstly, because the customer's subjective judgement regarding satisfaction with services is one of the best criteria for evaluating them, customer satisfaction being related to service quality (Eskiler & Altunışık, 2021; Ferreira Barbosa et al., 2019; Pradeep et al., 2020; Rahmatulloh & Melinda, 2021; Zeithmal et al., 2011). Secondly because customer satisfaction increases the likelihood of retaining the customer (Bodet, 2006; Bolton, 1998; IHRSA, 2017; Nikhashemi et al., 2013; Oliver, 1999; Pradeep et al., 2020; Rahmatulloh & Melinda, 2021; Rust et al., 1995).

Specifically, in the context where the study was developed, the fitness context, satisfaction refers to customers' cumulative experiences with the fitness centre and its services (Li & Petrick, 2010). There are two distinct and interconnected approaches to assess satisfaction, the long-term perspective (overall satisfaction) and the short-term perspective (satisfaction by attributes) (Pedragosa, 2021a). In this study it is addressed overall satisfaction that can be defined as post-service representing buyers' overall feelings towards the service (Brown et al., 2016) based on their accumulated experiences with that service. In this sense, the member is satisfied when it understands, meets or exceeds their needs (Gerson, 1999). Expectations management is crucial because they have a positive, indifferent or negative impact on member satisfaction. Members' expectations are influenced by past experiences, personal needs, word of mouth, market communications, price and image (Pedragosa, 2021a).

Customer satisfaction is influenced by several factors such as special features on the product or service, perceived quality of the product or service, price (Zeithmal



et al., 2011) and perceived value (Ruiz et al., 2008; García-Fernández et al, 2017). The service quality is the most cited factor as an important influencer of customer satisfaction (Eskiler & Altunışık, 2021; Ferreira Barbosa et al., 2019; Pradeep et al., 2020; Rahmatulloh & Melinda, 2021; Zeithmal et al., 2011) and is an antecedent of both overall satisfaction and attribute satisfaction (Pedragosa, 2021a). Still, recent studies have verified the impact of other factors on customer satisfaction. For example, a recent study revealed the importance of fitness instructor attributes, namely social skills, in increasing customer satisfaction (Glaveli et al., 2021). In other words, customers tend to repurchase the service and spread the word (word of mouth behaviour) when they are satisfied with fitness centres because they have experienced positive affective and cognitive experiences. In addition, other recent study found that personal factors such as mood or emotional state and other situational factors such as the opinion of family members will also affect customer satisfaction (Rahmatulloh & Melinda, 2021). Furthermore, Nikhashemi et al. (2013) verified that the internet use also influences customer satisfaction.

Customer satisfaction is a direct factor determining customer loyalty which, in turn, is a central determinant of customer retention. There is a positive relationship between customer satisfaction and retention. When customers are satisfied with the product or service, they are more likely to make a purchase and are willing to spread the word by word of mouth (Hasan, 2013). Several studies provided empirical evidence that customer satisfaction is considered an essential variable for customer retention (Bodet, 2006; Bolton, 1998; IHRSA, 2017; Nikhashemi et al., 2013; Oliver, 1999; Pradeep et al., 2020; Rahmatulloh & Melinda, 2021; Rust et al., 1995). However, regular efforts should be made to improve service quality and customer satisfaction in order to maintain the retention rate. Each member's experience at the fitness centre should be consistently positive, purposeful, differentiated and valued. If this occurs, not only will the purchase renewal process be easier and more tempting, but also member satisfaction will increase, promoting recommendations (Hasan, 2013). An organization can only have success if it constantly satisfies its customers and expands its customer profile, retaining customers and attracting potential new ones to the organisation (Pradeep et al., 2020).



The flipside of satisfaction is member dissatisfaction, with the potential to decrease the fitness centre's membership if it has a volatile member base, damaging its reputation. This is particularly true in a service industry where member dissatisfaction is a significant problem. The action of members, and how managers react to such action, determine whether the member is retained by the fitness centre (Pedragosa, 2021a).

Concluding, it is extremely important that managers focus on the effects of customer satisfaction (Ferreira Barbosa, Loureiro, & Alves, 2019; García-Fernández et al., 2017; Gocłowska, Piątkowska, & Lenartowicz, 2019; Tsitskari, Quick, & Tsakiraki, 2014) and customer retention (Chris, 2011; Gonçalves & Diniz, 2015; Kim, 2019) as they call into question the stability of businesses, in terms of the continuity of members, but also the long-term sustainability of businesses (Zeithaml et al., 1996). Having said this, the study of services that can lead to member satisfaction, and in turn retention, proves to be fundamental.

2.3. Customer retention.

Customers are fundamental to any company, without them there is no revenue, profit, profitability or market value (Gupta & Zeithaml, 2006). Business relationships can logically vary in their intensity and have a positive impact on customer retention (Lin & Wu, 2011). However, customers will only establish a relationship with a provider when they experience a sense of identity and perceive value in the relationship (Nikhashemi et al., 2013).

Retention is understood as the tendency to repurchase, i.e., to renew the monthly fee to continue with the organisation (Bodet, 2012; Hallowell, 1996; Oliver, 1999). According to Oliver (1999), a customer with a history acquires a commitment to the company and tends not to look at other providers of the same service. It is important to clarify that retention is different from loyalty. In the short term, retained customers do not have to be loyal. Retention shows only a behaviour or a manifestation of loyalty, but not as an equivalent (Clavel San Emeterio et al., 2017; Oliver, 1999). Thus, retention is usually measured as a binary dependent variable (e.g. continue or cancel, retention or abandonment). Other authors have indicated



that customer retention can be measured through databases and company histories (Zins, 2001).

As for the context under study, the fitness industry, it's the rapid growth is due to a higher demand for these services, given the increased awareness of the benefits of physical activity. Customers now have access to a wide range of services, which increases their expectations of them and their intolerance towards some dissatisfaction, leading to early abandonment.

The concept of retention in fitness centres refers to membership retention and is considered fundamental to their profitability (Ferrand et al., 2010). The importance of customer retention for companies also lies in the fact that that the cost of attracting new customers is around five times higher than retaining existing ones (Lencastre & Brito, 2014; Simões, 2014), despite the fact that nowadays, the increase in competition and options, makes it difficult to keep customers (Pedragosa, 2012). Thus, fitness organisations have to understand the consumption behaviours of their members to achieve retention.

Among the variables that affect retention is satisfaction (Bodet, 2006; Bolton, 1998; IHRSA, 2017; Nikhashemi et al., 2013; Oliver, 1999; Pradeep et al., 2020; Rahmatulloh & Melinda, 2021; Rust et al., 1995). According to Pradeep (2021), service quality leads to customer satisfaction and both lead to customer retention. Other variables as age, returned payment receipts, money invested, time of registration, frequency and duration of stay should be considered to enhance customer retention. Yi et al. (2020), also points to age and frequency as a determining factor in retention.

A study on retention in fitness centres, also found that higher frequency of use was associated with a lower likelihood of abandonment and that the duration of stay in the fitness centre was related to lower the dropout probability, suggesting that managers should focus on offer services with durations of more than one hour (Clavel San Emeterio et al., 2017). Internet technology is also pointed out as an important tool in improving service, providing value to customers through which the retention rate and customer loyalty will be improved (Nikhashemi et al., 2013). Online proves to affect customer satisfaction, contributing to customer retention. Technology is part of customer perceived value, directly related to perceived quality



and therefore also to satisfaction and in turn to retention, as, as seen, customer satisfaction and service quality are both indirectly related to retention (García-Fernández et al., 2020). Another study referring to technologies on service delivery channels and customer retention, despite being in a European car manufacturer and roadside assistance service provider, indicates that customers are most likely to leave a service relationship when they only use one channel for service delivery, be it a technology-based self-service channel or a personal service channel, indicating the importance of offering multiple service delivery channels. This study also highlights the importance of the value that customers can get from different service channels over the duration of their relationship with an employee, as opposed to only using self-service channels, despite them being potentially more cost-effective for companies (Scherer et al., 2015).

There are several studies that address the issue of customer retention (Kim, 2019; Nikhashemi et al., 2013; Rahmatulloh & Melinda, 2021; Scherer et al., 2015). In the fitness context, retention has also been widely studied (Clavel San Emeterio et al., 2017; Ferreira Barbosa et al., 2019; Gonçalves et al., 2016; Gonçalves & Diniz, 2015; Yi et al., 2020), but there is a gap in this field, in the existence of studies that specifically address the impact of technologies on customer retention.

Based on the above, the desire arose to conduct this study, analysing the effect of technologies on customer retention in the fitness industry.

3. Fitness industry.

3.1. Fitness and business models.

Business model is understood as a conceptualization of the way a firm does its business (Zott et al., 2011). In the fitness industry, gyms can be classified by different business models through the services they offer and the pricing segment. With regard to business models through the services offered, they can fit into five categories: health clubs or fitness centres, personal trainer studios, crossfit boxes, women's gyms and fitness boutiques (Pedragosa, 2021b). The most complete business model is the health clubs and fitness centres. This business model offers various services from rooms with such as weight training equipment, cardiovascular equipment, group classes, functional training, swimming pool, racquet sports, ball



sports, sauna and spa & wellness. Regarding personal training studios, it is a business model that offers fewer services than the previous model and the facilities are smaller. The third business model, crossfit boxes, is similar to the second business model in its typology of service offerings and square metres. The fourth business model, women's gyms, offers more services compared to the second and third business model, such as bodybuilding equipment, cardiovascular equipment, group classes, functional training, swimming pool, sauna and spa & wellness but the facilities are smaller compared to the first business model. The last business model, fitness boutiques, offers similar services to the fourth business model and the facilities are also smaller compared to the first business model (Pedragosa, 2021b). In Portugal, most gyms (79%) are health clubs or fitness centres, followed by personal training studios (9%). Fitness boutiques have gained representativeness since 2018 and account for around 6% of business models in Portugal. Crossfit box business models and woman gyms are responsible for 5% of business models in the Portuguese fitness industry (Pedragosa, 2021b).

The business models, regarding the price segment, can be divided into three categories: low-cost, mid-market and premium. The average monthly fee prices for the low-cost segment are equal or less than 29.90 €, for the mid-market segment between 29.90 € and 55.00 €, for the premium segment above 55.00 € (EuropeActive, 2020). In Portugal, gyms have an average monthly fee of 37.71 € (with VAT), having decreased by 5.6% compared to 2018. It should be noted that 51% of gyms have average monthly fees in the mid-market segment and 42% in the low-cost segment. 66% of the individual gyms belong to the middle market segment and 50% of the chains belong to the low-cost segment. The main chains in Portugal are VivaGym Group (35 clubs), Holmes Place (21 clubs), Solinca (20 clubs), Fitness up (13 clubs), Kalorias (11 clubs), Pump (9 clubs) and the Time to Fitness 24H (7 clubs) (Pedragosa & Cardadeiro, 2019).

3.2. Physical activity and fitness industry.

During the last decades the numerous benefits of physical activity have been proven, its contribution to improving the quality of life and reducing/ combating health



problems derived from physical inactivity and sedentary lifestyles (WHO, 2020b). But despite the recommendations of the World Health Organization for physical activity, more than a quarter of the world's adult population (1.4 billion adults) is not active enough and around 1 in 3 women and 1 in 4 men do not get enough physical activity to stay healthy (WHO, 2020a). The lack of agreement on effective solutions, identification of responsibility and the role of different professional groups in addressing physical inactivity are the biggest current challenges (Loureiro & Ferreira Barbosa, 2018). However, over time, there has been an increased awareness of these benefits among the population. For this reason, in order to become more active, people have seen the need to go to specialised places where they can perform guided, monitored and controlled physical activity by health professionals. Thus, fitness centres have become fundamental places in the search for health (Gómez Hincapié et al., 2019). Due to this, there has been a boom in recent years in fitness centres and the large influx of people to them, which has managed to gain ground in terms of the practice of regular physical activity, where the characteristics, the service and the way in which the management is carried out with the user is what allows people to maintain these healthy practices in their daily (Díaz Sánchez, 2011).

In Portugal, most individuals who practice physical activity do so in fitness facilities. This industry plays a crucial role in reducing and combating the level of physical inactivity in this country, by allowing the regular practice of exercise in accredited spaces with specialized professionals (Pedragosa, 2021b). In September 2018, the *Associação de Ginásios e Academias de Portugal (AGAP)*, launched a movement to raise awareness of the importance of physical activity in the health of the population, the Movement PORTUGAL ATIVO. This movement assumes the importance of the fitness industry in promoting physical activity. In this line of action, there is scientific evidence that suggest that fitness professionals can improve their clients' health (Yorks et al., 2017; Zhou et al., 2019), through the promotion of physical activity, motivation and support for motion. In this context, exercise professionals become a valuable resource for public health and an essential component in the implementation of policies to reduce physical inactivity, since physical inactivity has been identified as the fourth leading risk factor for global mortality causing an estimated 3.2 million deaths worldwide (WHO, 2021).



3.3. Fitness industry evolution.

Sports practice has undergone great progress over time. The fitness industry emerged around the 1940s in the USA, in the form of street gyms and bodybuilding. The equipment used consisted of free weights and benches. In the 1960s, the first bodybuilding machines appeared, which offered greater safety for exercisers and in the 1970s, there was an explosion in the commercialisation of fitness, accompanied by a mass participation (Maguire, 2018).

The aerobic exercises were studied in the 1960s and 1970s by Dr Keneth Cooper, who proved their efficiency for losing weight and improving cardiovascular condition (Wing, 2014). Based on this knowledge, some training methods were developed in the USA which used music, dance steps and calisthenics exercises, among them the Aerobic Dance. In the 1980s, Arnold Schwarzenegger and Jane Fonda respectively boosted strength training and aerobics. Still in the 1980s, Gin Miller, for recovery and strengthening from a knee injury, used a step to perform exercises. The up and down turned out to be monotonous, however, when combined with music, the activity proved to be both fun and a great cardiovascular workout. For this reason, Gin Miller created the step aerobics group class (Dalleck, 2012).

Since the early 1990s, the term "aerobics" has been steadily replaced by the term "group class" due to the emergence of new formats, which do not include the cardiovascular component. In the 1990s, in the USA, a new type of fitness services emerged: personal training (Maguire, 2008). The large-scale growth of aerobics and the increasing body care trend made personal training more accessible to the middle class. Also in the 1990s, the arrival of Les Mills' pre-choreographed group classes, starting with Body Pump, were also a major contribution to the industry's evolution. According to Wagener et al. (2020), the emergence of Crossfit by Greg Glassman in 1996 also revolutionised the industry. Figure 7 shows some of the key moments that have revolutionised the fitness industry since the early days. The 1990s were characterised by the international explosion of the fitness industry and, in addition to the United States, England, Germany, France, South Africa and Japan saw the expansion of this industry. At the same time, the emergence of various institutions and organisations linked to fitness, such as the Health & Fitness Association (IDEA), American Fitness & Aerobics Association (AFAA), American Council on Exercise



(ACE), American College of Sports Medicine (ACSM), International Health, Racquet & Sportclub Association (IHRSA), NASM (National Academy of Sports Medicine), the european organisation Europeactive as well as the Portuguese organisation Portugal Activo | AGAP, contributed to the credibility and affirmation of these activities.

After overcoming a crisis in 2008 (technological period), the fitness industry started to offer more than the traditional gyms, doing by innovating new products and services: different business models; new price segment; and high technology (Pedragosa, 2021b). The concept itself has been developing from fitness to wellness (Pedragosa, 2012), concept created by Charles Corbin. The wellness concept is defined as the union of health and fitness aspects, without neglecting physical condition, and valuing quality of life and well-being (Saba, 2006).

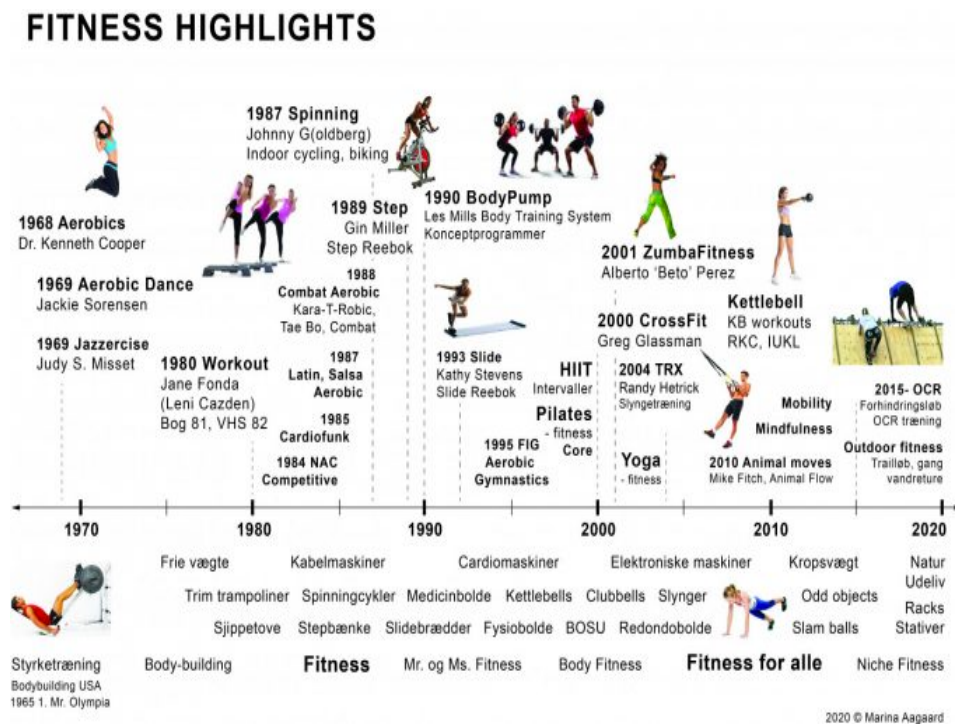
The fitness industry is constantly growing. In 2019, globally, the number of health club members exceeded 184 million members. Industry revenues totalled an estimated 97 billion dollars in the same year, with 210,000 facilities. Major markets continued to show growth in the Americas and Europe. Before the pandemic, the number of health club customers had grown by 27%, since 2010 (IHRSA, 2020). The European health and fitness market also grew in 2019. The total number of health and fitness club members increased by 3.8% (2.4 million new members) to almost 65 million, highlighting fitness as the number one sporting activity in Europe. Total revenues of fitness clubs also increased by 3.1% (€28.2 billion). The number of facilities increased by 2.3% (63,644). Germany proved to be the country with the highest number of members ahead of the UK (10.4 million), France (6.2 million), Italy (5.5 million) and Spain (5.5 million) (EuropeActive, 2020). In Portugal, in 2019, there were 1100 fitness centres, 688,210 members, mostly women (57%). The overall market represented €289,371 million (excluding VAT) (Pedragosa & Cardadeiro, 2020). The first chain in Portugal was Holmes Place in 1998 and after this milestone other gyms and individual chains appeared in Portugal. The number of chains in Portugal has been increasing since 2016 when compared to individual gyms. Chains represented in 2019, 63% of gyms and in 2018, 47% of gyms (Pedragosa & Cardadeiro, 2019).



With regard to the evolution of research on this area, a recent study (Miragaia & Constantino, 2019) reveals that research on gyms and health clubs began to grow in 2001, with most publications being developed in the last 15 years. The first specific journal in sport management, the Journal of Sport Management, contributed the most to this development of the literature.

Figure 7

Fitness industry evolution (Aagaard, 2015)



3.4. Global fitness trends.

Knowledge of market trends can help to discover or create opportunities to start, manage or expand businesses in any business environment (Sánchez-Oliver et al., 2017). The fitness industry is no exception. In the fitness market it is important to follow international trends (Kercher et al., 2021). The study and interpretation of the trends can be very useful for the entrepreneur in physical activity and sports



science in the search for business opportunities. Thus, from 2006 to the present, the American College of Sport and Medicine's (ACSM) Health & Fitness Journal sends an annual electronic survey to thousands of professionals around the world to determine trends related to physical activity and sport in the coming year. That is, every year the ACSM publishes a worldwide fitness trend survey for the following year. The goals of this survey are to differentiate a temporary fad from a trend, to establish global trends in the physical activity and sport-related industry from the clinical (including fitness), commercial, business and physical activity and sport-related community and to learn expert opinion for the coming year. The survey is sent annually to 20-25,000 professionals and includes 40-45 trends of which 25 are major trends from previous years and the rest are some emerging trends identified by the editors of the ACSM Health & Fitness Journal (Sanchez-Oliver et al., 2017).

According to the same author, even the future of any industry cannot be accurately predicted, this survey helps track trends that can assist owners, managers, programme directors and personal trainers in making important business decisions that have a direct bearing on the enterprise. It is also important for the fitness and sports-related industry to pay close attention to trends that appear for the first time but also to those that do not appear in successive years.

Figure 8 presents the top 10 global fitness trends of the last three years (Thompson, 2018, 2019, 2021). The covid-19 pandemic has had an effect on 2021 fitness trends. It brought the reality of online training and virtual training. As of the 2020 survey, virtual/online training was redefined specifically for online training, and reached the top of the global fitness trends.



Figure 8

Global fitness trends in the past three years based on Thompson (2018, 2019, 2021) (of own elaboration)

Ranking	1	Wearable Technology	Wearable Technology	Online Training
	2	Group Training	High Intensity Interval Training	Wearable Technology
	3	High Intensity Interval Training	Group Training	Body Weight Training
	4	Fitness Programs for Older Adults	Training with Free Weights	Outdoor Activities
	5	Body Weight Training	Personal Training	High Intensity Interval Training
	6	Employing Certified Fitness Professionals	Exercise is Medicine	Virtual Training
	7	Yoga	Body Weight Training	Exercise is Medicine
	8	Personal Training	Fitness Programs for Older Adults	Strength Training with Free Weights
	9	Functional Fitness Training	Health/ Wellness Coaching	Fitness Programs for Older Adults
	10	Exercise is Medicine	Employing Certified Fitness Professionals	Personal Training
		2019	2020	2021

3.5. Fitness industry's response to covid-19.

During the course of this study, a global pandemic, covid-19, hit us and severely affected all industries, including the fitness industry. In this sense, it was decided to address the influence that the pandemic had on the industry in question, for a better, real and updated description of it.

The worldwide pandemic of covid-19 changed everything and led to fitness centres having to adapt to these changes and restructure their services (Thompson, 2021). The pandemic has produced effects for the global health and fitness industry, among them a significant economic impact (Kercher et al., 2021). Fitness centres faced substantial financial burdens and subsequent restrictions. Mandated closures placed financial pressure on owners, causing many gyms and fitness centres to close permanently (Myers et al., 2020).

The impact on the industry included 1.4 million jobs lost until December 2020, 20.4 billion dollars in lost revenue, 17% of fitness clubs and studios closed in the same period and one in four clubs are projected to close suddenly (IHRSA, 2021). In Portugal the effects of the pandemic were also felt in the industry. The number of fitness centres decreased by 30% to 800 and the number of members decreased by 29% (491,355 members), mostly women (56%). Overall market revenues decreased by 42% with €167,408 million (excluding VAT) (Pedragosa & Cardadeiro, 2021).



Despite the negative impact of the pandemic in several aspects, it has raised health awareness. In order to deal with the repercussions of the virus, during the lockdowns most people started exercising at home for the first time (Rizzo, 2021), which led to an increase on fitness equipment sales (IHRSA, 2021; Myers et al., 2020).

Fitness centres immediately began following a framework for managing the risks associated with covid-19 in their facilities and made the Active & Safe Commitment developed by industry experts in accordance with key public health guidelines. Gyms and fitness centres implemented creative solutions to meet the challenges of social distancing and increased sanitary requirements, such as cleaning equipment between participant use (Myers et al., 2020). A recent study found that there was no statistically significant association between covid-19 test scores and going to a fitness centre (IHRSA, 2021). The same study shows that people are more trustful about their fitness centre's safety protocols than other businesses.

The recovery following covid-19 is proving daunting for the industry. As fitness centres have begun to reopen, membership rates have declined, continuing to put financial pressure on managers (Myers et al., 2020). However, a report based on an analysis of fitness companies in the US, UK, Ireland, Australia, Singapore, Hong Kong and Malaysia indicates that boutique, fitness centre attendance and class bookings have returned to around 91% of pre-covid levels. Data from this report even indicates that some boutique businesses in the UK and Australia now have higher levels of occupancy than before covid-19. Only in the US online classes have lower adoption than in all other countries surveyed. This report indicates that people continue to turn to virtual fitness classes, suggesting that fitness centres should maintain a hybrid model as they seek revenue streams (Curley, 2020). The IHRSA media report from 2021 suggests that health club membership and usage trends in 2020 indicated sustainable long-term growth and strong growth also in fitness demand, before and during pandemic induced lockdowns (IHRSA, 2021).

From a technological perspective, lockdowns and norms of social distancing have led to a transition in the fitness centres from face-to-face classes to virtual classes (IHRSA, 2021; Myers et al., 2020). Studios and fitness centres have



increased their online presence, their availability of on-demand resources such as virtual classes (Grand View Research, 2021). Not only virtual classes but also the use of mobile fitness apps has increased. By the year 2020 the number of users of fitness apps has increased 46% (Grand View Research, 2021; Rizzo, 2021). During the quarantine 74% of Americans used at least one fitness app (Rizzo, 2021).

The use of technology was already a reality in the fitness industry. However, the pandemic has further highlighted the importance of their use. As we have seen, the strategies created by fitness centres to continue their work was, explicitly, done through technologies, for example through virtual classes. Also customers started to use more fitness apps, on-demand and wearable fitness technologies (WFT). Concepts that will be defined below.

3.6. Technologies in the fitness industry.

Although technologies are already a very present reality in the fitness industry, the pandemic and the fact that the industry had to adapt to providing remote workouts (through social networks, WFT, on-demand, apps) has further highlighted their importance but also the importance of this work. In this work, the use of technologies in fitness centres is addressed through the three studies. The first study served precisely to understand the adoption of technologies and social networks in fitness centres. In the second and third studies it is addressed, in particular, the fitness centre apps. Thus, a broader approach to the use of technologies in fitness centres was considered relevant.

The main technologies used in fitness centres are related to technological equipment, applications (apps to facilitate facility management and group classes) and virtual classes in fitness centres. The current pandemic crisis has highlighted the importance of using technologies to meet expectations and increase customer satisfaction (Pedragosa, 2021b). Fitness centres started to offer virtual classes at home (through the internet, social networks, for example), wearable fitness technologies (WFT) (Polar, Apple Watch, Fitbit Activity Trackers, Myzone), and on-demand (Les Mills on demand, fitness centre apps).



With regard to social networks, their use continues to grow and social networking sites are now estimated to have 3.6 billion users (Tankovska, 2021). According to Tankovska (2021), facebook was the first social network to beat one billion registered accounts and have now more than 2.74 billion monthly active users. Particularly in sports organisations, managers are now especially conscious of the benefits of social networks as a tool for implementing their marketing strategies (Filo, Lock and Karg, 2015). With the covid-19 pandemic situation, fitness centres have turned to social networks, particularly Facebook, to continue their work, specifically group classes. This need for the industry to adapt quickly from face-to-face training to distance training was one of the reasons that may have led to the rise of online training to the top of the table of global fitness trends (Thompson, 2021).

WFT such as Polar, Apple Watch, Fitbit Activity Trackers, Myzone, are electronic devices that can be used as accessories for practical fitness uses such as: monitoring physical activity, counting steps taken, counting calories, training intensity, among other uses (Lunney et al., 2016), in order to provide feedback on users' physical activity. By integrating WFT, health and fitness clubs can develop strategies to improve their members' service experience and achieve their business objectives (Baker et al., 2017; Pizzo et al., 2020). WFT enhance the service experience through increased social interaction, gamification, and accountability. Thus, by using WFT fitness clubs enable members to meet their personal fitness needs (Pizzo et al., 2020). The growing number of WFT users presents a strong opportunity for health and fitness organisations to leverage WFT integration to engage members and differentiate themselves from competitors by increasing key fitness industry performance measures such as member satisfaction and retention (García et al., 2018). The first WFT devices date back to 1982, when the first wireless heart rate monitor, Polar, was released. In 2015, an innovative product emerges, the AppleWatch. This tool merges features typically associated with watches with technological functions linked to the owner's iPhone (text messages and remote access to the phone, notifications) to fitness, sports and physical activity features (Pizzo et al., 2020). Another innovative system from WFT is Myzone. Myzone is based on wearable heart rate that uses wireless and cloud technology to accurately and conveniently monitor physical activity (MYZONE, 2020). This WFT was



perceived to enhance gym experiences through fostering, social interaction, gamification and accountability. It is used by managers to increase social interactions with club members both within and outside the fitness facility (Pizzo et al., 2020).

On-demand offers various online fitness services from home (Pedragosa, 2021b). One of the providers of the on-demand technology is Les Mills International, based in New Zealand. Les Mills International has started to make their on-demand classes available through streaming services (Andersson & Andreasson, 2021) with an associated cost. Some fitness centre apps, such as, for example, Portuguese Regibox, also make it possible provide recorded classes, and very importantly, with the instructors that members are used to and at no associated cost, other than the monthly fee to belong to the fitness centre. However, the literature on this subject is still scarce.

The use of smartphone is also exponentially growing. According to the Mobile Economy Survey 2018, the smartphone penetration rate is estimated to grow from 57% in 2017 to 77% by 2025 (Grand View Research, 2021). This growth leads to an increase in the use of complementary information technology and content, such as mobile applications (Nielsen, 2014). Apps refer to software developed for electronic devices such as smartphones, tablets, or watches that can be described in Apps for fitness facility management (Ferreira Barbosa & Pedragosa, 2021). The transition from the fitness centres to the virtual fitness with the covid-19 pandemic also highlighted the use of these apps, which increased 46% in 2020 (Grand View Research, 2021; Rizzo, 2021). This increased usage rate of fitness apps due to a growing trend of online fitness training is driving the market globally. As seen above, the ACSM Worldwide Survey of Fitness Trends for 2021 indicates that the mobile exercise apps are proving to be a growing trend in the fitness world, reaching 12th in 2021 global trends (Thompson, 2021). Within fitness apps there are fitness apps that provide exercises, allow users to set goals, track activity and share progress on social networks and there are fitness centre management apps, related to the facilities (e.g. booking classes, purchasing services, etc.). Fitness apps are increasingly used whether at home, in fitness centres, on holiday, to motivate exercise behaviour change (Oyibo & Vassileva, 2019). These apps are usually



equipped with a number of persuasive features to motivate and facilitate the desired behaviour change. Some of the persuasive features commonly used in fitness apps in the current market include goal setting, self-monitoring, reward, social learning, social comparison, competition and cooperation. Research has shown that these persuasive features lead to behaviour change in a personal and social context (Oyibo & Vassileva, 2019). Several studies on the use of health and fitness apps have identified various individual health benefits (Sullivan & Lachman, 2017; Wharton et al., 2014) but fitness apps are also related to positive changes in individuals' attitudes, beliefs, perceptions and motivation towards physical activity (Hoj et al., 2017).

Specifically, the fitness centre apps are generally integrated into the management software they use (King, 2018). These apps prove to be a convenient and easily accessible tool that allows fitness centres to remain constantly connected to their members, motivate them (Feld, 2018) and can contribute to increasing users' adherence to exercise and social involvement (Hu & He, 2020). The fitness centre app makes it easy for members to purchase their products, whether it's classes, special programs, personal training, or massages. Using the app customers can also check on the fitness centre schedule, ask questions, report problems and give feedback on, for example, employee performance (Feld, 2018). These apps can help improve members' experience and can also increase revenue and referrals by reducing operating costs (King, 2018). Among other advantages of using this type of apps is, for example, the member's mobile check-in with the QR code function, which facilitates and minimizes the number of member cards to be printed or purchased and frees up team time from reception. By automating other processes, notifications and communications through the app cost less than sending messages and can significantly reduce the cost of printing marketing materials such as invitations for potential members, class schedules. By using the fitness centre app, members tend to stay engaged for longer, increasing retention (Ferreira Barbosa & Pedragosa, 2021). Through some apps, fitness centres can also award prizes or points to members for using the app, for example for the workouts they complete, the achievement of targets or the feedback provided, which can then be exchanged for products or services. Figure 9 summarises the main characteristics of the fitness



centre applications. All these aspects help to make better business decisions, to offer products and services with greater precision. Fitness centre apps also end up acting as a digital employee, an employee who never misses work, never takes a break or calls in sick (Ferreira Barbosa & Pedragosa, 2021). In Portugal, the apps most used by Portuguese fitness centres are Regybox, OnVirtualGym, Trainingym and myHut (fitness centre's own application) (Ferreira Barbosa & Pedragosa, 2021).

The significant increase in the quantity of technological innovation tools (e.g. virtual classes, applications) are fundamental to create a more favourable relationship between the customer and the organisation (Pedragosa, 2021b). However, there are few studies developed explicitly on this field, suggesting that this topic should be further developed by the scientific community, particularly in competitive markets such as fitness centres and health clubs (Miragaia & Constantino, 2019).

Figure 9

Features of the fitness centre apps (of own elaboration)

Features of fitness centres apps	Check in at the fitness centre.
	Check information about the fitness centre, such as opening hours.
	Facilitate the booking of group classes and the purchase of services.
	Reduce costs by printing marketing materials.
	Organising and evaluating challenges.



Chapter III: Methodology

This chapter will seek to explain the research methodology by describing the study design, describing the procedures used in the three studies conducted, presenting the study sample and presenting the instrument used.

1. Methodology

1.1. Study design, procedure and time planification.

In order to understand the line of thought of the present study, the general scheme of the research was elaborated (Table 2). The design of each study will be described below.

Table 2

Study design

The use of fitness centre apps on customer satisfaction and retention: The fitness centres context	
Main objective	
Analyse the use of fitness centre apps and its influence on customer satisfaction and retention.	
Article 1: Systematic Review "The influence of technologies on members' retention by gyms: A systematic review"	
Objective: Identifying the influence of social networks and technologies on customer retention in fitness centres.	
Articles 2 and 3	
Article 2: "The use of fitness centre apps and its relation to customer satisfaction: A UTAUT2 perspective"	Article 3: "Adoption of the fitness centre app on customer satisfaction: A multigroup analysis"
Objective: Analyse the intention to use fitness centre apps and their relationship with overall customer satisfaction.	Objective: Analyse whether there are significant differences in the use of fitness centre apps, and also in customer overall satisfaction, in relation to age, gender, academic qualifications, training frequency and registration time.
Measurement Instrument	
Questionnaire	
<ul style="list-style-type: none"> - Socio-demographic and fitness centre use items; - 28 UTAUT2 model items; - 1 item to assess use behaviour; - 4 Customer satisfaction items. 	
Sample (n=1,678)	
Female ♀ = 982 (59%)	Male ♂ = 696 (41%)
Article 2:	
To assess the measurement (outer) model in (first stage):	

(Continued on next page)



- Measures of internal consistency reliability: rhoA, Cronbach's alpha measures and composite reliability;
 - Unidimensionality and convergent validity: The AVE (average variance extracted);
 - Discriminant validity: heterotrait–monotrait ratio of correlations (HTMT) and Fornell and Larcker's criteria.
- To evaluate the structural (inner) model (second stage):
- R² and path coefficients;
 - Bootstrap percentile Cis to check the significance of the path coefficients.

Article 3:

Testing the measurement invariance of composite models:

- Measurement of composite models (MICOM);

Multigroup analysis:

- Permutation and the path coefficients for comparison of each group.

The following are the key phases that led to the completion of this dissertation with the time planning.

First, in October 2019, to answer the first objective, identifying the influence of social networks and technologies on customer retention in fitness centres, the first article was started, "The influence of technologies on members' retention by gyms: A systematic review". The translation of the title of this article, originally prepared in Portuguese, indicates that gyms were studied, however, the study refers to fitness centres. As previously mentioned, the difference between gyms and fitness centres is that fitness centres incorporate more services since from rooms with such as weight training equipment, cardiovascular equipment, group classes, functional training, swimming pool, racquet sports, ball sports, sauna and spa & wellness.

This first article started with a search of the existing literature on the topic under study that was conducted in several databases (Web of Science, Scopus, EBSCO and PubMed) with the terms 1) "retention" (fidelity, loyalty, adherence), 2) "health fitness club" (fitness centre, health club, gymnasium), 3) "technology" (social networks, mobile phone, smartphone, app, Facebook, twitter, Instagram, gamification). Through the PRISMA method (Moher et al., 2009) 10 articles were selected. The results showed that social networks and the use of technologies are fundamental in the retention process. After analysing the 10 articles, it was also identified and analysed the variables personal characteristics of members, frequency and time of use, quality of service and satisfaction, as influencing customer retention. In summary, this study reviewed the articles that study the impact of technologies and social networks on customer retention in fitness centres



and helped to identify other factors that focus on customer retention, grouping them into two dimensions, associated with the company and the customer.

The results of the first study led to the second study, also in order to answer the second objective, analyse the intention to use fitness centre apps and their relationship with overall customer satisfaction. Thus, in February 2020, the second article "The use of fitness centre apps and its relation to customer satisfaction: A UTAUT2 perspective" was prepared and the instrument for data collection was developed. The data collection process, which was supported by AGAP, took place from July to September 2020, through the application of the questionnaire in online format inserted into the Google Forms application, whose completion time was, on average, 10 minutes. The information provided by the members was voluntary and confidentiality was guaranteed. These data served as the basis for the remaining articles and conference presentations that are part of this work. This study used the extended unified theory of acceptance and use of technology (UTAUT2) (Venkatesh et al., 2012), 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 1,678 fitness customers from Portugal. The results support the ability of UTAUT2 in predicting the customers intention to use the fitness centre app. All UTAUT2 constructs, namely, performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation and habit (Venkatesh et al., 2012) showed a positive impact on behavioural intentions to use the fitness centre app. Performance expectancy and habit have the strongest relationships. With this study it was also concluded that behavioural intentions are positively related both to the use behaviour of the fitness centre app and to overall customer satisfaction. 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. This study is paramount as regards to examine the behavioural intention to use the fitness apps that the fitness centres using UTAUT2 model.

In February 2021, with the findings of the second study on the influence of control variables on use behaviour and customer overall satisfaction, a third article was initiated, "Adoption of the fitness centre app on customer satisfaction: A



multigroup analysis”. This paper aims to analyse whether the influence of behavioural intention to use the fitness centre app in the use behaviour and in customer overall satisfaction varies according to gender, age, academic qualifications and registration time. To investigate this heterogeneity, a multi-group analysis (MGA) was used through partial least square structural equation modelling (PLS-SEM). The sample included was the same used in the previous study. The results showed that the influence of behavioural intentions on overall customer satisfaction and use behaviour varies according to the customers’ socio-demographic characteristics and time of registration. The findings also revealed that the influence of behavioural intentions on both overall customer satisfaction and use behaviour is greater in men, in the youngest customers, those with lower academic qualifications and registered for less time at the fitness centre.

Finally, a general discussion of the work was held. The project timeline of this research, as well as the entire chronology of the PhD. process can be seen in Appendix A. In the planning it is also possible to verify all the work developed within the doctoral thesis, participation and work developed in conferences based on the articles developed, book chapters that were held, courses attended within the PhD.

1.2. Data collection.

The data was collected between July and September 2020. The sample included 1,678 customers of Portuguese fitness centres. Portugal presents a good context for this research as there is a great development of the use of fitness centre apps. According to the Fitness Barometer 2021, around 68% of fitness centres use these apps (Pedragosa & Cardadeiro, 2021).

For data collection, the collaboration of the *Associação de Ginásios e Academias de Portugal* (AGAP) was requested. The AGAP was immediately interested in our study and requested the presentation of the basis and objectives of the study. After it was sent and subsequently approved by the President of the association, in July 2020, AGAP contacted the fitness centres to present the study, send the questionnaire and request that it be re-sent to the members. In order to get an even more representative sample of the Portuguese population, Dr. Vera



Pedragosa, fitness industry researcher from the Psychology Research Centre and the Autonomous University of Lisbon, was also contacted. Through Dr. Vera's knowledge base of fitness centres in Portugal, it was possible to increase the final sample size considerably.

With regard to the data collected, female members (59%, $n = 982$) were higher than male members (41%; $n = 696$), which coincides with the percentages of men and women in Portugal (Pedragosa & Cardadeiro, 2021). The age range that most responded to the questionnaire was 25-34 years (29%; $n = 491$) and 35-44 years (29%; $n = 486$). With respect to academic qualifications, it was found that 66% ($n = 1101$) of the members had a higher education. The districts in the country where more answers were received were Lisbon (54%; $n = 903$), Porto (14%; $n = 236$), Setúbal (9%; $n = 145$) and Beja (7%; $n = 122$). The distribution of the answers to the questionnaire per district coincides with the distribution of the population of Portugal. Around 34% ($n = 576$) of the respondents declared that they attend the fitness centre on average more than five times per week. It was also found that 32% have been registered at the fitness centre for more than four years and another 32% stated that they have been registered between two and three years. The majority of members (84%; $n = 1,403$) reported using the fitness app, which were those included in the final sample. The descriptive analysis can be seen in Table 3.

Table 3
Descriptive analysis

	n (%)
Gender	
Female	982 (59)
Male	696 (41)
Age (years)	
Less than 25	208 (12.4)
25 - 34	491 (29)
35 - 44	486 (29)
45 - 54	356 (21.3)
More than 55	135 (8.1)
Academic qualifications	
Basic Education	49 (2.9)
Secondary Education	526 (31.4)
High Education	1,101 (66.0)
District of residence	
Lisboa	903 (54)

(Continued on next page)



Porto	236 (14)
Setúbal	145 (9)
Beja	122 (7)
Leiria	101 (6)
Braga	49 (2.9)
Coimbra	49 (2.9)
Aveiro	38 (2.3)
Viseu	22 (1.3)
Évora	2 (0.1)
Santarém	2 (0.1)
Portalegre	1 (0.1)
Madeira	1 (0.1)
Attendance to the fitness centre	
0 times per week	61 (3.6)
Once a week	81 (4.8)
Twice a week	221 (13.2)
Three times per week	243 (14.5)
Four times per week	277 (16.5)
Five times per week	217 (12.9)
More than five times	576 (34.4)
Time of Registration	
Less than 6 months	275 (16.4)
6 months to 1 year	318 (19)
2 to 3 years	541 (32.3)
More than 4 years	542 (32.3)
Use the app	
Yes	1,403 (83.7)
No	273 (16.3)

1.3. Measurement instrument.

Data collection in an investigation usually appears associated with the model used. The instrument selected for this study, according to the quantitative methodology was the questionnaire. The questionnaire was applied online, through google forms.

1.3.1. Questionnaire.

In accordance with the proposed objectives, the UTAUT2 model was selected, once this model have greater predictive power compared to other technology adoption models and is more suitable for the study of technology adoption from the



customer's perspective. Therefore, the UTAUT2 model served as the basis for the completion of the questionnaire (Appendix B).

The questionnaire is composed of 33 items, of these, 28 come from each of the UTAUT2 constructs, performance expectancy, effort expectancy, social influence, facilitating conditions (Venkatesh et al., 2003), hedonic motivation and habit (Venkatesh et al., 2012). The UTAUT2 construct price value was not added since the app is made available free of charge to members. Also based on the UTAUT2 model, an item was added to assess use behaviour (based on Zeithaml et al. (1996), adapted by Venkatesh et al. (2012) and 4 items to assess customer overall satisfaction with the fitness centre, based on Oliver (1997) and Cronin et al. (2000), adapted to fitness industry by García-Fernández et al. (2017).

Thus, the questionnaire includes four items associated to the performance expectancy variable (i.e., I find the mobile application of my gym useful), four items associated to the effort expectancy (i.e., Learning to use my gym's mobile application is easy), five items associated to the social influence (i.e., People who are important to me think I should use the gym's mobile application), four items associated to the facilitating conditions (i.e., I have the resources necessary to use the gym's mobile application), three items to the hedonic motivation (i.e., Using the gym mobile application is fun), four items 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 item associated to the use (I use the application frequently). As mentioned before, the variable price value was excluded since the fitness app to be studied are made available to members without any extra value. Also, four items were also added to the questionnaire to measure customer overall satisfaction. All items are measured on a 5-Likert scale of five points where 1 expresses maximum disagreement and 5 expresses total agreement.

Finally, the questionnaire includes questions of a socio-demographic nature and characterization 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 and endogeneity.

1.4. Data analysis.

The first study, the systematic review titled “The influence of technologies on members’ retention by gyms: A systematic review” was developed following the structure and recommendation of other systematic reviews (Castro-Pinero et al., 2010; Ruiz-Ariza et al., 2017; Zanatta et al., 2018) and the treatment used by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines for reports and studies. The PRISMA recommendation is defined as a set of evidence-based items for conducting systematic reviews and meta-analyses. It consists of a checklist and a flow chart. PRISMA is composed of a 27-item checklist, which helps the author to make sure that he/she has analysed all aspects of the systematic review. It also includes a flow chart with the total number of references found, the number of articles that were excluded in the various phases and the number of articles that reached the final phase. The purpose of PRISMA is to help authors to improve the reporting of systematic reviews and meta-analyses (Moher et al., 2009).

In order to analyse de data from second study, titled “The use of fitness centre apps and its relation to customer satisfaction: A UTAUT2 perspective”, it was used SmartPLS 3.3.2 software (Ringle et al., 2015). This software is specialized 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 et al. (2019) this 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 ratio of correlations (HTMT) 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. R² and path coefficients are the most important result of the structural model (García, Martelo-Landroque, et al., 2018). The bootstrap percentile CIs was used to check the significance of the path coefficients (García, Martelo-Landroque, et al., 2018).

For the third study, titled “Adoption of the fitness centre app on customer satisfaction: A multigroup analysis” the same software was used. The measurement invariance of the composite models was tested through the three-step composite model measurement (MICOM) (Henseler et al., 2016). The MICOM procedure consists of three steps: (1) configurational invariance (2) compositional invariance and (3) equality of mean values and composite variance values. According to Hair et al. (2018) to apply the MGA it is necessary to establish both configurational invariance and compositional invariance to establish partial measurement invariance. To establish configurational invariance each latent variable in the PLS-SEM model must be specified equally for all groups, ensuring, in this case, identical indicators for each measurement model, identical data treatment and identical algorithm configuration across all groups. Subsequently, for the multi-group analysis, permutation was used and path coefficients for each variables relationship were compared. For this study, the control variables age, academic qualifications and time of registration were regrouped and only two groups were created for each. Age was regrouped into participants aged under 25 years to 34 years (n=569) and participants aged 35 years to over 55 years (n = 834). For the academic qualifications variable



the groups of basic and secondary education were grouped (n=464) and the group with higher education qualifications was maintained (n = 939). As for the time of registration, the groups of participants were grouped by those who were registered between less than six months and one year (n=494) and those registered between two years and more than four years (n = 909).

The three scientific publications are discussed in the chapters that follow (Chapters IV, V, and VI). The first published article is in Chapter IV, the second published article is in Chapter V and the final article produced is in Chapter VI, which has not yet been submitted to any journal. Finally, in Chapter VII, an overall conclusion of the work will be presented, including the study's practical and theoretical implications and limitations, as well as future research proposals. The dissertation references, as well as the appendix, project timeline, and measuring instrument, are listed at the end of the report.

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Chapter IV: Article 1

INFLUÊNCIA DAS TECNOLOGIAS NA RETENÇÃO DE SÓCIOS EM GINÁSIOS: REVISÃO SISTEMÁTICA

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INFLUÊNCIA DAS TECNOLOGIAS E OUTRAS VARIÁVEIS NA RETENÇÃO DE SÓCIOS EM GINÁSIOS: REVISÃO SISTEMÁTICA

THE INFLUENCE OF TECHNOLOGIES AND OTHER VARIABLES ON THE RETENTION OF MEMBERS IN GYMS: SYSTEMATIC REVIEW

LA INFLUENCIA LAS TECNOLOGÍAS Y OTRAS VARIABLES EN LA RETENCIÓN DE LOS MIEMBROS EN GIMNASIOS: REVISIÓN SISTEMÁTICA

Resumo: O objetivo desta revisão sistemática é identificar a influência das redes sociais e tecnologias na retenção de clientes em ginásios. A pesquisa foi efetuada em quatro bases de dados online, de 2011 a 2019. Através do método PRISMA (MOHER *et al.*, 2009), foram selecionados 10 artigos. Os resultados evidenciaram que as redes sociais e o uso de tecnologias são fundamentais no processo de retenção. Após a análise dos 10 artigos, foram também identificadas e analisadas as variáveis características pessoais dos sócios, frequência e tempo de utilização e qualidade do serviço e satisfação, como influenciadoras da retenção de clientes. Resumindo, este estudo fez uma revisão dos artigos que estudam o impacto das tecnologias e redes sociais na retenção de clientes em ginásios e ajudou a identificar outros fatores que incidem na retenção clientes, agrupando-os em duas dimensões, associadas à empresa e ao cliente.

Palavras-chave: Redes Sociais. Tecnologias. Retenção. Revisão Sistemática.

Abstract: The objective of this systematic review is to identify the influence of social networks and technologies on customer retention in fitness centers. The survey was conducted in four online databases, from 2011 to 2019. Through the PRISMA (MOHER *et al.*, 2009) method, 10 articles were selected. The results showed that social networks and the use of technologies are fundamental in the retention process. After analyzing the 10 articles, we also identified and analyzed the variables personal characteristics of members, frequency and time of use, quality of service and satisfaction, as influencing customer retention. In summary, this study reviewed



the articles that study the impact of technologies and social networks on customer retention in gyms and helped to identify other factors that focus on customer retention, grouping them into two dimensions, associated with the company and the customer.

Keywords: Social Networks. Technologies. Retention. Systematic Review.

Resumen: El objetivo de esta revisión sistemática es identificar la influencia de las redes sociales y las tecnologías para la retención de clientes en gimnasios. La encuesta se llevó a cabo en cuatro bases de datos, de 2011 a 2019. A través del método PRISMA (MOHER *et al.*, 2009), se seleccionaron 10 artículos. Los resultados mostraron que las redes sociales y el uso de tecnologías son fundamentales para la retención. Después de analizar los 10 artículos, también identificamos y analizamos las variables características personales de los miembros, frecuencia y tiempo de uso, calidad de servicio y satisfacción, como influyentes en la retención de clientes. En resumen, este estudio revisó los artículos que estudian el impacto de las tecnologías y las redes sociales en la retención de clientes en los gimnasios y ayudó a identificar otros factores que se centran en la retención de clientes, agrupándolos en dos dimensiones, empresa y cliente.

Palabras clave: Redes Sociales. Tecnologías. Retención. Revisión Sistemática



1 INTRODUÇÃO

O conceito de retenção em ginásios refere-se à retenção de sócios e é considerado fundamental para a sua rentabilidade (FERRAND; ROBINSON; VALETTE-FLORENCE, 2010). De acordo com Pedragosa (2012) existem vários sinónimos de retenção na literatura, tais como fidelização ou lealdade. A retenção é entendida como a tendência de recompra do produto, ou seja, de renovar a mensalidade para continuar como sócio do ginásio (BODET, 2012; HALLOWELL, 1996; OLIVER, 1999).

Um problema com que os gestores dos ginásios se deparam diariamente é a retenção dos seus sócios. Para Talley (2008), não existe uma solução simples para resolver este problema, mas existem várias estratégias e processos que se podem adotar. Revela-se, então, de extrema importância compreender as variáveis que afetam o comportamento de retenção.

A internet, as tecnologias móveis, os *big data* e outros fenómenos tecnológicos estão a causar mudanças nas empresas e na sociedade (BREM; VOIGT, 2009). A internet mudou a indústria e o digital assumiu importância em todas as atividades económicas. Nesse sentido, esta evolução exige gerentes capazes de ajudar as empresas a superar os desafios (VASCONCELOS; KIMBLE; ROCHA, 2016). O mercado tornou-se, de modo geral, num mercado de personalização, em que a qualidade, o preço e a velocidade de entrega são enfatizados (SOUSA; ROCHA, 2019). Esta mudança trouxe novos e emergentes segmentos de clientes, diversidade cultural num mercado global, volatilidade do mercado, aumento das expectativas dos clientes em relação à qualidade dos produtos e serviços e impacto da internet no negócio principal da empresa (AKERMAN; GAARDER; MOGSTAD, 2015).

Nas empresas seguradoras, por exemplo, já existem estudos que comprovam que a utilização da tecnologia CRM (*Customer Relationship Management*) permite desenvolver estratégias de marketing eficientes para reter os clientes, aumentando, assim, a rentabilidade destas empresas (MADHOVI; DHLIWAYO, 2017; MATIŞ; LIVIU, 2014). Na indústria hoteleira, de acordo com alguns estudos, as tecnologias de informação revelam-se também um fator determinante para reduzir custos e aumentar a rentabilidade, contribuindo para a satisfação e lealdade dos clientes (HASSAN; HUSSAIN; RAHMAN, 2013;



KARIMI; SOMERS; GUPTA, 2001). Na indústria da restauração, a tecnologia tem impulsionado as compras online, permitindo aos restaurantes não só desenvolver o seu mercado (NG; WONG; CHONG, 2017; YEO; GOH; REZAEI, 2017), mas também aumentar a produtividade, a precisão das encomendas e estabelecer uma relação com os clientes (KIMES, 2011). Com o aumento do uso dos telemóveis, os bancos encontraram também uma grande oportunidade de melhorar a retenção de clientes (SHAIKH; KARJALUOTO, 2015). Para Alonso-dos-Santos, Soto-Fuentes e Valderrama-Palma (2020), a utilização do serviço *mobile banking* tem uma relação forte e direta com a fidelidade.

Particularmente no setor desportivo, o crescimento do uso das tecnologias permitiu facilitar e melhorar a adesão à prática desportiva e deve ser entendido como um meio que influencia essa mesma prática (VALCARCE; DÍEZ, 2018). Já existem estudos que indicam que a adesão é maior nos indivíduos que utilizam aplicações móveis (DU *et al.*, 2016; VOTH; OELKE; JUNG, 2016). No entanto, é importante que a sua utilização seja utilizada para facilitar a retenção dos sócios, para além de garantir a prática desportiva. Com esse objetivo começam a surgir empresas a investir nas aplicações de *fitness* (TU; HSIEH; FENG, 2018).

Quanto à utilização das redes sociais, de acordo com Richter e Kazley (2020), estas são utilizadas por alguns hospitais para envolver os consumidores e para melhorar a educação e informação em questões relacionadas com a saúde. De acordo com os mesmos autores, os hospitais com uma página no *Facebook* e com mais "gostos", tinham mais pacientes a recomendar o hospital e um maior índice de satisfação geral. Outro estudo realizado num hospital, verificou que as redes sociais influenciam a fidelização dos clientes (SANTOSO; DEWI, 2020). Gamboa e Gonçalves (2014) verificaram também o papel das redes sociais na fidelização de clientes, no setor do retalho. De acordo com este estudo, os fãs da marca *Zara* no *Facebook* tinham um nível de confiança mais elevado, estavam mais satisfeitos e, conseqüentemente, expressavam mais lealdade à marca. No seu estudo realizado na indústria das pizzas, He, Zha e Li (2013), concluem que as redes sociais desempenham um papel importante na sustentação de uma relação positiva com os clientes, revelando-se indispensáveis para atrair novos clientes, melhorar a satisfação dos utilizadores, aumentar as vendas e receitas, fidelizar e, conseqüentemente, construir uma boa reputação da marca.



No que diz respeito às redes sociais no contexto desportivo, segundo García-Fernández *et al.* (2017), estas promovem a interação entre a empresa e o cliente, levando a um maior envolvimento e compromisso. Isto cria mais referências ao produto e à marca, criando experiências e contribuindo para o processo de inovação e retenção (BOWDEN, 2009; BRODIE *et al.*, 2011; PRAHALAD; RAMASWAMY, 2004).

García-Fernández *et al.* (2017) verificaram com o seu estudo que existe uma relação positiva entre o número de seguidores das redes sociais e a receita dos ginásios, devendo fazer parte das estratégias de marketing destas empresas. As redes sociais levam a que os seguidores aumentem a sua afinidade com o ginásio. A tecnologia faz parte do valor percebido pelo cliente, diretamente relacionado à qualidade percebida e, portanto, também à satisfação e por sua vez à retenção, já que a satisfação dos clientes e a qualidade de serviço estão ambas relacionadas indiretamente com a retenção (GARCÍA-FERNÁNDEZ *et al.*, 2020).

O mercado do *fitness* encontra-se saturado, levando os ginásios a procurar métodos que fidelizem e atraiam novos clientes. O uso das tecnologias revela-se cada vez mais uma necessidade para os centros de *fitness*, bem como o uso das redes sociais, mas a literatura não é unânime em relação ao impacto da sua utilização na retenção do cliente. Assim, o objetivo da presente revisão sistemática é identificar a influência das redes sociais e tecnologias na retenção de clientes em centros de *fitness*.

2 MÉTODO

O estudo foi desenvolvido seguindo a estrutura e recomendação de outras revisões sistemáticas (CASTRO-PINERO *et al.*, 2010; RUIZ-ARIZA *et al.*, 2017; ZANATTA *et al.*, 2018) e o tratamento utilizado pelas orientações do PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analysis*) para relatórios e estudos. A recomendação PRISMA define-se como um conjunto de itens baseados em evidências, para realizar revisões sistemáticas e meta-análises. Consiste numa lista de verificação e num diagrama de fluxo. O PRISMA é composto por uma *checklist* de 27 itens, que ajudam o autor a certificar-se que analisou todos os aspetos da revisão sistemática. Inclui também um fluxograma



com o número total de referências encontradas, número de artigos que foram excluídos nas várias fases e número de artigos chegaram à fase final. O objetivo do PRISMA é ajudar os autores a melhorarem o relato de revisões sistemáticas e meta-análises (MOHER *et al.*, 2009).

2.1 SELEÇÃO DA LITERATURA

Durante o mês de dezembro de 2019 foi realizada uma pesquisa abrangente de quatro bases de dados (*Web of Science*, *Scopus*, *EBSCO* e *PubMed*), de janeiro de 2011 a dezembro de 2019. As principais categorias de termos de pesquisa em inglês foram: 1) “*retention*” (*fidelity, loyalty, adherence*), 2) “*health fitness club*” (*fitness center, health club, gymnasium*), 3) “*technology*” (*social networks, mobile phone, smartphone, app, facebook, twitter, Instagram, gamification*). O Quadro 1 apresenta os principais termos utilizados na pesquisa por categoria.

Quadro 1 - Estratégia de pesquisa nas bases de dados.

Base de dados	Estratégia de Pesquisa	Limites	Total de artigos obtidos	Total de artigos selecionados
Web of Science	(TS=(retention OR fidelity OR loyalty OR adherence) AND TS=(health fitness club* OR fitness center* OR health club* OR gymnasium) AND TS=(technology OR social networks OR mobile phone OR smartphone OR app* OR facebook OR twitter OR instagram OR gamification))	Data de publicação: Após 2011; Tipo de documento: Article ou Review; Idioma: Português, Inglês e Espanhol. Open Access	97	2
Scopus	(retention OR fidelity OR loyalty OR adherence) AND (health AND fitness AND club* OR fitness AND center* OR health AND club* OR gymnasium) AND (tec	Data de publicação: Após 2011; Tipo de fonte:	56	2

(Continued on next page)



	<i>hnology OR social AND networks OR mobile AND phone OR smartphone OR app* OR facebook OR twitter OR instagram OR gamification)</i>	<i>Journals</i> Tipo de documento: <i>Article, Review</i> Idioma: Português, Inglês e Espanhol. Open Access		
EBSCO	<i>((retention OR fidelity OR loyalty OR adherence) AND (health fitness club* OR fitness center* OR health club* OR gymnasium) AND (technology OR social networks OR mobile phone OR smartphone OR app* OR facebook OR twitter OR instagram OR gamification)</i>	Data de publicação: de 01/01/2011 a 31/12/2019 Tipo de fonte: Revistas Científicas (analizadas por pares) Idioma: Português, Inglês e Espanhol. Texto Integral	303	6
PubMed	<i>((retention OR fidelity OR loyalty OR adherence)) AND (health fitness club* OR fitness center* OR health club* OR gymnasium)) AND (retention OR fidelity OR loyalty OR adherence) AND (health AND fitness AND club* OR fitness AND center* OR health AND club* OR gymnasium) AND (technology OR social AND networks OR mobile AND phone OR smartphone OR app* OR facebook OR twitter OR instagram OR gamification)</i>	Data de publicação: Após 2011; Idioma: Português, Inglês e Espanhol. Free Full Text	2	0

Fonte: Autores.

2.2 LIMITES DA PESQUISA

Foi utilizado um conjunto predeterminado de critérios de inclusão com o intuito de selecionar os documentos para esta revisão sistemática. Os



documentos seleccionados para inclusión na revisión sistemática foram analisados no que diz respeito aos seguintes critérios:

- (1) O estudo incluía um relatório de texto completo publicado em jornal, revista, revista académica ou revista especializada, analisado por especialistas.
- (2) O estudo incluía uma população de ambos os géneros e de todas as faixas etárias;
- (3) O estudo utilizava investigações do tipo transversal, longitudinal ou estudo caso;
- (4) O estudo incluía artigos escritos em inglês, português ou espanhol;
- (5) Não foram utilizados critérios de exclusão relativos à origem étnica.

Os artigos foram incluídos se preenchessem todos esses critérios precedentes. Estes artigos foram importados para um banco de dados de referência (Mendeley).

2.3 AVALIAÇÃO DA QUALIDADE

A avaliação da qualidade foi realizada com base em listas de avaliação padronizadas (CASTRO-PINERO *et al.*, 2010; RUIZ-ARIZA *et al.*, 2017), bem como nos critérios de seleção referidos acima. A lista incluiu 5 itens (A-E): A- Estudo com relatório de texto completo publicado em jornal, revista, revista académica ou revista especializada, analisado por especialistas; B- A população do estudo abrangia ambos os géneros e todas as faixas etárias; C- Os resultados da retenção de clientes dos centros de *fitness* eram claramente descritos; D- Os resultados incluíam informação relativa ao uso de tecnologias em centros de *fitness*; E- O tipo de investigação era transversal, longitudinal ou estudo caso.

Cada item foi classificado como '2' (se o critério era claro e totalmente referido no artigo analisado), '1' (se o critério era moderadamente referido no artigo analisado) ou '0' (se o critério não era referido ou estava pouco claro no artigo). Para todos os estudos foi calculado um índice de qualidade total, através da contagem do número de itens positivos numa pontuação total de 0 a 10. Foram estabelecidos três níveis de evidência. Os estudos foram definidos como de alta qualidade (AQ), se a pontuação fosse igual ou superior a 8, de qualidade média (QM), se a pontuação total se situasse entre 5 e 7 e de qualidade baixa (QB), se a pontuação fosse igual ou inferior a 4. Assim, verificou-se que cinco



artigos eram de alta qualidade e cinco de média qualidade (Quadro 2).

Quadro 2 - Lista de artigos com o respetivo nível de qualidade.

Artigos	A	B	C	D	E	Pontuação Total	Nível de Qualidade
SPERANDEI; VIEIRA; REIS, 2016.	2	2	1	0	2	7	QM
HERRERA <i>et al.</i> , 2019.	2	2	2	2	2	10	AQ
MIDDELKAMP; ROOIJEN; STEENBERGEN, 2016.	2	2	1	0	2	7	QM
GONÇALVES; MEIRELES; CARVALHO, 2016.	2	2	2	0	2	8	AQ
LEŚNIEWSKA, 2014.	2	0	1	2	2	7	QM
GOŁOWSKA; PIĄTKOWSKA; LENARTOWICZ, 2019;.	2	2	1	0	2	7	QM
GIUDICATI; RICCABONI; ROMITI, 2013.	2	2	2	0	2	8	AQ
TSITSKARI; CH; G., 2014.	2	2	2	0	2	8	AQ
LISTER <i>et al.</i> , 2014.	2	0	0	2	2	6	QM
FERREIRA BARBOSA; LOUREIRO; ALVES, 2019.	2	2	2	0	2	8	AQ

Nota: Avaliação para a pontuação total: Alta Qualidade (AQ) = 8-10; Qualidade Média (QM) = 5-7; Qualidade Baixa (QB) = 0-4. A: Estudo com relatório de texto completo publicado em jornal, revista, revista académica ou revista especializada, analisado por especialistas. B: A população estudada abrange ambos os géneros e todas as faixas etárias. C: Os resultados da retenção de clientes dos centros de *fitness* foram claramente descritos. D: Os resultados incluíam informação relativa ao uso de tecnologias em centros de *fitness*. E: O tipo de investigação é transversal, longitudinal ou estudo caso.

Fonte: Autores.

3 RESULTADOS

O fluxograma dos resultados da pesquisa através do processo de revisão sistemática é apresentado na Figura 1. O número total de artigos obtidos com a pesquisa foi de 458 artigos. Após a exclusão os artigos duplicados, foram selecionados para leitura 362 artigos, dos quais se excluíram 322 pela leitura do título (n=40), 25 pela leitura do resumo (n=15) e dois pela relevância do resultado. No total, foram considerados 13 artigos. Estes artigos foram analisados de acordo com os critérios de seleção, com base nos quais, foram excluídos três artigos. Após esta seleção, foram incluídos na revisão sistemática 10 artigos.

Uma análise detalhada destes estudos revelou que quatro eram transversais (40%) (FERREIRA BARBOSA; LOUREIRO; ALVES, 2019; GOŁOWSKA; PIĄTKOWSKA; LENARTOWICZ, 2019; GONÇALVES;

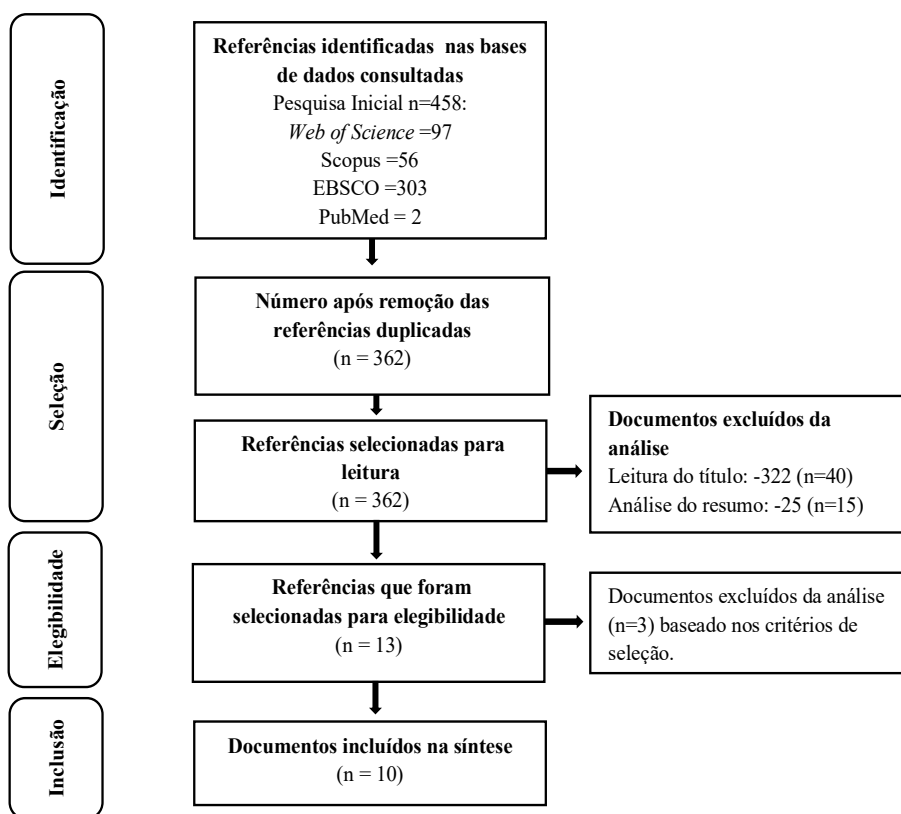


MEIRELES; CARVALHO, 2016; TSITSKARI; CH; G., 2014), cuatro eram longitudinais (40%) (GIUDICATI; RICCABONI; ROMITI, 2013; HERRERA *et al.*, 2019; MIDDELKAMP; ROOIJEN; STEENBERGEN, 2016; SPERANDEI; VIEIRA; REIS, 2016) e dois eram estudos caso (20%) (LEŚNIEWSKA, 2014; LISTER *et al.*, 2014).

Esta revisão inclui uma amostra com n=16.370.945, cujo tamanho variou de 76 (GOCŁOWSKA; PIĄTKOWSKA; LENARTOWICZ, 2019) a 9674,945 participantes (GIUDICATI; RICCABONI; ROMITI, 2013). As amostras eram de 11 países diferentes: Portugal (FERREIRA BARBOSA; LOUREIRO; ALVES, 2019; GONÇALVES; MEIRELES; CARVALHO, 2016), Espanha (HERRERA *et al.*, 2019; MIDDELKAMP; ROOIJEN; STEENBERGEN, 2016), Itália (GIUDICATI; RICCABONI; ROMITI, 2013; MIDDELKAMP; ROOIJEN; STEENBERGEN, 2016), França, Holanda, Bélgica, Luxemburgo, Alemanha (MIDDELKAMP; ROOIJEN; STEENBERGEN, 2016), Chipre (TSITSKARI; CH; G., 2014), Brasil (SPERANDEI; VIEIRA; REIS, 2016) e Polónia (GOCŁOWSKA; PIĄTKOWSKA; LENARTOWICZ, 2019; LEŚNIEWSKA, 2014). Informações detalhadas sobre todos os estudos são apresentadas no Quadro 3, que se encontra no Apêndice, no final deste artigo.



Figura 1 - Fluxograma dos documentos seleccionados, segundo a recomendação PRISMA.



Fonte: Autores.

4 DISCUSSÃO

As redes sociais revelam-se ferramentas indispensáveis para atrair novos clientes, aumentar a satisfação e as vendas e fortalecer a imagem da marca (He et al., 2013). São vários os autores que relacionam a utilização das redes sociais com a retenção e fidelização do cliente no setor do *fitness* (Bowden, 2009; Brodie et al., 2011; García et al., 2015; Prahalad & Ramaswamy, 2004). De acordo com García-Fernández *et al.* (2020), também a tecnologia está relacionada com a retenção. A utilização da tecnologia em ginásios, quando corretamente utilizada, representa um diferencial frente aos concorrentes do mercado, podendo proporcionar vantagem competitiva, diminuição dos custos e aumento dos lucros (Pedragosa, 2021b)

Após a análise dos 10 estudos, para além das variáveis redes sociais e tecnologias, foram também identificadas e analisadas as variáveis



características pessoais dos sócios, frequência e tempo de utilização e qualidade do serviço e satisfação, como influenciadoras da retenção de sócios.

4.1 VARIÁVEIS QUE INFLUENCIAM A RETENÇÃO DE CLIENTES

4.1.1 Redes Sociais

Dos 10 estudos analisados, dois investigam as redes sociais no contexto do *fitness* (GIUDICATI; RICCABONI; ROMITI, 2013; HERRERA *et al.*, 2019). Para Giudicati *et al.* (2013), o impacto das redes sociais na satisfação e no compromisso do cliente deve ser levado em consideração, pois a inclusão de fatores sociais aumenta significativamente o poder preditivo do modelo de retenção de clientes. Em particular, o número e a intensidade dos vínculos sociais, isto é, a centralidade nas redes sociais, tem um papel significativo na restrição da taxa de rotatividade dos clientes. A gestão das redes sociais de experiência compartilhada desempenha um papel crucial na criação e manutenção de vantagem competitiva sustentável no setor de serviços.

De acordo com o estudo de Herrera *et al.* (2019), a análise das redes sociais no setor de *fitness* é uma realidade e uma necessidade para a fidelização e retenção de clientes, o que leva a procurar formas eficazes de as utilizar como parte da estratégia de marketing, para comunicar com os sócios e gerir o posicionamento da marca. Os resultados deste estudo indicam, ainda, o *Facebook* como a rede social mais utilizada, tendo-se verificado um aumento notável da utilização da rede social do *Instagram*. Ainda assim, o *Twitter* verificou-se a 2ª rede mais utilizada, seguida do *Instagram*.

4.1.2 Tecnologias

Dos estudos selecionados, são quatro os que se referem ao uso da tecnologia no sector do *fitness* (GIUDICATI; RICCABONI; ROMITI, 2013; HERRERA *et al.*, 2019; LEŚNIEWSKA, 2014; LISTER *et al.*, 2014). No seu estudo, Leśniewska (2014) apresenta duas soluções tecnológicas de gestão da relação com o cliente (CRM) num clube de *fitness*, para garantir um bom e contínuo atendimento ao cliente, criando uma relação de longo prazo entre este e a empresa. Neste estudo, são apresentadas duas ferramentas de CRM de Informação Tecnológica (IT), o *Perfect Gym-Club Management Software* e o



Suunto Fitness Solution, concebidas para gerir um *health and fitness club* ou um ginásio.

De acordo com a autora, as principais vantagens desse tipo de CRM são um contato constante e regular com o cliente (com um sistema de envio de relatórios), uma transferência sistemática de informações dentro da instituição (organizando o histórico de interações com clientes de alto risco), um controlo constante do progresso dos clientes e da sua atitude face ao treino, bem como um controlo da frequência de idas ao ginásio. Este revela-se um grande trunfo, da perspetiva interna da instituição. No entanto, o facto de serem constantemente solicitados aos sócios os dados pessoais (número de telefone, endereço de e-mail etc.), de serem abordados no ginásio e incentivados a conversar, o facto de serem incomodados por mensagens regulares enviadas automaticamente para o telemóvel ou e-mails com novas ofertas ou eventos podem ser percebidos por alguns sócios como perturbadores. As funções da ferramenta de IT apresentada ajudam a gerir o centro de *fitness*, sendo algumas opções voluntárias para o sócio (por exemplo, a utilização da aplicação móvel ou a sincronização com as redes sociais). Por outro lado, podem revelar-se uma desvantagem para os sócios, por exemplo para aqueles que preferem alguma privacidade enquanto frequentam o ginásio. É um grande desafio definir a fronteira entre o que é esperado e aceite pelos sócios e o que não é.

Para os clientes interessados em observar regularmente o progresso do treino, os relatórios da *Suunto* enviados após as sessões podem ser altamente motivadores. A visualização na tela da frequência cardíaca e do consumo de energia durante as aulas de grupo, bem como o envio dos resultados por e-mail após a sessão, ajudam a aumentar a motivação dos clientes. Este relatório, em particular, é um exemplo de como o CRM funciona e de como a instituição se preocupa com os clientes, enviando-lhes algumas orientações sobre o que fazer e a frequência com que devem treinar. A principal diferença entre o *Perfect Gym* e o *Suunto Solution* é que o primeiro é utilizado principalmente para apoiar o trabalho dos gestores com os clientes, enquanto o segundo é uma ferramenta usada para manter contato com os clientes e melhorar a sua motivação. No entanto, Leśniewska (2014) sugere o uso de ferramentas que possam apoiar a gestão em vários aspetos, tendo também em consideração a perspetiva dos clientes. Os dados organizados corretamente podem ser uma fonte rica de



informações sobre as necessidades, hábitos, frequência de treino, tipo de atividade preferida, caráter de motivação, objetivos. Isto pode ser útil quando forem preparadas ofertas individuais para o cliente ou quando for necessário utilizar as estatísticas para gerir os horários das aulas em grupo ou fazer algumas classificações. Sabendo que cada cliente tem expectativas e necessidades diferentes, é crucial garantir que estes dados sejam analisados adequadamente e que seja apresentada uma oferta única e individualizada ao cliente, para garantir um serviço profissional. Estes aspetos fazem diferença quando se trata de escolher o serviço e podem criar uma relação de longo prazo entre o cliente e a empresa (LEŚNIEWSKA, 2014). Portanto, à vista deste artigo, pode-se deduzir que estes CRM facilitam a retenção de clientes em centros de *fitness*.

Outros estudos como o de Giudicati *et al.* (2013) investigam a tecnologia RFID (*Radio Frequency Identification*). Os autores trazem algumas ideias sobre como os gestores podem aproveitar as informações geradas por RFID para melhorar a satisfação e o compromisso do cliente. A conclusão a que chegam sugere que esta tecnologia deve ser profundamente integrada nos sistemas de gestão de relação com o cliente, pois é um modo de reunir e partilhar informações do cliente. Estes sistemas inteligentes de rastreio de cliente para cliente devem ser combinados com o marketing boca a boca, para aumentar a lealdade do cliente (GIUDICATI; RICCABONI; ROMITI, 2013).

Ainda no tema das tecnologias, no que diz respeito às páginas *web* dos ginásios, ficou provado que a sua popularidade diminuiu (HERRERA *et al.*, 2019). Verifica-se, portanto, uma utilização cada vez menos recorrente deste tipo de tecnologia.

Por último, Lister *et al.* (2014) analisaram a gamificação das aplicações de saúde e *fitness*, como um potencial influenciador no comportamento de saúde de um consumidor. Os autores verificaram, pelo número de aplicações encontradas na *Apple App Store* que contêm alguns componentes da gamificação, que o seu uso em aplicações de saúde e *fitness* se tornou bastante popular. As aplicações representam um mercado muito promissor para criar um comportamento de mudança na área da saúde. De modo geral, os resultados revelaram um uso abundante da gamificação em aplicações de saúde e *fitness* (LISTER *et al.*, 2014). Ainda que não seja diretamente mencionado no artigo, pensa-se que a gamificação influencia positivamente a retenção de clientes.



4.1.3 Características Personais

Da totalidade dos 10 estudos, são três os que se referem às características pessoais do cliente no processo de renovação e retenção (FERREIRA BARBOSA; LOUREIRO; ALVES, 2019; GIUDICATI; RICCABONI; ROMITI, 2013; SPERANDEI; VIEIRA; REIS, 2016). Giudicati *et al.* (2013) verificaram que as características individuais desempenham um papel importante nas decisões de renovação. As características pessoais, como género dos clientes e a idade, afetam significativamente as decisões de abandono dos centros de *fitness* pelos clientes. Os autores concluíram que trabalhadores, imigrantes, homens e jovens clientes revelaram menor hipótese de renovar a inscrição.

De acordo com Sperandei *et al.* (2016), as variáveis idade, nível de atividade física e índice de massa corporal e as motivações para perda peso, saúde, estética e hipertrofia, estão relacionadas com a probabilidade de um indivíduo se manter retido no ginásio. Através do seu estudo, criaram estimativas para o perfil do melhor prognóstico: acima de 35 anos, ativo, não motivado pela perda de peso e motivado pela hipertrofia, saúde e estética; e do pior prognóstico: idade até 25 anos, que nunca praticou atividade física, motivado pela perda de peso e não motivado pela hipertrofia, saúde ou estética. Mesmo os indivíduos que apresentam a melhor combinação de variáveis ainda apresentam alto risco de abandono antes dos 12 meses de associação ao ginásio (SPERANDEI; VIEIRA; REIS, 2016). Pelo contrário, no seu estudo, Ferreira Barbosa *et al.* (2019) verificaram que as características pessoais dos sócios, nomeadamente o género, idade e as habilitações académicas, não influenciam a satisfação global dos sócios e, por sua vez, a retenção.

4.1.4 Frecuência e Tempo de Utilização

São cinco os estudos que procuram examinar a frequência e/ou tempo de utilização no contexto da retenção (FERREIRA BARBOSA; LOUREIRO; ALVES, 2019; GIUDICATI; RICCABONI; ROMITI, 2013; GONÇALVES; MEIRELES; CARVALHO, 2016; MIDDELKAMP; ROOIJEN; STEENBERGEN, 2016; SPERANDEI; VIEIRA; REIS, 2016). De acordo com o estudo de Gonçalves *et al.* (2016), a frequência semanal (número de assistências ao ginásio) não mostra



capacidad explicativa para predecir a satisfacción e retención, ou seja, a frequência semanal não contribui para maior satisfação ou retenção. Ferreira Barbosa *et al.* (2019) verificaram também que o tempo de utilização, frequência e horário de utilização do ginásio não influenciam a satisfação global dos sócios e, assim, a retenção.

No seu estudo, Middelkamp *et al.* (2016) aplicaram as fases de mudança do Modelo Transteórico de Mudança de Comportamento para analisar os padrões de comportamento dos participantes em centros de *fitness*. Os resultados revelaram que apenas 10% dos sócios alcançaram a fase de manutenção (Atividade Física regular há mais de 6 meses) sem recaídas, mas que estes têm maior probabilidade de continuar a frequentar até ao 12º mês, mesmo com frequências baixas. Os resultados deste estudo indicaram que 19,5% nunca frequentaram o ginásio. O comportamento médio de frequência foi extremamente baixo e a sua diminuição foi substancial - 12,5 vezes menor no 24º mês, em comparação ao primeiro mês completo. Os resultados revelaram que apenas 2,3% nunca teve uma recaída durante os 24 meses e que 50% dos que tiveram uma recaída durante um mês reiniciou no mês seguinte.

Com o seu estudo Sperandei *et al.* (2016) concluíram que 63% dos novos sócios abandonarão as atividades antes do terceiro mês e menos de 4% permanecerá por mais de 12 meses de atividade contínua. De acordo com estes estudos torna-se claro que devem ser desenvolvidas estratégias apropriadas para melhorar o comportamento de frequência e assim, a retenção de clientes.

O estudo de Giudicati *et al.* (2013) contribuiu para uma melhor compreensão do papel da experiência no compromisso do cliente e nas decisões de renovação, distinguindo três componentes da experiência do cliente: posse (tempo em meses de permanência no ginásio), padrões de uso (representado pelo preço por presença-rácio entre o preço do contrato e o número de presenças durante o mesmo) e relação com o cliente. A posse e os padrões de uso demonstraram ter um efeito negativo na probabilidade de renovação do contrato, verificou-se, portanto, que ambas afetam as decisões de renovação. Verificaram que quanto mais longa a associação ao *health club*, menor a probabilidade de renovação e também que os clientes que pagam um preço mais alto por presença (menor uso do contrato) têm maior probabilidade de renovar inscrição. O tempo decorrido da expiração do contrato tem um efeito negativo,



confirmando que a maioria das decisões de renovação é tomada imediatamente após a expiração do contrato anterior.

4.1.5 Qualidade do Serviço e Satisfação de Clientes

Dos 10 estudos analisados, quatro verificam a relação das variáveis satisfação dos sócios e qualidade do serviço com a retenção de clientes (FERREIRA BARBOSA; LOUREIRO; ALVES, 2019; GOĆŁOWSKA; PIĄTKOWSKA; LENARTOWICZ, 2019; GONÇALVES; MEIRELES; CARVALHO, 2016; TSITSKARI; CH; G., 2014). Gocłowska *et al.* (2019) indicam que para melhorar a qualidade dos serviços oferecidos é fundamental medir a satisfação do cliente. De acordo com os autores, as empresas devem focar-se mais nas áreas que identificaram como pontos fracos e ameaças em termos de nível de satisfação do sócio do *fitness club*: a localização, o preço e as atividades promocionais do *fitness club*.

Tsitskari *et al.* (2014) concluíram com o seu estudo que a qualidade do serviço, mais especificamente, a dimensão funcionários, prevê direta e indiretamente, através da satisfação do cliente, o compromisso psicológico. Os autores destacam, então, a importância das estratégias de recrutamento e de treino do Staff para a retenção de clientes. Tsitskari *et al.* (2014) defendem ainda que a criação de uma atmosfera calorosa e amigável nas instalações e nas aulas deve ser uma prioridade e que tanto a equipa administrativa quanto os profissionais de *fitness* devem contribuir nesse sentido. Para os mesmos autores, perceções positivas da qualidade do serviço levam a uma satisfação maior, o que, por sua vez, leva ao compromisso do cliente e, possivelmente, à retenção do cliente.

No seu estudo, Ferreira Barbosa *et al.* (2019) verificaram também que existe uma relação positiva entre perceção da qualidade do serviço e satisfação global dos clientes, influenciando a retenção. Neste estudo, a qualidade dos serviços apresenta uma maior relevância para a satisfação global dos sócios, seguido da qualidade dos equipamentos e, por fim, a relação qualidade-preço.

De acordo com Gonçalves *et al.* (2016), a satisfação depende muito das expectativas dos sócios sobre o serviço. Portanto, é importante manter constantemente e, se possível, exceder as expectativas dos sócios para que eles permaneçam satisfeitos por mais tempo. Assim, quando os gerentes intervêm



nas expectativas em relação à satisfação do cliente com o serviço, eles influenciam a retenção (GONÇALVES; MEIRELES; CARVALHO, 2016).

5 CONCLUSÃO

A constante expansão dos centros de *fitness* leva a que os gestores procurem formas de reter e atrair novos clientes. Deste ponto de vista, com esta revisão sistemática, procurou-se identificar a influência das redes sociais e tecnologias na retenção de clientes em centros de *fitness*.

A pesquisa foi efetuada em 4 bases de dados, de 2011 a 2019. Um total de 10 artigos correspondeu aos critérios de inclusão dos quais quatro eram transversais, quatro longitudinais e dois estudos de caso. Dentre os 10 estudos, para além das variáveis redes sociais e tecnologias, verificou-se que as variáveis características pessoais dos sócios, frequência e tempo de utilização, qualidade do serviço e satisfação também apresentavam influência na retenção de clientes. Podemos agrupar estas variáveis em duas dimensões, uma associada com o ginásio (tecnologias e redes sociais) e outra mais ligada ao cliente (características pessoais, satisfação, perceção de qualidade do serviço, frequência semanal de utilização), conforme mostra a figura 2.

Dois estudos identificaram a importância das redes sociais no processo de retenção de clientes (GIUDICATI; RICCABONI; ROMITI, 2013; HERRERA *et al.*, 2019). No que toca às tecnologias, um estudo destacou duas ferramentas de CRM como uma oferta importante para criar uma relação duradoura cliente-empresa (LEŚNIEWSKA, 2014). Outro estudo apontou a tecnologia *Radio Frequency Identification* (RFID) para o aumento da fidelidade do cliente (GIUDICATI; RICCABONI; ROMITI, 2013). Quanto às páginas *web* dos ginásios, um estudo indicou que a sua popularidade tem vindo a diminuir (HERRERA *et al.*, 2019). Apenas um estudo se referiu à gamificação das aplicações de saúde e *fitness* como influenciador no comportamento de saúde (LISTER *et al.*, 2014) e, ainda que não seja diretamente referenciado no estudo, pensa-se que a gamificação influencia positivamente a retenção de clientes. Conclui-se, portanto, que as redes sociais e o uso das tecnologias têm uma influencia positiva na retenção de clientes em ginásios.

Há três estudos que se referem às características pessoais dos sócios (FERREIRA BARBOSA; LOUREIRO; ALVES, 2019; GIUDICATI; RICCABONI;



ROMITI, 2013; SPERANDEI; VIEIRA; REIS, 2016). Desses, dois referem a sua influência no processo de renovação (GIUDICATI; RICCABONI; ROMITI, 2013; SPERANDEI; VIEIRA; REIS, 2016).

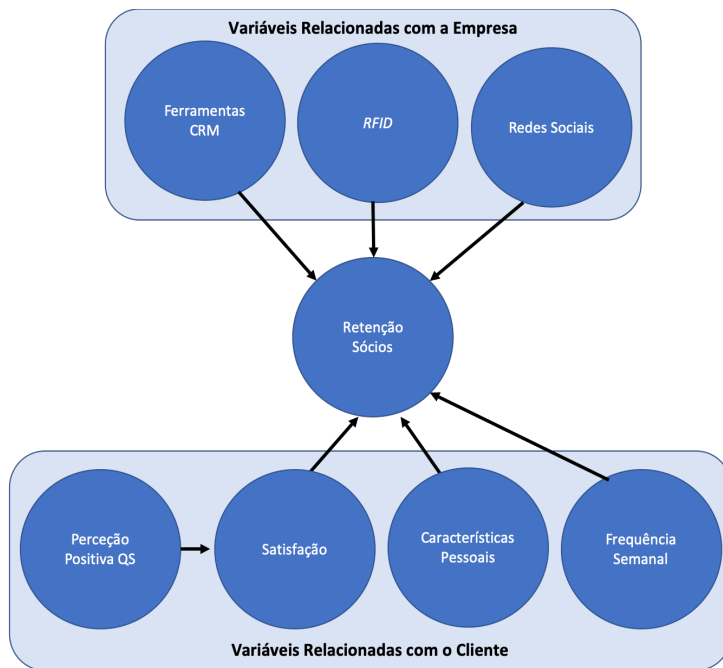
São dois os estudos que afirmam que a frequência semanal não mostra capacidade explicativa para prever a satisfação e retenção (FERREIRA BARBOSA; LOUREIRO; ALVES, 2019; GONÇALVES; MEIRELES; CARVALHO, 2016). No entanto, dois estudos indicam que devem ser desenvolvidas estratégias para melhorar o comportamento de frequência (MIDDELKAMP; ROOIJEN; STEENBERGEN, 2016; SPERANDEI; VIEIRA; REIS, 2016), o que sugere a sua influencia na retenção de clientes.

Medir a satisfação revela-se fundamental para melhorar a qualidade dos serviços (GOŁOWSKA; PIĄTKOWSKA; LENARTOWICZ, 2019). São três os estudos que sugerem que percepções positivas da qualidade do serviço levam a maior satisfação dos sócios e, por sua vez, à retenção (FERREIRA BARBOSA; LOUREIRO; ALVES, 2019; GONÇALVES; MEIRELES; CARVALHO, 2016; TSITSKARI; CH; G., 2014). A qualidade dos serviços deve ser tida em conta já que padrões de alta qualidade levam a clientes mais satisfeitos e por sua vez mais fiéis.

É importante perceber que a criação do valor da empresa deve ser guiada pelo valor percebido pelos clientes (LANDROGUEZ; BARROSO; CEPEDA-CARRIÓN, 2013). É, por isso, importante distinguir o que a empresa percebe como qualidade, mas principalmente a percepção de qualidade do cliente sobre os serviços que oferece a empresa. Isto porque a satisfação (e consequentemente a retenção) depende muito das expectativas dos sócios sobre o serviço. Portanto, sugere-se como futura linha de investigação, integrar as diferentes perspetivas de qualidade (empresa e cliente) relacionadas ao uso das tecnologias e como esse uso influenciaria a retenção de clientes.



Figura 2 - Framework com as conclusões.



Fonte: Autores.

6 LIMITAÇÕES

Existem algumas limitações nesta revisão que devem ser mencionadas. Em primeiro lugar, o facto de não existirem muitos estudos incluídos na revisão final, apesar dos termos de busca terem sido cuidadosamente escolhidos de acordo com o tema principal do estudo. Em segundo lugar, o estudo está relacionado apenas com a opinião de três revisores. Como terceira limitação apontamos o facto de não se terem considerado as diferenças sociodemográficas da população dos diferentes estudos.

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APÊNDICE

Quadro 3 - Características dos estudos analisados (n = 10).

Autores/ Título	Ano/	Objetivo	Amostra / País	Resultados
Sperandeia, S.; Vieira, Marcelo		Avaliar a taxa de desistência		1. 63% dos novos sócios abandonarão as atividades antes do terceiro mês e menos de 4% permanecerá por

(Continued on next page)



C.; Reis, Arianne. 2016.	dos sócios de um centro de <i>fitness</i> na cidade do Rio de Janeiro e as possíveis variáveis explicativas para o fenómeno.	5240 sócios. Brasil.	mais de 12 meses de atividade contínua. 2. Variáveis relacionadas significativamente à probabilidade de um indivíduo permanecer como membro ativo do centro de <i>fitness</i> : idade, nível de atividade física e índice de massa corporal e as motivações 'perda de peso', 'saúde', 'estética' e 'hipertrofia'. 3. A partir da combinação das variáveis consideradas significativas no modelo, é possível criar perfis de indivíduos representativos e uma estimativa da probabilidade de longevidade para cada mês. 4. Mesmo os indivíduos que apresentam a melhor combinação de variáveis ainda apresentam alto risco de abandono antes dos 12 meses de associação ao centro de <i>fitness</i> .
<i>Adherence to physical activity in an unsupervised setting: Explanatory variables for high attrition rates among fitness center members.</i>			
Herrera-Torres, L.; Pérez-Tur, F.; Valcarce Torrente, M. y García-Fernández, J. 2019.	Analisar a evolução das redes sociais no setor de <i>fitness</i> em Espanha durante o período de 2015 a 2018.	215 empresas. Espanha	1. As organizações desportivas estão a perceber os benefícios das redes sociais e a procurar formas eficazes de as utilizar como parte de seu <i>marketing</i> global, para comunicar com os sócios e gerir as estratégias da marca. 2. A análise de redes sociais no setor de <i>fitness</i> é uma realidade e uma necessidade. 3. Desceu a popularidade das páginas <i>web</i> . 4. Os resultados indicaram o <i>Facebook</i> como a rede social mais utilizada e um aumento notável da rede social do <i>Instagram</i> . 5. Ainda assim, o <i>Twitter</i> é a 2ª rede mais utilizada seguida do <i>Instagram</i> .
<i>Analysis Of Social Networks In The Spanish Fitness Sector: A Longitudinal Study.</i>			
Middelkamp, J; Van Rooijen, M.; Steenbergen, B. 2016.	Aplicar as fases de mudança do Modelo Transteórico de mudança de comportamento para analisar os padrões de comportamento dos participantes em centros de <i>fitness</i> .	400 sócios. Holanda, Bélgica, Luxemburgo, Alemanha, França, Espanha e Itália	1. O comportamento de frequência dos 400 ex-sócios revelou-se problemático em relação à manutenção da saúde. 2. Apenas 10% dos sócios alcançaram a fase de manutenção sem recaídas. 3. 19,5% nunca frequentaram o centro. 4. O comportamento médio de frequência foi extremamente baixo e a sua diminuição foi substancial - 12,5 vezes menor no 24º mês em comparação ao primeiro mês completo. 5. Apenas 2,3% dos ex-sócios nunca teve uma recaída durante os 24 meses. 6. 50% dos ex-sócios que tiveram uma recaída durante um mês reiniciou no mês seguinte. 7. Ex-sócios que atingem a fase da manutenção têm maior probabilidade de
<i>Attendance Behavior of Ex-members in Fitness Clubs: A Retrospective Study Applying the Stages of Change.</i>			

(Continued on next page)



			continuar a frequentar até ao 12º mês, mesmo com frequências baixas.
Gonçalves, C.; Meireles, P.; Carvalho, M. J. 2015.	Compreender a relação entre frequência semanal de treino, as expectativas, a satisfação e a retenção de sócios em centros de fitness.	146 sócios. Portugal.	1. A frequência semanal não mostrou capacidade explicativa para predizer a satisfação e retenção (a frequência semanal não contribui para maior satisfação ou retenção.). 2. A relação entre as expectativas, a satisfação (73%) e a retenção (64%) foi estatisticamente significativa. 3. A relação entre satisfação e retenção (63%) foi positiva e significativa.
<i>Consumer behaviour in fitness club: Study of the weekly frequency of use, expectations, satisfaction and retention.</i>			
Leśniewska, A. 2014.	Apresentar uma forma de aplicar o conceito de CRM (<i>Customer Relationship Management</i>) numa instituição desportiva e discutir as suas funções e a sua utilidade, através de duas ferramentas (<i>Perfect Gym-Club Management Software e Suunto Fitness Solution</i>).	Polónia.	1. As soluções de IT apresentadas têm vários recursos de suporte à abordagem de CRM. 2. A principal vantagem deste tipo de aplicação é um contato regular com o cliente, transferência sistemática de informações dentro da instituição, controlo constante do progresso dos clientes e da sua atitude face ao treino, bem como controlo da frequência de idas ao clube. 3. As funções das ferramentas apresentadas ajudam a gerir o centro de fitness, sendo algumas opções voluntárias para o sócio. 4. Os dados organizados corretamente podem ser uma fonte rica de informações sobre as necessidades, hábitos, frequência treino, tipo de atividade preferida, carácter de motivação, objetivos etc.
<i>Customer Relationship Management In A Fitness Club - Case Study Of It Solutions Applied In A Selected Organization.</i>			
Goćłowska, S.; Piątkowska, M.;	Apresentar a metodologia de	76 por entrevist	1. Foco mais forte das empresas nas áreas que provaram ser pontos fracos e ameaças em termos de nível de

(Continued on next page)



Lenartowicz, M. 2019.	design e uso do CSI (Customer Satisfaction Index) para empresas que prestam serviços de <i>fitness</i> .	a. Polónia.	satisfação do sócio do <i>fitness club</i> : a localização, o preço e as atividades promocionais do <i>fitness club</i> . 2. A metodologia de medição da satisfação do sócio parece estar adaptada à natureza dos sócios do setor de <i>fitness</i> , bem como às pequenas e médias empresas que dominam nesse campo. 3. Medir a satisfação do cliente torna possível tomar decisões e contribuir para a qualidade dos serviços oferecidos.
<i>Customer satisfaction and its measurement in fitness clubs of Warsaw.</i>			
Giudicati, G.; Riccaboni, M.; Romiti, A. 2013.	Analisar efeitos da posse, contrato de uso e socialização na retenção de clientes.	4.649 sócios, 133.945 registros de inscrição e 4.892 contratos . Itália.	1. Clientes de longa data têm uma menor hipótese de renovar o contrato. 2. A centralidade do consumidor na rede reduz a taxa de rotatividade do cliente. 3. A inclusão de efeitos sociais aumenta o poder preditivo do modelo de rotatividade do cliente. 4. Os resultados deste estudo revelam de que modo os gestores podem aproveitar as informações geradas por RFID para melhorar a satisfação e o compromisso do cliente.
<i>Experience, socialization and customer retention: Lessons from the dance floor.</i>			
Tsitskari, E.; Antoniadis, CH; Costa, G. 2014.	Analisar os padrões de qualidade e satisfação do serviço que podem ser utilizados para prever o compromisso psicológico dos sócios com a indústria do <i>fitness</i> .	315. Chipre.	1. A dimensão "Colaboradores" derivou ser a chave para o alcance da satisfação e do compromisso psicológico dos membros dos centros de <i>fitness</i> Cypriotas. 2. A qualidade do serviço é um antecedente da satisfação do cliente.
<i>Investigating the relationship among service quality, customer satisfaction and psychological commitment in Cyprian fitness centers.</i>			
Lister, C.; West, JH; Cannon, B.; Sax, T.; Brodegard, D. 2014.	Identificar de que modo a gamificação é utilizada em aplicações de saúde e analisar a gamificação das aplicações de saúde e	132 apps.	1. O uso da gamificação em aplicações de saúde e <i>fitness</i> tornou-se imensamente popular, conforme evidenciado pelo número de aplicações encontrados na <i>Apple App Store</i> que contêm alguns componentes da gamificação. 2. As aplicações representam um mercado muito promissor para criar comportamento de mudança na área da saúde. 3. Os resultados iniciais revelam um uso abundante da gamificação em aplicações de saúde e <i>fitness</i> .
<i>Just a Fad? Gamification in Health and Fitness Apps.</i>			

(Continued on next page)



	<i>fitness</i> como um potencial influenciador no comportamento de saúde de um consumidor.		
Ferreira Barbosa, H.; Loureiro, V.; Alves, A. 2019. <i>Quality And Satisfaction In Gymsnasiums & Health Clubs.</i>	Analisar a influência da qualidade dos serviços na satisfação global dos sócios em ginásios	172 sócios. Portugal.	1. Não existem diferenças significativas na satisfação global dos sócios relacionada com as características sociodemográficas, tempo de inscrição, frequência e horário de utilização do ginásio. 2. A qualidade dos serviços apresenta uma maior relevância, seguido da qualidade de equipamentos e, por fim, a relação qualidade-preço para a satisfação global dos sócios. 3. Relação positiva entre qualidade de serviço e satisfação global.

Fonte: Auto



Chapter V: Article 2

THE USE OF FITNESS CENTRE APPS AND ITS RELATION TO CUSTOMER SATISFACTION: A UTAUT2 PERSPECTIVE

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THE USE OF FITNESS CENTRE APPS AND ITS RELATION TO CUSTOMER SATISFACTION: A UTAUT2 PERSPECTIVE

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 hypothesized relationships were tested through partial least square structural equation modelling (PLS-SEM), in a quantitative study with data from 1,678 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 do 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 – 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 organization and management of their business, not only with a view to assist in this aspect of organization 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 minimizes 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 app, 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 UTAUT2) were analysed. The UTAUT2 model was chosen for this study, since this theory is directed to the customer's perspective, which is what's 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 app 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's 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's 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 organized 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, big data are causing changes in business and society (Brem & 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: Technology Acceptance Model (TAM) (Davis *et al.*, 1989) the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh *et al.*, 2003) and the expanded Unified Theory of Acceptance and Use of Technology (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 realizes 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 organizational 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 utilization 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 organizational 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) (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.

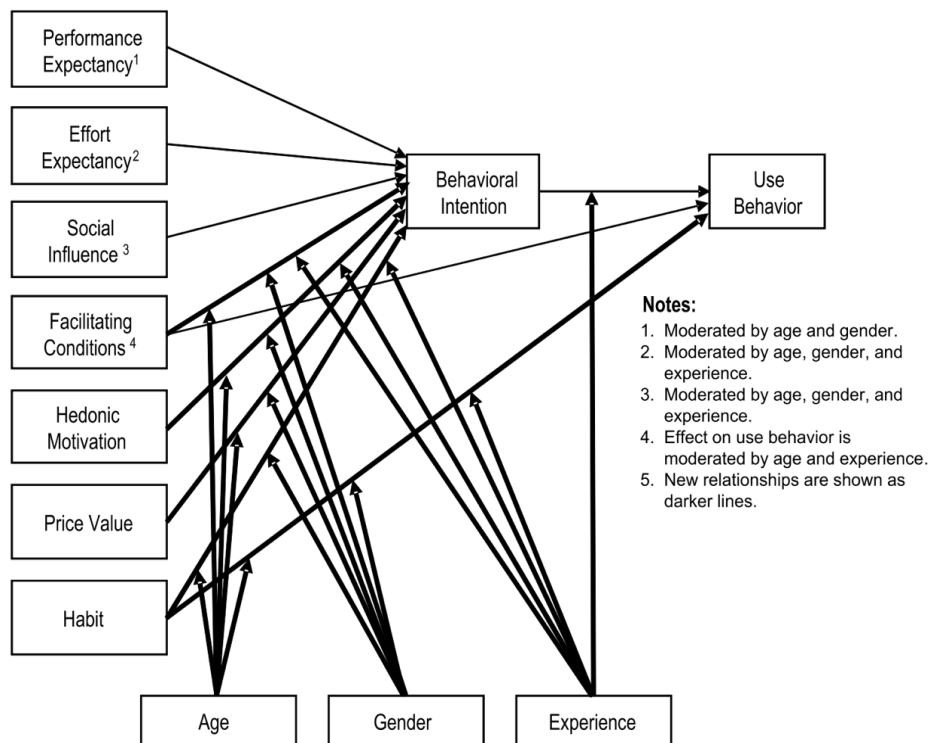


Figure 1. UTAUT2 Research model (Venkatesh *et al.*, 2012).

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 organization 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 organization (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). 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, once is 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 hypothesizes 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; Venkatesh *et al.*, 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 usable by certain groups of users and, based on which one's 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 app's 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 hypothesizes 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 conceptualized 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 hypothesize 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.

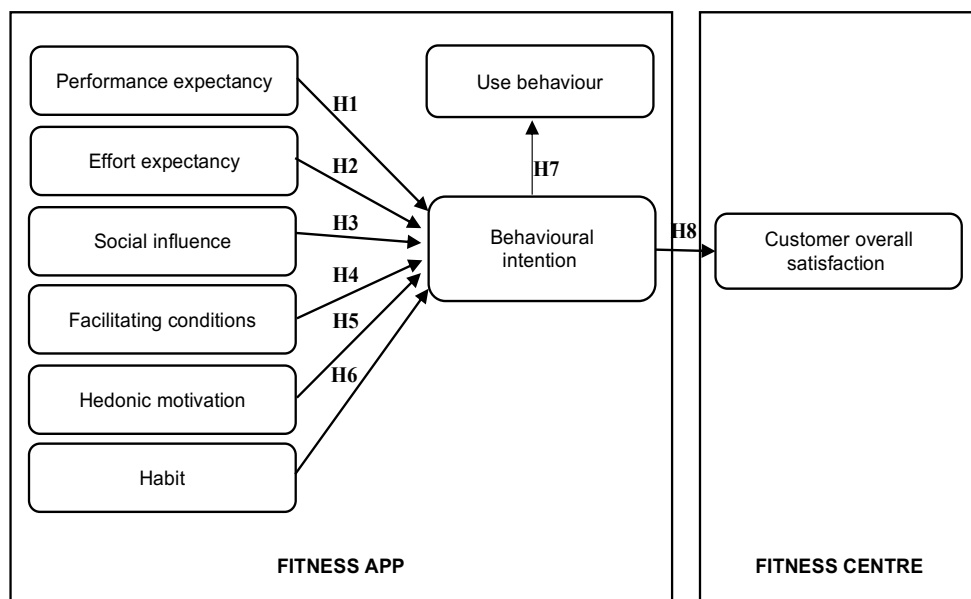


Figure 2. Research model.

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 1,678 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% ($n = 1101$) 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 characterization 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 and endogeneity.

4.3. Data analysis.

The software used for data analysis was SmartPLS 3.3.3 (Ringle *et al.*, 2015). This software is specialized 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 ratio of correlations (HTMT) 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. R² 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, minimizes the risk of respondent biases. Common method bias (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 common method bias, 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 standardized 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 I, 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 bellow 0.9.

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

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	-	-

(Continued on next page)



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

Additionally, discriminant validity of the constructs was also evaluated using Fornell-Larcker criteria. As it can be verified in Table II, 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.

Table II. Fornell-Lacker Criterion.

	BI	PE	EE	SI	FC	HM	H	OS	US
BI	0.87								
PE	0.75	0.88							
EE	0.52	0.51	0.93						
SI	0.64	0.62	0.40	0.85					

(Continued on next page)



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: 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.

5.2. Structural model.

The structural model was assessed by examining the R² values and the sign, size and significance of the path coefficients of the structural relationships. 10000 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 III and Figure 3.

Table III. Construct effects on endogenous variables (including lower and upper bounds of 95 per cent CI).

Hypotheses	Path coefficient	P Values	CIs		Supported	f ²
			5.0%	95.0%		
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

(Continued on next page)



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

With the values of R^2 it was possible to verify that the model achieves the explanatory power. The proposed model explains 75.2 per cent of the variance in behavioural intentions, 29.5 per cent of the variance in overall customer satisfaction, and 57 per cent 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 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 III.

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 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.



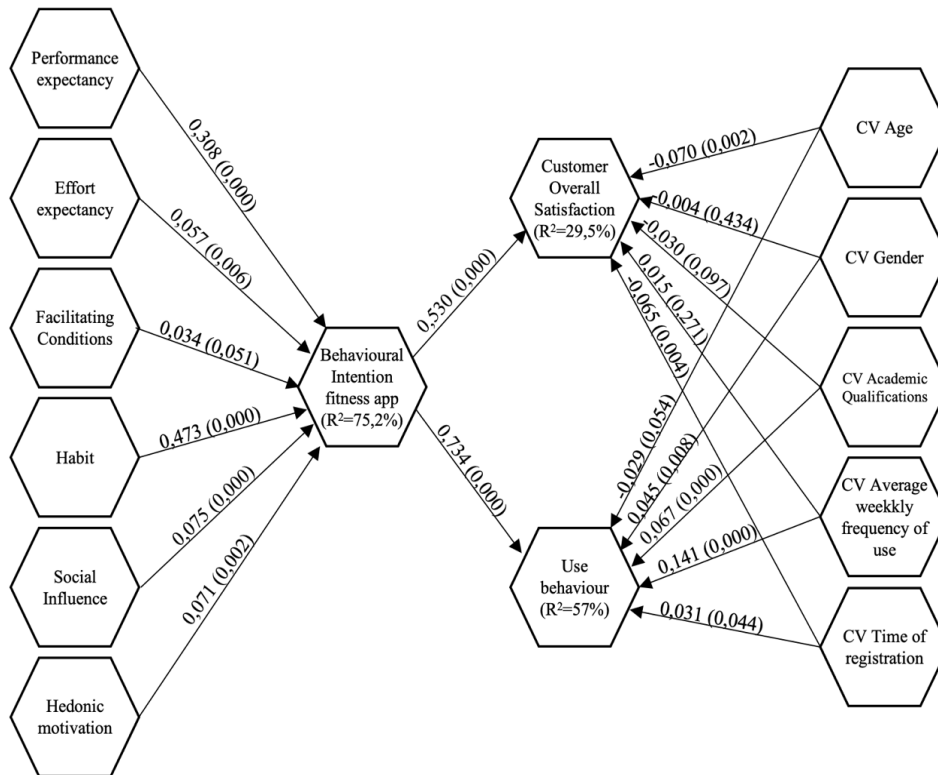


Figure 3. Structural Model Results.

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's 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. Secondly, 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 emphasize 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. Fourthly, the study was only conducted in Portugal, so the results may not be generalizable 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.

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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.	Venkatesh et al. 2012
3. My fitness app helps me perform activities faster.	
4. In general, the use of my fitness app is advantageous.	Nair, Ali and Leong, 2015
Effort expectancy	
1. Learning to use my fitness app is easy.	
2. My interaction with my fitness app is clear and understandable.	Venkatesh et al. 2012
3. My fitness app is easy to use.	
4. It is easy to become skilful in using my fitness app.	
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.	Venkatesh et al. 2012
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.	Nair, Ali and Leong, 2015
5. In general, the fitness centre has supported the use of the fitness app.	
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).	Venkatesh et al. 2012
4. I can get help from the fitness centre staff when I have difficulties using the fitness app.	
Hedonic motivation	
1. Using the fitness app is fun.	
2. Using the fitness app is enjoyable.	Venkatesh et al. 2012
3. Using the fitness app is very entertaining.	

(Continued on next page)



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
-



Chapter VI: Article 3

ADOPTION OF THE FITNESS CENTRE APP ON CUSTOMER SATISFACTION: A MULTIGROUP ANALYSIS

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BEHAVIOURAL INTENTIONS, USE BEHAVIOUR OF THE FITNESS CENTRE APP AND CUSTOMER OVERALL SATISFACTION: A MULTIGROUP ANALYSIS

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ABSTRACT

The use of fitness apps in fitness centres is not homogeneous, it varies according to the characteristics of the consumers. Based on this premise, this paper aims to analyse whether the influence of behavioural intention to use the fitness centre app in the use behaviour and in overall customer satisfaction varies according to gender, age, academic qualifications and registration time. To investigate this heterogeneity, a multi-group analysis (MGA) was used through partial least square structural equation modelling (PLS-SEM). The sample included 1,678 members of fitness centres in Portugal. The present study uses the extended Unified Theory of Acceptance and Use of Technology (UTAUT2) as the base model. The results showed that the influence of behavioural intentions on overall customer satisfaction and use behaviour varies according the consumers' socio-demographic characteristics and time of registration. The findings also revealed that the influence of behavioural intentions on both overall customer satisfaction and use behaviour is greater in men, in the youngest customers, those with lower academic qualifications and registered for less time at the fitness centre.

Keywords: MGA; age; gender; academic qualifications; time of registration; fitness centre; use behaviour; customer satisfaction, PLS-SEM.



1. Introduction.

Mobile health apps, such as fitness apps, are flooding the app market. The global downloads of these apps increased 46% in 2020 (Grand View Research, 2021). It is, therefore, not surprising that it is increasingly proving to be a trend in the fitness world (Thompson, 2021).

The constant demand for information related to the use of apps means that the mechanism behind people's intention to continue using them is still not fully understood. To study the adoption of new technologies many studies use several methods, among them, the most complete is the extended Unified Technology Acceptance Model (UTAUT2). When compared to previous models, UTAUT2 is directed to the customer's perspective and it integrates three more constructs, namely hedonic motivation, price value, and habit (Venkatesh et al., 2012), integrated 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 app are made available to members by fitness centres without any extra value.

Regarding the app used by fitness centres, it is known that their use is strongly associated with the customers' overall satisfaction with the fitness centre (Ferreira Barbosa et al., 2021) and that customer satisfaction is related to customer retention (Bodet, 2006; Nikhashemi, Paim et al., 2013; Rahmatulloh & Melinda, 2021), one of the main problems in the sector (McCarthy, 2004). Furthermore, it is known that the cost of customer retention is lower than creating new customer (Nikhashemi et al., 2013). Therefore, understanding that the increase in the use of fitness centre apps will be related to the customer's overall satisfaction with the institution, their study deserves attention. Furthermore, it is believed that the intention to use these apps is not homogeneous and may vary according to the characteristics of the consumers, as well as other factors (e.g. time of registration). Thus, the aim of this study to analyse whether the influence of behavioural intention to use the fitness centre app in the use behaviour and in overall customer satisfaction varies according the gender, age, academic qualifications and time of registration.



The remainder of the paper is organized as follows. In section number 2, literature review will be addressed the fitness centre app, theoretical models used to understand the adoption of technologies as well as to describe the variables of the study. In Section number 3, the research hypothesis and research method will be presented. Methodology will be detailed in Section 4. Results will be presented in Section 5. Section 6 conclude the paper and present the theoretical and practical implications of this study as well as presents limitations of the study and future research.

2. Literature review.

This section will review the literature on the fitness centre apps, the main models of acceptance and use of technology used and will address the main variables under study, behavioural intentions to use, use behaviour and overall customer satisfaction.

2.1. Fitness centre app.

Fitness apps can provide activities that users can perform both independently and within a fitness centre. Many fitness centres are now using technology in their facilities to motivate their members (Feld, 2018). The mobile apps used by fitness centres are generally integrated into the management software they use (King, 2018). These apps prove to be a convenient and easily accessible tool that allows fitness centres to remain constantly connected to their members. The fitness centre app make it easy for members to purchase their products, whether it's classes, special programs, personal training, or massages. Using the app customers can also check on the fitness centre schedule, ask questions, report problems and give feedback on, for example, employee performance (Feld, 2018).

These apps can help improve members' experience, and can also increase revenue and referrals by reducing operating costs (King, 2018). Among other advantages of using this type of apps is, for example, the member's mobile check-in with the QR code function, which facilitates and minimizes 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 fitness centre app is that the push notifications and communications through the app cost less than sending messages and can significantly reduce the cost of printing marketing materials such as invitations for potential members, class schedules. By using these fitness centre app it is possible to interact more with the customer, developing a closer relationship with the brand and the team (King, 2018).

2.2. Theoretical models used to understand the adoption of technologies.

One of the most widely used models in empirical studies on the acceptance and use of information systems is the Technology Acceptance Model (TAM) (Davis et al., 1989), which is still prevalent in the literature, either in its original form or in its various extensions. Subsequently, Venkatesh et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) from a profound review of the main models available in the literature, in particular, the TAM model. The UTAUT makes explicit direct antecedents of the intention to use and the use of a new technology in the organizational context (performance expectancy, effort expectancy, social influence, and facilitating conditions), as well as the moderating variables of these relationships (gender, age, experience, voluntariness) (Venkatesh et al., 2003).

Later, Venkatesh et al. (2012), developed expanded Unified Theory of Acceptance and Use of Technology (UTAUT2) with the specific aim of investigating technology acceptance and use from a consumer perspective. The UTAUT2 added important factors related to consumer behaviour, such as intrinsic or hedonic motivation, the perceived price or cost associated with the adoption of the new technology, and the habit of use, considered a relevant factor to predict continued use (Venkatesh et al., 2012). The model also includes a direct effect of facilitating conditions on behavioural intention, since, unlike in the organisational context, tools, resources and support services may vary for each



consumer (Venkatesh et al., 2012). In addition, changes were made to the moderation relations of UTAUT. For example, voluntariness was removed from the model, as it is assumed that consumer adoption of technology is always voluntary.

2.3. *Behavioural intention, use behaviour and customer satisfaction.*

Since this study is about exploring the behavioural intention to use the fitness centre app, the condition of current use is also an element of interest. In this context, behavioural intention refers to the intention of effective use by the consumer of a future product or service, refers to the willingness of an individual to use and continue to use a particular technology (Venkatesh et al., 2012). On the other hand, use behaviour refers to the act of consuming a given technological product or service, it is the behavioural action in the actual use of the system (Davis, 1989; Venkatesh and Bala, 2008; Venkatesh and Davis, 2000). Use behaviour generates experiential validation, i.e. favourable acceptance/corroboración of the experience, and experiential or cognitive transformation, which in turn generates sharing behaviour, resulting from the validation and transformation of an experience from one individual to another (Chu, 2011; Jalilvand et al., 2011).

Regarding customer satisfaction is based on a set of cognitive and emotional states that result in a subjective evaluation of a choice. In short, customer satisfaction is a psychological state resulting from the purchase and consumption process (Evrard, 1993). Satisfied customers are more likely to purchase the service again or convey positive opinions about it (Patterson & Spreng, 1997). It is important to measure customer satisfaction because it is a prospective (Kotler 2003) and predictive indicator of purchasing behaviour (Olivier, 1980). According to Kotler (2000), customer satisfaction is generated by a feeling of pleasure or disappointment at the outcome of the perceived performance of the product or service against the customer's expectations that were created in previous experiences or in word-of-mouth communication. Several authors share the opinion that customer satisfaction is essential for



retention (Rahmatulloh & Melinda, 2021; Bodet, 2006; Fornell, 1992; Rust et al., 1995), so it should be a goal for sports organizations.

3. Model development

In this section it will be addressed the relationship between the variables and present the study model (Figure 1).

3.1. Behavioural intentions to use and customer overall satisfaction relation.

Customer satisfaction depends on the expectation of the service and the perception created after consuming/using the product or service, and it is of interest to managers to understand the real degree of customer satisfaction and the reasons for this satisfaction. It is therefore important to verify which attributes of the services are most valued in order to achieve loyalty and retention, and it is essential to understand the reasons for satisfaction. Thus, in order for companies to remain competitive in the market, it is necessary to gain and maintain customer loyalty, and satisfaction emerges as an essential strategy to achieve this objective. Some studies suggest that behavioural intentions are related to consumer satisfaction (Howat et al., 1999; McDougall & Levesque, 2000; Murray & Howat, 2002). In their study, Ferreira Barbosa et al. (2021), found that the behavioural intentions of use of the fitness centre app influence customer satisfaction with the centre but there is no evidence of this relationship according to socio-demographic characteristics and time of registration in the fitness centre. According to the above, it was hypothesized that:

H1a: The influence of behavioural intentions to use the fitness centre app on overall satisfaction varies according to gender.

H2a: The influence of behavioural intentions to use the fitness centre app on overall satisfaction varies according to age.

H3a: The influence of behavioural intentions to use the fitness centre app on overall satisfaction varies according to academic qualifications.



H4a: The influence of behavioural intentions to use the fitness centre app on overall satisfaction varies according to time of registration.

3.2. *Behavioural intentions to use and use behaviour relation.*

The variable intention to use is positioned antecedent to the use construct, aiming to measure the individual's behavioural intention to use technologies. Research on behavioural intention has consistently shown that behavioural intention is the strongest predictor of actual use (Davis, 1989). There being a higher probability of using a certain technology, individuals who develop intentions about a certain act are more likely to perform that act (Orbell et al., 1997). Ferreira Barbosa et al. (2021) have proven the influence of behavioural intentions on use behaviour but there is no evidence of this influence according to sociodemographic variables, namely, gender, age and academic qualifications and even less about the length of enrolment in the fitness centre, thus, the following hypotheses were postulated:

H1b: The influence of behavioural intentions to use the fitness centre app on use behaviour varies according to gender.

H2b: The influence of behavioural intentions to use the fitness centre app on use behaviour varies according to age.

H3b: The influence of behavioural intentions to use the fitness centre app on use behaviour varies according to academic qualifications.

H4b: The influence of behavioural intentions to use the fitness centre app on use behaviour varies according to time of registration.



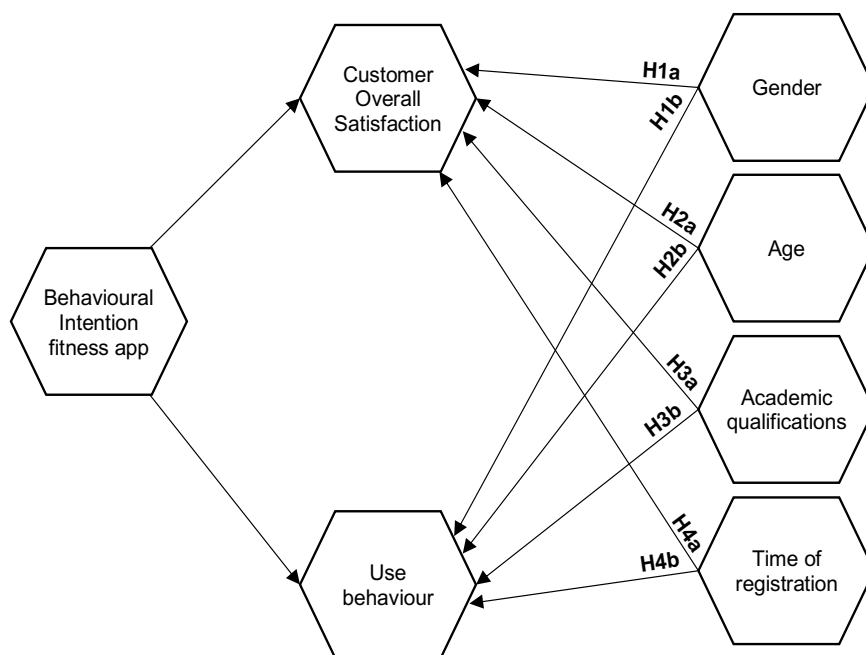


Figure 1. Research model.

4. Methodology.

4.1. Data collection.

In Portugal there is a great development of fitness centres apps. According to Pedragosa and Cardadeiro (2021), about 68% of fitness centres use these apps. In fact, the sample includes 1,678 consumers from Portuguese fitness centres. The *Associação de Ginásios e Academias de Portugal* (AGAP) was asked to collaborate in the data collection. In July 2020, AGAP contacted the fitness centres to present the basis and objectives of the study, send out our questionnaire and ask for it to be forwarded to the members. The data was collected between July and September 2020.

It was found that the number of female members (59%, n = 982) was higher than the number of male members (41%; n = 696). The age range that responded most to the questionnaire was 25-34 years (29%; n = 491) and 35-44 years (29%; n = 486). In terms of educational qualifications, 66% (n = 1101) of the affiliates



were found to have higher education. It was also found that 32% have been members of the fitness centre for more than four years and another 32% reported having been members for between two and three years. The majority of members (84%; n = 1403) reported using the fitness app, and these were the ones included in the final sample.

4.2. Measurement instrument.

An online questionnaire was used to collect information based on the UTAUT2 model, adapted to the particular context of this study. The questionnaire included 33 items. The price value variable was excluded, as the fitness app to be studied is made available to the fitness centre customers without any additional value. Four items were also added to the questionnaire to measure customer overall satisfaction (Based on Oliver (1997) and Cronin et al. (2000), adapted by García-Fernández et al. (2017)). All items are measured on a Likert scale (1-5). The questionnaire also includes socio-demographic and partner characterization questions. These variables were used as instrumental variables and control variables to test questions about common method bias and endogeneity.

4.3. Data analysis.

The software used for data analysis was SmartPLS 3.3.2 (Ringle et al., 2015). The measurement invariance of the composite models was tested through the three-step composite model measurement (MICOM) (Henseler et al., 2016). Subsequently, for the multi-group analysis, permutation was used and path coefficients for each variables relationship were compared.

The control variables age, academic qualifications and time of registration were regrouped and only two groups were created for each. Age was regrouped into participants aged under 25 years to 34 years (n = 569) and participants aged 35 years to over 55 years (n = 834). For the academic qualifications variable the groups of basic and secondary education were grouped (n = 464) and the group with higher education qualifications was maintained (n = 939). As for the time of registration, the groups of participants were grouped by those who were



registered between less than six months and one year (n = 494) and those registered between two years and more than four years (n = 909).

5. Results.

Before performing the group comparison, the measurement invariance of the three-step composite models (MICOM) was tested (Henseler et al., 2016). The MICOM procedure consists of three steps: (1) configural invariance (2) compositional invariance and (3) equality of mean values and composite variance values. According to Hair et al. (2018) to apply the MGA it is necessary to establish both configural invariance and compositional invariance to establish partial measurement invariance. To establish configural invariance each latent variable in the PLS-SEM model must be specified equally for all groups, ensuring, in this case, identical indicators for each measurement model, identical data treatment and identical algorithm configuration across all groups. In the appendix it is possible to find the tables (Table A, Table B, Table C, Table D, Table E, Table F, Table G, Table H) with the results of MICOM phase 2 and phase 3, for all four control variables. In step 2, if the correlation values are equal to or above the 5% quantile value, compositional invariance is verified (Hwa et al., 2020). In step 3, to achieve partial invariance, the values of the mean difference and variance difference should be between the 2.5% and 97.5% limits and, in that case, MGA can be performed (Hwa et al., 2020). For the multi-group analysis permutation was used and path coefficients were compared for each group. Group comparisons (Table 1, Table 2, Table 3, Table 4) allowed verification of group-specific differences.

Regarding step 2, since the correlation values are equal to or higher than the 5% percentile value for all constructs, compositional invariance was verified for all control variables (gender, age, academic qualifications and time of registration). For all the variables, in step 3, as there are constructs in which none of the values of the mean difference and variance difference are between the 2.5% and 97.5% limits, there is partial invariance, and AMS can be performed (Hwa et al., 2020).



In multigroup analysis, the final path coefficient values, indicate the most important constructs for each group and the p-value indicates whether the existing differences are significant or not. With regard to gender (Table 1), in terms of behavioural intentions to use the fitness app, performance expectancy and social influence were found to be significantly more important for men than for women. Effort expectancy, facilitating conditions, hedonic motivation and habit are significantly more important for women. The results also indicate that behavioural intentions towards the app influence men's overall satisfaction and app use behaviour more than women's. Still, as can be seen in Table 1, the p-values indicate that there are no significant differences between the groups ($p>0.005$). Only the relationship between weekly training frequency and use behaviour reveals a more significant difference between the two groups ($p=0.015$).

Table 1

Gender PLS-MGA results

		Path Coefficient		p-value
		Men	Women	
Behavioural intention	→ Overall satisfaction	0.570	0.493	0.108
Behavioural intention	→ Use behaviour	0.744	0.727	0.627
Performance expectancy	→ Behavioural intention	0.336	0.272	0.309
Effort expectancy	→ Behavioural intention	0.022	0.078	0.236
Social influence	→ Behavioural intention	0.119	0.048	0.093
Facilitating conditions	→ Behavioural intention	0.025	0.045	0.648
Hedonic motivation	→ Behavioural intention	0.060	0.081	0.671
Habit	→ Behavioural intention	0.450	0.494	0.343
Age	→ Overall satisfaction	-0.056	-0.079	0.638
Age	→ Use behaviour	-0.063	-0.005	0.095
Academic qualifications	→ Overall satisfaction	-0.019	-0.040	0.670
Academic qualifications	→ Use behaviour	0.058	0.075	0.634
Average weekly frequency of use	→ Overall satisfaction	-0.001	0.023	0.638
Average weekly frequency of use	→ Use behaviour	0.084	0.175	0.015
Time of registration	→ Overall satisfaction	-0.070	-0.061	0.835
Time of registration	→ Use behaviour	0.061	0.011	0.211

With respect to age (Table 2), the most important variables for the less than 25 to 34 years group are effort expectancy, social influence, hedonic motivation



and habit. The group 35 to over 55 years old values more in the app of fitness the aspects related performance expectancy and facilitating conditions. Behavioural intentions were also found to influence overall satisfaction and use behaviour more the youngest group than the oldest group. Even so, the p-values indicate that there are no significant differences between the groups in all relationships ($p > 0.005$), only the behavioural intentions to use the fitness app show significant differences relative to overall customer satisfaction ($p = 0.027$).

Table 2

Age PLS-MGA results

		Path Coefficient		p-value
		Less than 25 to 34 years	35 to more than 55 years	
Behavioural intention	→ Overall satisfaction	0.591	0.485	0.027
Behavioural intention	→ Use behaviour	0.736	0.730	0.874
Performance expectancy	→ Behavioural intention	0.232	0.343	0.063
Effort expectancy	→ Behavioural intention	0.094	0.032	0.190
Social influence	→ Behavioural intention	0.092	0.071	0.662
Facilitating conditions	→ Behavioural intention	0.031	0.046	0.743
Hedonic motivation	→ Behavioural intention	0.105	0.049	0.285
Habit	→ Behavioural intention	0.478	0.472	0.877
Gender	→ overall satisfaction	0.024	-0.018	0.400
Gender	→ Use behaviour	0.017	0.061	0.225
Academic qualifications	→ Overall satisfaction	-0.013	-0.050	0.425
Academic qualifications	→ Use behaviour	0.065	0.066	0.963
Average weekly frequency of use	→ Overall satisfaction	0.067	-0.020	0.059
Average weekly frequency of use	→ Use behaviour	0.159	0.132	0.464
Time of registration	→ Overall satisfaction	-0.072	-0.064	0.870
Time of registration	→ Use behaviour	0.045	0.019	0.478

In Table 3, as can be seen, for consumers with basic and secondary academic level the characteristics of performance expectancy and social influence are more important, or affect more, the intention to use the fitness centre app. In the same perspective, consumers with higher academic level value more aspects related to effort expectancy, facilitating conditions and habit. Behavioural intentions are shown to influence the overall satisfaction with the



fitness centre and the use behaviour of consumers with less academic qualifications more. However, the differences are not significant, since for all relationships the p-values are above 0.005. With regard to academic qualifications, the only significant differences arise in the relationships between age and time of registration with customer overall satisfaction ($p=0.025$ and $p=0.005$, respectively).

Table 3

Academic Qualifications PLS-MGA results

		Path Coefficient		p-value
		Basic and Secondary Education	Higher Education	
Behavioural intention	→ Overall satisfaction	0.568	0.509	0.249
Behavioural intention	→ Use behaviour	0.760	0.724	0.344
Performance expectancy	→ Behavioural intention	0.329	0.295	0.570
Effort expectancy	→ Behavioural intention	0.034	0.068	0.506
Social influence	→ Behavioural intention	0.084	0.074	0.825
Facilitating conditions	→ Behavioural intention	0.028	0.039	0.822
Hedonic motivation	→ Behavioural intention	0.060	0.073	0.820
Habit	→ Behavioural intention	0.465	0.479	0.733
Age	→ overall satisfaction	0.007	-0.103	0.025
Age	→ Use behaviour	-0.065	-0.019	0.213
Gender	→ Overall satisfaction	-0.009	-0.012	0.963
Gender	→ Use behaviour	0.022	0.057	0.364
Average weekly frequency of use	→ Overall satisfaction	0.013	0.014	0.982
Average weekly frequency of use	→ Use behaviour	0.102	0.162	0.122
Time of registration	→ Overall satisfaction	-0.162	-0.023	0.005
Time of registration	→ Use behaviour	0.078	0.008	0.072

Considering the time of registration (Table 4), for consumers registered for less time at the fitness centre (less than one year), with regard to the intention to use the app, performance expectancy and hedonic motivation are the most influential variables. Customers registered for longer (more than two years) value more aspects related to effort expectancy, social influence, facilitating conditions and habit. As can be seen in Table 4, it was found that behavioural intentions with the fitness centre app most influence the overall satisfaction and use behaviour of consumers who have been registered for less time at the fitness centre. The



p-values indicate, once again in this case, that there are no significant differences between the groups, with the exception of the relationship between academic qualifications and overall customer satisfaction ($p=0.042$).

Table 4

Time of Registration PLS-MGA results

		Path Coefficient		p-value
		Less than 6 months to 1 year	2 to more than 4 years	
Behavioural intention	→ Overall satisfaction	0.587	0.499	0.068
Behavioural intention	→ Use behaviour	0.757	0.719	0.317
Performance expectancy	→ Behavioural intention	0.335	0.293	0.524
Effort expectancy	→ Behavioural intention	0.044	0.062	0.698
Social influence	→ Behavioural intention	0.056	0.087	0.450
Facilitating conditions	→ Behavioural intention	0.018	0.044	0.538
Hedonic motivation	→ Behavioural intention	0.088	0.065	0.657
Habit	→ Behavioural intention	0.462	0.477	0.765
Age	→ overall satisfaction	-0.079	-0.054	0.610
Age	→ Use behaviour	-0.008	-0.048	0.281
Gender	→ Overall satisfaction	-0.029	0.009	0.476
Gender	→ Use behaviour	0.065	0.036	0.464
Average weekly frequency of use	→ Overall satisfaction	0.007	0.014	0.885
Average weekly frequency of use	→ Use behaviour	0.172	0.122	0.210
Academic qualifications	→ Overall satisfaction	-0.088	0.007	0.042
Academic qualifications	→ Use behaviour	0.093	0.041	0.147

6. Discussion and conclusions.

This study aimed to analyse whether the influence of behavioural intention to use the fitness centre app in the use behaviour and in overall customer satisfaction varies according the gender, age, academic qualifications and registration time. For that, a multigroup analysis was used through permutations within PLS-SEM.

In all four MGA carried out, although the influence of the constructs of UTAUT2 on behavioural intentions to use the fitness centre app varied between groups, it was found that, practically always, these differences were not



significant. This means that although the perceptions of the groups are different about the adoption of the app, the differences are not statistically significant.

The influence of behavioural intentions on both overall customer satisfaction and use behaviour is greater in males, in the youngest customers, those with lower academic qualifications and registered for less time at the fitness centre. Therefore, the results of this study proved our hypotheses, that there are differences in behavioural intentions to use the fitness centre app with overall customer satisfaction and use behaviour. Still, only in the relationship of behavioural intentions with overall satisfaction regarding age there were significant differences.

The results of this study do not corroborate that of Carroll et al. (2017) and Kontos et al. (2014), in health app users in the aspect of gender and education, which indicates that the main users of health apps were women and individuals who had more education. The results of our study also do not confirm those of McCully et al. (2013) regarding to education, which reported that users tended more educated. On the other hand, the three studies (Carroll et al., 2017; Kontos et al., 2014; McCully et al., 2013) confirm our results with regard to the age of the users, which are the youngest. Contrary to our results, it was also found in the Elavsky et al. (2017) study that women are more likely to use apps than men.

Reasons for educational differences may reflect skills and confidence with the use of technologies and possibly social norms related to perceived value. Similarly, the results with respect to age likely reflect both social norms and exposure during younger ages to mobile devices and apps. The results regarding age can also be explained according to the Bhuyan et al. (2016) report, which indicates that the probability of having an app decreases with increasing age from 35 years old onwards. The reasons for gender differences are less clear, but may reflect differences in training behaviour and interest and participation in fitness centre activities in general. The conclusions regarding the time of registration are also unclear, but they are probably associated with a greater need to use the app by members registered for less time to consult information about the fitness centre or even for the reason that in an initial phase they need to dedicate a little more time to exploring the app.



With this study, it was also found that men value more the ease of use aspects of the app, the facilitating conditions and aspects related to the habit, for the behavioural intention to use, than women. It was also found that younger consumers value aspects related to effort expectancy, social influence, hedonic motivation and habit more than consumers over 35 years of age. For consumers with lower academic qualifications, aspects of performance expectancy and social influence are more relevant to the behavioural intention than for consumers with higher academic qualifications. It was also noted that for consumers registered for a shorter period of time, performance expectancy and hedonic motivation influences behavioural intentions more than for those registered for a longer period of time.

6.1. Theoretical and practical implications.

The findings provide evidence for gender, age, educational and time of registration differences in the use of fitness centre apps. Although the influence of behavioural intentions on usage behaviour and overall customer satisfaction has already been studied, there is no evidence on the differences between the groups regarding sociodemographic issues and time of registration in the fitness centre. Thus, this is considered a theoretical contribution of this study.

Understanding the aspects most valued by consumers in the adoption of fitness centre app according to their characteristics allows improving the design of the service offer and therefore improving consumer satisfaction with the service and the brand. Also, it is considered that app designers should incorporate user profiles in the design of fitness apps to facilitate tailoring of app features to maximize their effectiveness as well as minimize any possible negative impact on users with different predispositions and consider the underlying psychological needs of users.

6.2. Limitations and future research.

In conducting this study some limitations were encountered. First, the scarcity of studies involving fitness apps, specifically fitness centre apps, limited



the conclusions. Another limitation relates to the characteristics of the study, namely the fact that it is a cross-sectional study and the fact that it was only applied in Portugal. Therefore, it is recommended as future research to replicate this research in other countries, comparing the results between them. Because the type of MGA used does not consider the model in its entirety, it would be interesting to compare these results with an analysis of the entire model (Klesel et al., 2019). In order to analyze possible differences, it is suggested that future research use an analysis that allows this evaluation, comparing with the results of this study.

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Appendix

Table A

Gender: Results of MICOM Phase 2

Construct	Group	Composite invariance		
		Correlation score	5% quantile	Verified
Behavioural intention		1.000	1.000	Yes
Performance expectations		1.000	1.000	Yes
Expectation of effort		1.000	1.000	Yes
Social influence		1.000	0.999	Yes
Facilitating conditions		0.997	0.996	Yes
Hedonic motivation		1.000	1.000	Yes
Habit	Men VS Women	1.000	1.000	Yes
Overall satisfaction		1.000	0.999	Yes
Use behaviour		1.000	1.000	Yes
Age		1.000	1.000	Yes
Academic qualifications		1.000	1.000	Yes
Average weekly frequency of use		1.000	1.000	Yes
Time of registration		1.000	1.000	Yes



Table B

Gender: Results of MICOM Phase 3

Construct	Equality of composite values					
	Mean value			Variance values		
	Mean diff.	2.5-97.5%	Verified	Log. var ratio	2.5-97.5%	Verified
Behavioural intention	-0.272	[-0.115-0.112]	No	0.273	[-0.171-0.155]	No
Performance expectations	-0.303	[-0.110-0.109]	No	0.234	[-0.183-0.166]	No
Expectation of effort	-0.260	[-0.117-0.114]	No	0.235	[-0.267-0.245]	Yes
Social influence	-0.064	[-0.110-0.115]	Yes	0.090	[-0.121-0.117]	Yes
Facilitating conditions	-0.235	[-0.108-0.108]	No	0.234	[-0.246-0.222]	No
Hedonic motivation	-0.129	[-0.113-0.101]	No	0.094	[-0.141-0.119]	Yes
Habit	-0.234	[-0.109-0.104]	No	0.138	[-0.143-0.140]	Yes
Overall satisfaction	-0.139	[-0.106-0.108]	No	0.065	[-0.167-0.154]	Yes
Usage behaviour	-0.259	[-0.107-0.114]	No	0.231	[-0.209-0.187]	No
Age	0.230	[-0.115-0.110]	No	0.065	[-0.128-0.121]	Yes
Academic qualifications	-0.196	[-0.110-0.114]	No	0.159	[-0.167-0.157]	No
Average weekly frequency of use	0.382	[-0.105-0.113]	No	-0.306	[-0.124-0.118]	No
Time of registration	-0.027	[-0.112-0.112]	Yes	-0.051	[-0.111-0.108]	Yes

Table C

Age: Results of MICOM Phase 2

Construct	Group	Composite invariance		
		Correlation score	5% quantile	Verified
Behavioural intention		1.000	1.000	Yes
Performance expectations		1.000	1.000	Yes
Expectation of effort		1.000	1.000	Yes
Social influence		1.000	0.999	Yes
Facilitating conditions	Less than 25 to 34 years VS 35 to more than 55 years	0.996	0.996	Yes
Hedonic motivation		1.000	1.000	Yes
Habit		1.000	1.000	Yes
Overall satisfaction		1.000	0.999	Yes
Use behaviour		1.000	1.000	Yes
Gender		1.000	1.000	Yes
Academic qualifications		1.000	1.000	Yes
Average weekly frequency of use		1.000	1.000	Yes
Time of registration		1.000	1.000	Yes



Table D

Age: Results of MICOM Phase 3

Construct	Equality of composite values			Variance values		
	Mean values			Log. var		
	Mean diff.	2.5-97.5%	Verified	ratio	2.5-97.5%	Verified
Behavioural intention	-0.011	[-0.105-0.107]	Yes	-0.011	[-0.169-0.160]	Yes
Performance expectations	-0.039	[-0.107-0.101]	Yes	0.030	[-0.184-0.166]	Yes
Expectation of effort	0.105	[-0.113-0.115]	Yes	-0.053	[-0.252-0.246]	Yes
Social influence	0.144	[-0.110-0.115]	No	-0.178	[-0.131-0.117]	No
Facilitating conditions	0.187	[-0.111-0.105]	No	-0.229	[-0.255-0.222]	Yes
Hedonic motivation	0.104	[-0.106-0.106]	Yes	-0.071	[-0.132-0.125]	Yes
Habit	0.058	[-0.109-0.109]	Yes	-0.125	[-0.140-0.136]	Yes
Overall satisfaction	0.151	[-0.107-0.103]	Yes	-0.008	[-0.174-0.172]	Yes
Use behaviour	0.039	[-0.107-0.110]	Yes	-0.087	[-0.209-0.180]	Yes
Gender	0.237	[-0.103-0.103]	No	-0.126	[-0.051-0.047]	No
Academic qualifications	-0.022	[-0.106-0.114]	Yes	0.013	[-0.58-0.152]	Yes
Average weekly frequency of use	0.074	[-0.111-0.111]	Yes	-0.074	[-0.128-0.110]	Yes
Time of registration	-0.502	[-0.106-0.109]	No	0.095	[-0.109-0.102]	Yes

Table E

Academic Qualifications: Results of MICOM Phase 2

Construct	Group	Composite invariance		
		Correlation score	5% quantile	Verified
Behavioural intention		1.000	1.000	Yes
Performance expectations		1.000	1.000	Yes
Expectation of effort		1.000	1.000	Yes
Social influence		0.999	0.999	Yes
Facilitating conditions		0.999	0.995	Yes
Hedonic motivation	Basic and secondary education VS Higher education	1.000	1.000	Yes
Habit		0.999	1.000	Yes
Overall satisfaction		1.000	0.999	Yes
Use behaviour		1.000	1.000	Yes
Age		1.000	1.000	Yes
Gender		1.000	1.000	Yes
Average weekly frequency of use		1.000	1.000	Yes
Time of registration		1.000	1.000	Yes



Table F

Academic Qualifications: Results of MICOM Phase 3

Construct	Equality of composite values					
	Mean values			Variance values		
	Mean diff.	2.5-97.5%	Verified	Log. var ratio	2.5-97.5%	Verified
Behavioural intention	0.063	[-0.104-0.108]	Yes	0.020	[-0.190-0.171]	Yes
Performance expectations	0.071	[-0.113-0.107]	Yes	-0.041	[-0.188-0.170]	Yes
Expectation of effort	0.017	[-0.118-0.112]	Yes	-0.056	[-0.273-0.249]	Yes
Social influence	0.302	[-0.109-0.110]	No	-0.034	[-0.136-0.122]	Yes
Facilitating conditions	-0.151	[-0.118-0.109]	No	0.383	[-0.267-0.238]	No
Hedonic motivation	0.323	[-0.117-0.116]	No	-0.020	[-0.146-0.130]	Yes
Habit	0.077	[-0.106-0.105]	Yes	0.113	[-0.156-0.152]	Yes
Overall satisfaction	0.103	[-0.109-0.113]	Yes	0.069	[-0.193-0.176]	Yes
Use behaviour	-0.107	[-0.107-0.105]	Yes	0.125	[-0.214-0.201]	Yes
Gender	-0.148	[-0.113-0.107]	No	0.127	[-0.118-0.117]	No
Academic qualifications	-0.208	[-0.122-0.110]	No	0.083	[-0.057-0.050]	No
Average weekly frequency of use	0.085	[-0.114-0.111]	Yes	-0.104	[-0.126-0.119]	Yes
Time of registration	-0.438	[-0.122-0.109]	No	0.109	[-0.105-0.109]	Yes

Table G

Time of Registration: Results of MICOM Phase 2

Construct	Group	Composite invariance		
		Correlation score	5% quantile	Verified
Behavioural intention		1.000	1.000	Yes
Performance expectations		1.000	1.000	Yes
Expectation of effort		1.000	1.000	Yes
Social influence		1.000	0.999	Yes
Facilitating conditions	Less than 6 months to 1 year VS 2 to more than 4 years	0.999	0.996	Yes
Hedonic motivation		1.000	1.000	Yes
Habit		1.000	1.000	Yes
Overall satisfaction		1.000	0.999	Yes
Use behaviour		1.000	1.000	Yes
Age		1.000	1.000	Yes
Gender		1.000	1.000	Yes
Average weekly frequency of use		1.000	1.000	Yes
Academic qualifications		1.000	1.000	Yes



Table H

Time of Registration: Results of MICOM Phase 3

Construct	Equality of composite values					
	Mean values			Variance values		
	Mean diff.	2.5-97.5%	Verified	Log. var ratio	2.5-97.5%	Verified
Behavioural intention	0.028	[-0.112-0.101]	Yes	0.103	[-0.181-0.167]	Yes
Performance expectations	0.043	[-0.116-0.105]	Yes	0.039	[-0.183-0.181]	Yes
Expectation of effort	0.035	[-0.108-0.100]	Yes	0.079	[-0.243-0.251]	Yes
Social influence	0.286	[-0.110-0.106]	No	-0.049	[-0.134-0.122]	Yes
Facilitating conditions	0.085	[-0.112-0.108]	Yes	0.045	[-0.254-0.227]	Yes
Hedonic motivation	0.254	[-0.112-0.101]	No	0.038	[-0.145-0.135]	Yes
Habit	0.069	[-0.113-0.105]	Yes	0.143	[-0.155-0.144]	Yes
Overall satisfaction	0.183	[-0.113-0.101]	No	0.045	[-0.178-0.171]	Yes
Use behaviour	-0.073	[-0.118-0.099]	Yes	0.193	[-0.199-0.195]	Yes
Gender	-0.562	[-0.107-0.112]	No	0.106	[-0.131-0.113]	Yes
Academic qualifications	-0.012	[-0.102-0.110]	Yes	0.006	[-0.056-0.045]	Yes
Average weekly frequency of use	0.041	[-0.119-0.107]	Yes	-0.065	[-0.123-0.117]	Yes
Academic qualifications	-0.414	[-0.110-0.105]	No	0.356	[-0.152-0.154]	No



Chapter VII: Conclusions

This chapter will present the main conclusions of each study and an overall conclusion. The practical and theoretical implications as well as the limitations of the study and suggestions for future lines of research will also be presented.

1. Conclusions

The conclusions of this work can be divided into three parts, 1) conclusions of the first article “The influence of technologies and other variables on the retention of members in gyms: systematic review”, 2) conclusions of the second article “The use of fitness centre apps and its relation to customer satisfaction: A UTAUT2 perspective” and 3) conclusions of the third article “Behavioural intentions, use behaviour of the fitness centre app and customer overall satisfaction: A multigroup analysis”.

1) Technology and social networks are increasingly becoming indispensable tools in all sectors, of which the fitness industry is no exception. In order to adapt and keep up with this evolution, but also to try to increase the level of satisfaction and retention of members, fitness centres are increasingly incorporating technological innovation services (virtual classes, WFT, on-demand, fitness apps) into their institutions in a variety of ways. The first research included in this study aimed to understand the influence of the use of technologies and social networks on customer retention, through a systematic review of the literature. The search was conducted using the PRISMA method in 4 databases (Web of Science, Scopus, EBSCO and PubMed) from January 2011 to December 2019. The main categories of search terms were: 1) "retention" (fidelity, loyalty, adherence), 2) "health fitness club" (fitness centre, health club, gymnasium), 3) "technology" (social networks, mobile phone, smartphone, app, Facebook, twitter, Instagram, gamification). This first study identified that not only social networks and technologies positively influence customer retention, but also other factors such as the personal characteristics of the members, frequency and time of use, quality of service and customer satisfaction with the fitness centre. Thus, it was also found that studying satisfaction helps us to understand retention



behaviours and, as previously studied, increasing customer retention is critical for business profitability. As a result, this study emphasizes the significance and impact that social networks and technologies can have on customer retention, and it opens the door for further and more in-depth research in this area.

The first article's conclusions boil down to two points:

- Social networks and technologies have a positive impact on customer retention;
- Customers' personal characteristics, frequency and time of use, service quality, and customer satisfaction with the fitness centre were also found to influence retention. As a result, satisfaction aids in understanding retention behaviours. Both of these findings led to the second article, as well as preliminary research that demonstrated the gap in studies on the fitness centre app. It was decided to study the intention to use fitness apps, specifically the fitness centre app, and the relationship of their use with customers' overall satisfaction with the fitness centre.

2) For the second study it was used the extended unified theory of acceptance and use of technology, the UTAUT2 (Venkatesh et al., 2012). With this study it was found that the majority of the app users were female. It was also concluded that the majority were between 25 and 44 years of age. With regard to academic qualifications, it was concluded that the majority of the sample had a higher education. These results are in line with others on fitness apps in general (Purcell, 2011) and mobile health applications (Krebs & Duncan, 2015) which indicate that mobile app users tend to be young and have above average education. Lisbon was the district of residence of the majority of the participants, followed by Porto, Setubal and Beja. These data are in line with the distribution of the population in Portugal (Pedragosa & Cardadeiro, 2021). As to the weekly training frequency and time of registration in the fitness centre, it was also concluded that most of the participants in this study attend the fitness centre more than 5 times a week and are registered from two to more than four years in the fitness centre.

The data collected made it possible to analyse the profile of the fitness centre applications users. The app of the fitness centre is more frequently used



by women and by users aged between 25 and 54. On the other hand, it was the users with basic academic level who indicated the most frequent use of the app. It was also concluded that the members who train most often in the fitness centre per week are the ones who indicated the most frequent use of the app. Interestingly, the members who indicated the most use of the fitness centre app are those who have been registered less than six months or more than two years. Regarding the behavioural intentions to use the app in relation to the characteristics of the participants, it was also found that it is women and participants with lower academic qualifications who showed the greatest intention to use these apps. On the contrary, this intention of use indicated to be superior in participants who are over 45 years old, who attend little the fitness centre and those who have been registered for less time. It was verified that use behaviour was positively correlated with behavioural intentions. These results are in line with those of Byun et al. (2018) that indicates the intention to use positively influences use behaviour. In their study Nair et al. (2015) also verified that use behaviour depends on the intention to use.

The results support the ability of the purposed model, UTAUT2, in predicting the customer's intention to use the fitness app. The results therefore indicate that both 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 with behavioural intentions. This indicates that the fact that customers consider that using the app will help improve their performance at the institution (performance expectancy) and that the habit/desire/addiction to use the app (habit) will contribute to behavioural intentions to use the fitness centre app.

Through this study it was also found that behavioural intentions influence both the use behaviour of the fitness centre app and the customer's overall satisfaction with the fitness centre, proving the influence of the use of this technology in customer satisfaction and thus highlighting the importance of its use for managers. As for the features most valued by members regarding the use



of the fitness centre app it was found that the most valued features are Clarity of Apps; Ease of use; Apps being fun.

The analysis also highlights the indicator that most influences customer overall satisfaction: happiness regarding the fitness centre's programmes and services, which is also in line with the findings of the first study, positive perceptions of service quality lead to greater member satisfaction and, in turn, retention. This study revealed a high usage of these app by members of Portuguese fitness centres, around 84% of members use their fitness centre's app and of these, 66% use it frequently. This finding is important since the behavioural intention of use has a positive relationship with the customer's overall satisfaction with the fitness centre. The findings revealed the impact of control variables (age, gender, academic qualifications, weekly training frequency, and time of registration) on use behaviour and customer satisfaction.

The second study yielded three major conclusions:

- Although performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, and habit all have a positive impact on behavioural intentions to use the fitness centre app, performance expectancy and habit have the strongest relationships.

- Behavioural intentions are positively related to both fitness app use behaviour and overall customer satisfaction;

- The app use behaviour and overall satisfaction with the app are influenced by control variables (age, gender, and academic qualifications, weekly training frequency, and time of registration). This final conclusion prompted the third article.

3) With the aim of analysing whether there were significant differences in the use of fitness centre apps, and in customer overall satisfaction, in relation to age, gender, academic qualifications, training frequency and registration time. For that, a multigroup analysis was used. After this analysis, it was found that the perceptions of the groups are effectively different about the adoption of the fitness centre app. There are differences in the behavioural intentions to use the app in the fitness centre with the customer overall satisfaction and use behaviour, in relation to the characteristics of the customers. Still, only in the relationship of



behavioural intentions with overall satisfaction in relation to age were there significant differences. The influence of behavioural intentions on both customer overall satisfaction and use behaviour is greater in men, younger customers, those with less academic qualifications and those who have enrolled for less time in the fitness centre. With this study, it was also found that men value the aspects of the app's ease of use, facilitating conditions and habit-related aspects more than women. Younger customers value the aspects related to effort expectation, social influence, hedonic motivation and habit more than customers over 35 years of age. Performance expectancy and social influence are more important for customers with lower academic degrees than they are for customers with higher academic qualifications in terms of behavioural intention. Performance expectancy and hedonic motivation influence behavioural intentions more for customers who have been registered for a shorter length of time than for those who have been registered for a longer period of time.

Two main results were drawn from the third study:

- The impact of behavioural intentions on customer overall satisfaction and use behaviour varies by age, gender, academic qualifications and time of registration;
- The influence of behavioural intentions on customer overall satisfaction and use behaviour is higher among male gender, younger customers, those with lower academic qualifications and those who have been registered for less time in the fitness centre.

The overarching goal of this dissertation is to investigate the use of fitness centre apps and their impact on customer satisfaction and retention. Thus, it was discovered that fitness centres increasingly bet on the use of innovative technologies, such as the use of fitness apps, to improve the quality of services and differentiate themselves from the competition, thereby increasing customer overall satisfaction. As previously stated, one of the major determinants of customer overall satisfaction is satisfaction with service quality (Eskiler & Altunışık, 2021; Ferreira Barbosa et al., 2019; Pradeep et al., 2020; Rahmatulloh & Melinda, 2021; Zeithmal et al., 2011). In this regard, it was discovered that the use of apps in fitness centres increases customer overall satisfaction and, as a



result, retention (Bodet, 2006; Bolton, 1998; IHRSA, 2017; Nikhashemi et al., 2013; Oliver, 1999; Pradeep et al., 2020; Rahmatulloh & Melinda, 2021; Rust et al., 1995).

The issue of physical inactivity was also addressed in the introduction to this dissertation. In this sense, this study also emphasizes the significance of using fitness centre apps to increase physical activity, as the findings show that frequent use of the fitness centre app is associated with a higher weekly training frequency. Thus, it is possible to conclude that the use of the fitness centre app is beneficial for the customer in terms of health, as it increases the practice of physical activity, and for the centre in terms of customer satisfaction, which may lead to higher levels of retention, improving the company's profitability. As a result, the use of these apps increases the practice of physical activity, improving both the health of customers and the "health" of the company, from the standpoint that if customers go more, they improve their health and remain customers, contributing to the retention rate.

1.2. Practical and theoretical implications.

The practical and theoretical implications can be divided, taking into account the three articles developed.

1) The systematic review reinforces the theoretical importance not only of the study of technologies for customer retention in the fitness context but also of other factors that should be valued (for example: personal characteristics of the members, frequency and time of registration, quality of service and customer satisfaction). By addressing variables that affect customer retention, this study does not fail to reveal its practical implications for the managers of these organisations.

2) As for the study of fitness centre apps, despite the various existing studies on the use of fitness apps, there are no studies in the literature that refer to the use of fitness centre apps specifically, let alone the differences in use with regard to customer characteristics. This is therefore a theoretical contribution of the second study. Furthermore, the results contribute to the sports and marketing



literature on the UTAUT2 model by adding another measure, customer overall satisfaction. Since it has been proven that these apps are widely used by members and that they contribute to their overall satisfaction with the fitness centre, fitness centre managers should invest in their acquisition by selecting the application according to the characteristics of their members.

3) The results of the third study provide information on the use of fitness apps in fitness centres, as well as evidence of differences in gender, age, education and registration time in the use of these apps. The fact that fitness centre apps are used more by the younger population also provides designers with useful information, as it suggests that apps should be improved to be more intuitive and easier to use by the senior population.

Smartphones are predicted to be used by 3.8 billion people worldwide in 2021, accounting for 48.46% of the world's population (Statista, 2021). In addition, the number of fitness app downloads is steadily increasing (Clement, 2020). Furthermore, the findings of this survey suggest that members utilize fitness applications on a regular basis. Given the popularity of apps, it is recommended that fitness centres invest in the use of a good one, as their use is linked to overall customer happiness and, thus, retention, which benefits the fitness centres. The app's use varies depending on the customer's qualities, which must be taken into account while acquiring an app. This conclusion also provides information to the designers of these apps, highlighting the features that users value the most when adopting the app based on their preferences. Using the fitness app, the fitness centre may interact with members more effectively and efficiently. As a result, the member establishes a stronger connection with the brand and its employees. Using fitness centre apps has a favourable influence on both clients and fitness centres, according to the conclusions of this study. Customers gain a positive social impact as a result of having access to a product (fitness app) that promotes health by increasing physical activity. Customers that use the app have greater control over how they access the fitness centre's services and goods, as well as more information. I'd venture to claim that the convenience it gives increases clients' quality of life.



From the perspective of the businesses, the adoption of fitness centre apps helps them to stay afloat financially. The consumer base grows as a result of the app.

1.3. Limitations and future research.

The limitations and future lines of research can be divided into two parts, the limitations of the systematic review and the limitations of cross-sectional studies, since the limitations of both of these latest articles are related, above all, to limitations of existing studies on the topic of fitness centre apps or the methodology used, which was similar.

1) As for conducting the systematic review, the main limitations were related to the fact that there were not many studies included in the final review, despite the fact that the search terms were carefully chosen according to the main theme of the study. Second, the study was only related to the opinion of three reviewers. As a third limitation, the fact that the sociodemographic differences of the population of the different studies were not considered. As a future line of research for the first study, it is suggested to integrate the different perspectives of quality (organisation and customer) related to the use of technologies and how this use would influence customer retention. It is important to understand that the creation of organisation value should be guided by the value perceived by customers (Landroguéz et al., 2013). It is therefore important to distinguish what the organisation perceives as quality, but mainly the customer's perception of quality of the services offered by the company. This is because satisfaction (and consequently retention) is highly dependent on members' expectations about the service (Pedragosa, 2021b).

2) The conduct of the statistical analysis studies also had some limitations. Firstly, the fact that there are few studies based on UTAUT2 to analyse the intention to use fitness apps, specifically fitness centre apps. Secondly, the fact that the study was cross-sectional, despite the assumed difficulty in conducting a longitudinal study using a large number of fitness centres. Thirdly, the study was only conducted in Portugal, so the results may not be generalisable to other



countries with different cultures. In the second study, one of the limitations found was related to the fact that the intentions of using the app according to the customers' characteristics were not considered, a limitation that was overcome in the third study.

As future lines of research, it is recommended the reproduction of the studies in other countries, such as Spain, comparing the results obtained with this study. For the MGA, it would be interesting to compare these results with an analysis with the whole model (Klesel et al., 2019), since the type of MGA used does not consider the model in its entirety. As a future research, it is suggested to use an analysis that allows this evaluation, comparing with the results of this study, in order to analyse possible differences.

In general, the limitations of this work are related to weaknesses in the research derived from initial inexperience that were overcome with the help and experience of the tutors and with the completion of papers for conferences, namely participation in the *TAPAS Conference 2020* and the *XI Congreso Iberoamericano de Economía del Deporte*, as well as a 3-month stay at the Universidade Autónoma de Lisboa. Another limitation is related to the initial unfamiliarity with the SmartPLS analysis software, which was overcome with two training courses, *Modelos de ecuaciones estructurales basados en la varianza: partial least squares (PLS) para investigadores en ciencias sociales (online)* and *PLS-SEM Desarrollos Avanzados*, as well as participation in the course *Explanation and Prediction in Business Research: The Example of PLS-SEM*, all developed by the Seville University.

As mentioned, in the future it is intended to follow up on these studies, with the application of a new method of multi-group analysis, proposed by Klesel et al. (2019).



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Appendix A: Project timeline

Tasks	2019			2020												2021							
	Oct	Nov	Dec	Jan	Feb	Sea	Apr	May	Jun	Jul	Ag	Sep	Oct	Nov	Dec	Jan	Feb	Sea	Apr	May	Jun	Jul	
1. Drafting and presentation of article 1 - <i>Influência das redes sociais e tecnologias na retenção de sócios em ginásios: revisão sistemática</i>	█	█	█	█	█																		
2. Authorisations and logistics for Article 2 participation				█	█																		
3. Preparation of the 2nd article - <i>The use of fitness apps and its relation to customer satisfaction - A UTAUT2 perspective</i>					█	█	█	█	█														
4. Preparing the questionnaire for Google Forms									█														
5. Implementation of the questionnaire										█	█	█											
6. Participation in the <i>European Sport Management Virtual Conference</i>												█											
7. Analysis of the data collected												█	█	█	█								
8. Participation in the training course "Variance-based structural equation modelling: partial least squares (PLS) for social science researchers (online)".													█										
9. Submission of an oral communication to be presented at the <i>TAPAS Conference 2020</i>														█									
10. Submission of the 2nd article - <i>The use of fitness centre apps and its relation to customer satisfaction - A UTAUT2 perspective</i>																█	█	█					
11. Preparation and submission of a study <i>The use behaviour and behavioural intentions of fitness apps in Portuguese fitness centres</i> to WASM Book Marketing.																█	█	█					
12. Participation in the training course "PLS-SEM Advanced Developments".																	█						
13. Participation in the training "Explanation and Prediction in Business Research: The Example of PLS-SEM".																	█						
14. Preparation and submission of the 3rd article.																	█	█	█	█			
15. Elaboration of an oral communication to present at CIED11.																	█	█	█	█			
16. International stay at the Universidade Autónoma de Lisboa (Publication in the AGAP journal and Webinar).																		█	█	█	█		
17. General discussion and conclusion of the doctoral thesis.																					█	█	



Appendix B: Questionnaire

Items	References
Performance expectancy	
1. I find the fitness app of my fitness centre useful.	Venkatesh et al. 2012
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.	
Effort expectancy	
1. Learning to use my fitness app is easy.	Venkatesh et al. 2012
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.	
Social influence	
1. People who are important to me think I should use the fitness app.	Venkatesh et al. 2012
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.	Nair, Ali and Leong, 2015
Facilitating conditions	
1. I have the resources necessary to use the fitness app.	Venkatesh et al. 2012
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.	
Hedonic motivation	
1. Using the fitness app is fun.	Venkatesh et al. 2012
2. Using the fitness app is enjoyable.	
3. Using the fitness app is very entertaining.	

(Continued on next page)



Habit

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- 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. Venkatesh et al. 2012
 - 4. Using the fitness app has become natural to me.

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. Based on Zeithaml et al. 1996, adapted by
 - 3. I plan to continue to use the fitness app frequently. Venkatesh et al. 2012
 - 4. I intend to make positive comments about the fitness app to other people.

Use behaviour

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- 1. I use the fitness app frequently. Venkatesh et al. 2012

Customer overall satisfaction

-
- I am satisfied with the programs and services of this fitness centre. Based on Oliver 1997
 - I am happy with the programs and services of this fitness centre. and Cronin et al.
 - I am pleased to have taken the decision to become a member of this fitness centre. 2000, adapted by
 - My decision to be a member of this fitness centre was successful. García-Fernández et al. 2017
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