VILNIUS UNIVERSITY

FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION

MARKETING AND INTEGRATED COMMUNICATIONS

Anna Shklyaeva

MASTER THESIS

THE IMPACT OF GAMIFICATION ON RELATIONSHIP BETWEEN HEALTH BELIEF, HEALTH CONSCIOUSNESS AND INTENTION TO USE CONTINUOUSLY MOBILE FITNESS APPLICATIONS

GEIMIFIKACIJOS POVEIKIS RYŠIUI TARP ĮSITIKINIMŲ APIE SVEIKATĄ, SVEIKATOS SĄMONINGUMO IR KETINIMO NAUDOTI MOBILIAS FITNESO PROGRAMĖLES

Supervisor: **Ignas Zimaitis**
Student: **Anna Shklyaeva**

Date of submission of Master Thesis: 15.01.2023

Vilnius, 2023

The declaration that the thesis complies with the requirements set out by Vilnius University

I, _____, hereby confirm that:

The literature and reference lists include all references referenced in the work, whether they are cited directly or indirectly. In addition, the paper submitted to the students' database information system at Vilnius University is an exact replica of the document given to the marketing department. Lastly, the development of this thesis did not infringe on any laws or intellectual property rights.

Signature of Student: _____

Date:

TABLE OF CONTENTS

INTRODUCTION

Today the world has been facing major health challenges such as contaminated water, malnutrition and pollution; these risks have been created by the modern world itself (Schweitzer and Noblet, 2018). Nowadays, the global risk for chronic diseases such as high blood pressure, use of tobacco, sugar, physical inactivity, high cholesterol level are directly caused by modern lifestyles having sedentary, high-stress levels, and frequent intake of food having high calories and recreational narcotics (Stevens, Mascarenhas and Mathers, 2009). On practical grounds, rehabilitative workouts, medication routine, physical activity, recreational drugs usage are major causes of directly affecting various modern lifestyle health risks (Glanz, Rimer and Viswanath, 2008). A major portion of health care costs (approximately three quarters) is linked to chronic disease as they are caused by bad health behaviors (Krist et al., 2008). To change the behavioral attributes, the only tool is effective management which must be adopted by patients to align their health activities (Teixeira et al., 2012). A new revolutionized trend is set by fitness apps providers through which they build a strong relation with consumers by providing customized fitness services (Pereira et al., 2014). These latest communication ways and tools have a great impact on the way organizations interact with the consumers, with the support of the latest researches, which evaluates the consumers' interest and motivation towards adopting these devices, their perception towards benefits of app usage, and their intention to adopt this latest trend in different areas (McClain and McLelland, 2008; Stocchi, Michaelidou and Micevski, 2019).

Motivation of the individual person is the key and prominent force behind behavioral change, which further shapes the health behavioral changes (Glanz and Bishop, 2010). Despite many other studies related to miscellaneous motivational structures and practices that govern and energize behavior. Precisely, all techniques established for changing the established behavior are centralized around motives (Michie, van Stralen and West, 2011).

As per self-determination theory (SDT) presented by Deci and Ryan (2012), there is no similarity among different motivational categories. This idea forms the basis of further two main theories: intrinsic motivation theory and extrinsic motivation theory. The concept of Intrinsic motivation focuses on such activities that have been performed "for their own sake", which satisfied internal needs that are directly linked to psychological needs such as power, autonomy, relatedness and competence, which further fosters the feeling of willingness, violation of rules or enjoyment (Deci and Ryan, 2010). Extrinsic motivation can be defined as any activity that has been performed in order to gain some external rewards such as fame,

power, money and avoiding negative consequences (Bénabou and Tirole, 2003). Moreover, goals are directly aligned with outcomes instead of satisfying psychological needs (Deci & Ryan, 2012). Now, SDT theory has been considered as a widely spread framework for evaluating health behavior interventions. A number of earlier researchers, i.e., (Fortier et al., 2012; Patrick and Williams, 2012; Teixeira et al., 2012), compared the intrinsic motivation theory and extrinsic motivation theory to find out the effectiveness of these in driving the need for using products. However, out of these two types of motivation, intrinsic motivation is more effective as it plays an important role for mental and social well-being and also motivates intrinsic behaviors that are closely related to psychological needs (Ryan, Huta and Deci, 2008).

The prominent factor for behavioral change is motivation and the desire to use fitness products that are highly dependent on behavioral change in this modern life. To govern the need for intention to use fitness products, an intrinsically motivated behavioral change is highly desirable. To achieve the primary need of satisfaction, a prompt question of what types of interventions are best allocated arises (Przybylski, Rigby and Ryan, 2010; Tamborini et al., 2011; Mekler et al., 2014). The practice of changing health communication or behavior into games might thus be a beneficial route for intrinsic motivation of a user so that an exposing and continuous engagement with these programs of a user can be achieved (Baranowski et al., 2008; Wouters et al., 2013).

Therefore, gamification is used in various sectors to increase customer engagement (Martí-Parreño, Galbis-Córdova and Currás-Pérez, 2021). With the increase in the trend of health consciousness, gamification has a significant influence on customer behavior when it comes to purchasing fitness-related items such as exercise machines, purchasing apps etc., by explaining the features and their importance through visual assistance (Schmidt-Kraepelin et al., 2020).

In addition to this, gamification is considered a powerful strategy to improve human performance, construct healthy behavior, and increase intrinsic motivation to use fitness products (Alsawaier, 2018). Furthermore, Jones, Smith and Llewellyn (2014) defined health belief as what elements people perceive and believe constitute their health and what element makes them healthy and what causes them ill, and in what ways they perceive can help them overcome their illness. For instance, elements can be nutrition, weight manipulation, medication or exercise (Pereira et al., 2014).

Johnsona et al. (2016) further investigated health belief in his research by performing meta-analysis, and his findings explained that game-making has a strong relationship with health belief. The author defined health belief as an individual's psychological behavior towards perceiving the health, and his findings further explained four constructs that shapes health belief, i.e. perceived susceptibility-personal vulnerability towards illness, perceived severity-seriousness towards illness, and perceived benefit- individuals' intention toward considering the action as beneficial, cue to action- stimulus that triggered the health action (Johnsona et al., 2016). Thus, the purpose of this study is to determine the effect of health beliefs on the intention to utilize a fitness product.

Besides, people are more concerned about their health nowadays. The concept of health consciousness is discussed by Hong; one's a mental orientation towards his health that pertains to awareness towards self-health or the personal responsibility he perceives towards his health and motivation to maintain health in a proper manner (Hong, 2009). Furnham and Forey (1994) further explained that health depicts various health attitudes as well as behaviors. This claim was further supported by Iversen and Kraft (2006), in which they demonstrated through their study that health consciousness has more probability of shaping health-promoting behavior, for instance, exercise, healthy diet etc. Moreover, it was also observed through research that health consciousness has a close relationship with individuals' ability and interest to respond to health information (Basu and Dutta, 2008). The more the individual is concerned about his health, the more he is likely to use health fitness products, read health magazines and show more interest in health information (Meng et al., 2019). Health consciousness, according to Yadav and Pathak (2016), is the degree to which an individual's continuous behaviors are inclined toward their health. Chen and Lin (2018) further added that the consumers' product choice decision depends on their personal interest towards health consciousness. Consumers who are concerned with their health have a more positive attitude toward buying things related to their health. The consumers' attitude and purchase decisions are mainly influenced by their health concerns. Health Consciousness is explained as the readiness of individuals to take steps in order to improve their health (Kaynak and Ekşi, 2014). Authors further introduced this concept as a lifestyle that is "wellness oriented". They considered this concept as a psychological perspective that influences the behavioral patterns to better understand the individuals' actions toward health concerns (Kaynak and Ekşi, 2014). These studies investigate that health consciousness is an important attribute that affects the way a person perceives health information which

formulates the behavioral intention and action. The authors explained the extent health consciousness measures the health orientation that leads to a process of health information. However, health consciousness is not an actual behavior, instead it is psychological trait (Hsu, Chang and Lin, 2016). Hence, this study aims to determine how health consciousness affects the individuals' intention to use a fitness product. The problem discussed in this research is to find the association between the variables named; health belief, health consciousness, gamification and intention to use the product as these variables are still not been studied yet. The goal of this research is to find out the impact of gamification on the relationship between users' health beliefs, health consciousness and intention to use fitness products.

1. LITERATURE ANALYSIS

1.1. The theoretical aspects of health consciousness

Health consciousness is an especially significant psychographic variable creating crowd division relating to medical problems or more worried about health consciousness on the grounds that past investigations have enlightened on key point that health awareness depicts an assortment of health mentalities and practices (Gould, 1988; Furnham and Forey, 1994; Jayanti and Burns, 1998; Iversen and Kraft, 2006; Michaelidou and Hassan, 2008). It is additionally accepted that an individual's degree of health consciousness is firmly identified with how they look for and reacts to health data (Kaskutas and Greenfield, 1997; Iversen and Kraft, 2006; Shim, Kelly and Hornik, 2006; Basu and Dutta, 2008). Thus, noticing individuals' health consciousness is significant in planning health intercessions or planning health contraptions and dividing objective publics since it decides their reactions to health data and directions of health data. In particular, Forthofer and Bryant (2000) clarified the why factor by creating a clear distinction between health conscious and non-health conscious people in various ways. In the first place, and most generally, various ways to deal with bunches with various degrees of health awareness are achievable, which thus builds the adequacy of health intercession. Second, as per Forthofer and Bryant (2000), people with high health consciousness are viewed as "targets of most prominent opportunity" (p. 37) on the grounds that they are bound to be prepared to embrace health related exercises. By focusing on health-conscious people, health intercessions have a superior opportunity to accomplish helpful results (Forthofer and Bryant, 2000). Lastly, health-conscious individuals' viewpoints or behaviours may spread to those who are less likely to modify their beliefs or behaviors (Forthofer and Bryant, 2000).

This review proposes the thought of "health consciousness" makes the interest of the crowd to utilize the health related application or to include in health related exercises. In such manner, Slater and Flora (1991) distinguishes the health conscious and non-health focused crowds which firmly identified with the idea of health consciousness, and the healthy way of life investigation addresses an early endeavor to gauge one's degree of health awareness.

1.1.1 Dimensions of health consciousness

This part will examine five significant aspects zeroing in on health consciousness. Various ways to deal with the idea of health consciousness have produced various meanings

of the idea. Be that as it may, five parts have reliably showed up in investigations over the past twenty years, which are (1) integrating health behavior of individuals, (2) consideration individual's health, (3) health data collection and utilization, (4) individual's health obligation, and (5) Motivation towards health.

1.1.1.1 Dimension 1: Integrating health-behavior of individual

Similar to Slater and Flora (1991), Kraft and Goodell (1993) associated a person's health consciousness with an inclination toward a happy lifestyle. For Kraft and Goodell (1993), wellness is "a series of personal activities, interests and opinions related to health" (p.18). According to Kraft and Goodell (1993), there are four main sub-dimensions of health behavior: (1) Considering the Alarming Environment, (2) Individual Physical Fitness, (3) personal interest and obligations, (4) nutrition as well as stress management about health. In addition to the four items that measure responsibility for an individual's health, these items were dedicated by Kraft and Goodells (1993) to measure an individual's actual behavior. For example, "Exercise 30 minutes a day, 3 days a week or more", "Avoid foods containing nitrites and preservatives", "Daily diet is nutritionally balanced". Similarly, many consumer marketing studies address individual health behaviors and attitudes from a "healthy lifestyle (wellness)" perspective. Bloch (1984) explained healthy lifestyle as avoiding health problems and improving individual’s well-being. In most studies, individual behaviors, such as food consumption and physical activity, are frequently used to understand and quantify the degree of health consciousness (Divine and Lepisto, 2005). The definition of health consciousness in Jayanti and Burns (1998) - "The extent to which health problems are integrated into a person's daily activities" (p.10). For example, people who lead healthy lifestyles, according to Divine and Divine and Lepisto (2005), tend to exercise more frequently, consume white meat, fruits, and vegetables, and stay away from fried foods, soft drinks, and lean meats. Similar to this, Dutta-Bergman (2004a), who refers health consciousness as a health activity, employs four health-related behaviors—healthy eating, exercise, and alcohol intake (negative correlation)—to boost a person's level of health consciousness. Based on a national survey, four groups are introduced by Tabacchi (1987) named; traditional, weight conscious, health conscious, and uncompromising. These groups are based solely on attitudes and behaviors from the perspective of food consumption. According to the Tabacchi (1987) classification, health-conscious consumers differ from weight-conscious consumers who are primarily concerned with caloric intake. Characteristics of health-conscious groups include regular

exercise, small families, and college education. In particular, health-conscious individuals avoid butter/margarine, chemical additives (such as sugar), soft drinks, and fried foods, while preferring vegetables and fruits, whole grains, roasted or fried seafood, and skim milk (Tabacchi, 1987). According to another survey conducted among women participants, Tai and Tam (1997) found that "weight awareness," "health awareness," and "environmental awareness" had a significant impact on respondents' daily lives. Detailed survey items include health behaviors such as grocery shopping / consumption and exercise habits as measurement items for weight consciousness and environmental consciousness. According to other studies, health consciousness was measured.

1.1.1.2 Dimension 2: Psychological/Inner state

However, the view of Gould (1988) is slightly different from the view presented in the previous study. According to Gould (1988), health consciousness is person's psychological or internal state. It includes health alerts, health self-awareness, health effects, and health self-management. Furthermore, according to Gould (1988), health consciousness is a psychographic trait that is not connected with external behavior. Thus, health consciousness as an independent variable predicts health care and prevention behavioral and attitude measurements (Gould, 1988). For example, it was found by Gould (1990) that physical activity and health consciousness are not interrelated. Instead, health consciousness is positively associated with dietary lifestyles such as vitamin intake and calorie reduction. Additionally, those who are concerned about their health are more likely to read and discuss health issues (Gould, 1990), rather than being skeptical about health care institutions and more towards unorthodox medical options. It is known to be open (Gould, 1988). Iversen and Kraft (2006) focused on psychological or internal conditions, following the discussion of Goulds (1988; 1990) about health consciousness.

Further, an individual having a clear focus on his or her health is considered as in state of health consciousness (Iversen and Kraft, 2006). Additionally, Iversen and Kraft (2006) elaborated this point that that health consciousness and health anxiety or fear of illness are not same concepts. Following the guidelines of Gould (1980; 1990) about health awareness, a positive association between health consciousness and preventative health behaviors (such as fruit and vegetable consumption and exercise) is found by Iversen and Kraft (2006). Dutta-Bergman (2004a) also emphasized the psychological characteristics of health consciousness, including (a) health information orientation, (b) health beliefs, and (c) health activity health orientation. In this respect, the conceptualization of health consciousness by

Dutta-Bergmans (Dutta-Bergman, 2004b; 2006) and Dutta (2007) is similar to the conceptualization of Gould (1988; 1990) and Iversen and Kraft (2006), but of "health-oriented".

1.1.1.3 Dimension 3: Health information seeking and usage

The definition of health awareness was ambiguous regarding whether actions related to health information were considered as health consciousness or indicators that an individual reflect in state of health consciousness. Another important element of health consciousness is the social media usage and other available resources to get the health information. For example, a key element of health segmentation is proposed by Rodgers et al. (2007); the use of individual media. Rodgers et al. (2017) argued that combining the traditional auditory segmentation criteria i.e. population statistics and health assessments and variables related to media usage can enhances the predictability of individual health behaviors as the basis for effective auditory segmentation. The combination of conventional and media usage variables creates four groups of audiences named; uninformed health, autonomous health, health consciousness, and endangered health (Rogers et al., 2007). Health-conscious group is explained as those who are aware of health information and its sources but who may not be well-versed in it or independent in their information-seeking. Thus, individuals who fall under category of health-conscious group search health information through known channels while others who fall under autonomous health group just take the information from different type of channels i.e. different media channels. A number of scholars found that health consciousness and participation in health messages are closely related to each other (Aldoory, 2001; Iversen and Kraft, 2006). Here, Iversen and Kraft (2006) believe that individuals who are completely involved in discussing and processing the recommendations of health messages feels more connection with health messages. As per Furnham and Forey (1994), health information searching and actual food consumption are major factors of health consciousness. According to Furnham and Forey (1994), health consciousness is a life style having self- and ecological consciousness, including health information, seeking food consumption, concerns about the natural environment, and awareness of medication prescriptions. Similarly, Kaskutas and Greenfield (1997) considered health consciousness to consist of nutritional issues and a search for information related to health matters. Additionally, a series of research by Dutta found that health consciousness is a significant predictor of personal health information seeking (Dutta-Bergman, 2004b; 2006; Dutta, 2007).

Therefore, Dutta-Bergman (2004b; 2006) and Dutta (2007) found that these behavior are consequences of being influenced by health consciousness, not by health consciousness itself. Specifically, Dutta-Bergman (2005) shows that in addition to the information provided by physicians, health awareness is the key element which pushes an individual to search for information related to their health.it is also found that people who are more concerned about health i.e. health conscious people, are more inclined toward health information seeking through media (Dutta, 2007). Secondly these people use different primary sources for health information search such as newspapers, magazines, the Internet, and interpersonal networks (family, friends, etc.). While on the other hand, people who are less concerned about health prefers television and radio for health information search (Dutta-Bergman, 2004b).). Lastly, health conscious people do not forget health related content and follow health-related suggestions in daily-life (Dutta-Bergman, 2006).

1.1.1.4 Dimension 4: Personal responsibility

In earlier studies, it is found that individuals with high consciousness about their health are more active and responsible in managing their health related activities. It is suggested by Kraft and Goodell (1993) that health responsibility is an important factor among four main elements of health consciousness. After a careful comparison of health conscious and health responsible people, the same idea is presented by Dutta-Bergman that individuals who are health conscious are more responsible for their health (Dutta-Bergman, 2004a). Furthermore, health conscious people are more actively engaged with online and offline health communities are implement health maintenance recommendations in their daily life (Basu and Dutta, 2008).

1.1.1.5 Dimension 5: Health motivation

Moorman and Matulich (1993), who defines health motives as "intentional awakening to participate in preventive health behaviors," states that health motives are those factors which push an individual to adopt or avoid certain behaviors such as health information retrieval and health maintenance. As per suggestion of Jayanti and Burns (1998), we can consider health motivation as stable psychological trait of individuals. It is found by Dutta Bergman that the main factor of health consciousness in people is health motivation which is reflected through their behavior and activities i.e. health conscious people value their health more as compared to others (Dutta-Bergman, 2004a). The same idea is explained by Dutta as "Living in the best possible health is very important to me" (Dutta, 2007; Dutta-Bergman, 2004b; 2006). Another definition for health consciousness is also presented by

Dutta-Bergman (2004a); "an indicator of consumers' essential motivation to stay healthy" and "a reflection of their responsibility for health" (pg. 398). However, the concept of health consciousness presented by Dutta is very different from Jayanti and Burns (1998). According to them health consciousness and health motivation are not related to each other. It is found by Jayanti and Burns (1998) that "motivation for health refers to the internal characteristics of a person, and health consciousness refers to the external characteristics of how human health is cared for" (pg.10). Additionally, as per findings of Jayanti and Burns (1998) "health consciousness includes the value of health in preventive medical behavior." (NS. 8). Thus, Jayanti and Burns (1998) found a new way to measure the health value. In order to measure health value, they ask how much a certain action related to health was worth in terms of its advantages (for example, avoiding stress, staying healthy longer, looking younger). In short, health consciousness is conceptualized in different manners by a number of scholars and none of the concepts were same. The five main facets of health consciousness are revealed by this literature review: (1) participation in health behavior, (2) psychological care for one's health, (3) retrieval of health information and Use, (4) personal responsibility, (5) motivation for health. Therefore, health-conscious people are generally responsible for their health by actively incorporating healthy behavior into their daily lives, i.e. by paying continuous attention to their health and using different resources to get health information. It is characterized by having and motivation to stay. However, Hong (2009) re-conceptualized the health consciousness and presented a brief dimensions. The same dimensions are used in current study. The re-conceptualized dimensions for health consciousness are self-health awareness, personal responsibility, and health motivation.

1.2. The theoretical aspects of Health Belief

Jones, Smith and Llewellyn (2014) notices and puts stock in wellbeing convictions, which make up health, what makes it sound, what makes it wiped out, and how they conquer it. Characterized what can help. Components incorporate, for instance, nourishment, weight control, dosing, or work out (Pereira et al., 2014).

Johnsona et al. (2016) further researched her convictions in wellbeing in her review by leading a meta-investigation. Her discoveries clarified that game creation is firmly connected with a confidence in wellbeing. The creator characterizes confidence in wellbeing as an individual's mental conduct towards impression of wellbeing, and his discoveries additionally shape the faith in wellbeing into four useful ideas: saw weakness individual to

ailment. Weakness, noticed urns-urns rope portrayed aliment and individual saw interest in expectation for sickness. We consider conduct as an advantageous social upgrade signal that sets off solid conduct (Johnsona et al., 2016). Green and Murphy (2014) have characterized our faith in health as a person who sees himself as sound and characterizes the boundaries for estimating his well-being in this specific situation. Thorne (1993) sees health mindfulness as an individual-explicit thought acquired by society and containing clinical information. Thorne (1993) further added that all social orders foster a bunch of convictions, strategies, and jobs that are predictable with their way of life, further characterizing their insights, decisions, and convictions about wellbeing and sickness (Thorne, 1993). Along these lines, this review intends to recognize the effect of wellbeing convictions on the aim to utilize wellness items.

1.2.1. Network Interventions and Health Belief

Research over many years has shown that an individual's health related behavior can be changed through behavioral interventions. However, the most important role of behavioral intervention is that they must reach to those individuals who need it most. It is well documented that social institutions play a key role in healthy behavior adoption. It is suggested by social psychological studies that in contrast to personality, attitudes, and other elements at the individual level, the social environment can be altered or designed to have a substantial impact on behavior (Sherif and Hovland, 1961; Latané and Darley, 1970). Other authors have found that when individuals have enough social support and constructive network interventions, they are more inclined to behavioral change. While on the other hand, the same individuals may show resistant to behavioral change due to lack of significant behavior support (Berkman et al., 2003). Therefore, we need to understand the importance of social media interventions role for behavioral changes. Thus, in order to increase individuals' participation in health related activities, social media interventions are also widely implement by internal health programs (Valente, 2012). Social media is used as a major channel for behavior change such as social support, social sharing and social impact processes i.e. verbal persuasion and modeling. Network intervention not only helps to adopt behavioral change, it also helps to maintain these changes as usually network members are related to each other. The association between network members has a lot of benefits for those individuals who are suffering from serious health conditions. For example, people with serious health matters can get social, emotional and financial support from other network members. Hence, the process of providing support, care, and behavioral change for secondary prevention may benefit by

involving and taking into account these network members. However, it is not necessary that all network interventions have such connection, some network interventions are self-centered and only provide support for individuals. There also other type of networks named sociometry interventions, in which individuals within a group are connected to each other i.e. schools and classrooms (Cappella et al., 2013). Sociometric network analysis often focuses on network structure, while personal network analysis tends to focus on network function. On the basis of network structure, sociometric network interventions frequently identify key participants in training, such as those with the highest number of links or those that can affect them. For example, the structure of friendships in schools and classrooms can be schematized as a social measurement network that maps friendships between students in the form of lines. One way to promote behavioral change through sociometry networks is to use a community opinion leader (CPOL) (Cappella et al., 2013). Community opinion leaders are mostly influential people who are identified by social networks and trained to bring the change. In this approach, for each member of the network as well as the member who had the highest score during training, network attributes like centrality is derived. Another way to identify opinion leaders is nominations and ethnographic observations. Additionally, there are some factors that must be considered form network interventions such as network stability and structure, frequency of interaction, and opinion leader reliability on a particular topic. The efficiency of CPOL can also be affected by structural aspects of social networks, such as density (refers to the proportion of users in a network divided by the total number of connections that can exist).

1.2.2. Social Support and health belief

In the areas of brain science and psychological wellness, social help has been viewed as one of the significant social effects on wellbeing related practices. Informal organizations can be conceptualized as a particular wellspring of social help. The trading of social help is the fundamental reason for the turn of events and support of social connections. Social help is by and large known to help wellbeing, yet mediations to work on friendly help and advance wellbeing results don't generally have a steady beneficial outcome on wellbeing results. The characteristics of social connections that can be illustrated by informal organization examination assist with giving a more unpretentious investigation of social help and assist with clarifying apparently disconnected discoveries. There was agreement in the writing on five significant kinds of social help: enthusiastic, monetary, or material, enlightening, instrumental, and socialization (Thoits, 2011). Enthusiastic help conceptualized as having a

place, confidence, or worth is underlined in the writing. Organizations can be conceptualized as substantial and elusive sources and backing techniques. For the people who are avoided with regard to a general public where assets are restricted at the singular level, individuals from the encouraging group of people are significant assets for essential assets like food and lodging, and data on where to get those assets. Enthusiastic help frequently essentially affects burdensome manifestations, however in low-pay networks, material help might be more firmly connected with mental prosperity than passionate help (Berkman et al., 2003). Social help likewise remembers enlightening help for correspondence for medical problems like apparent dangers and the board help, and demonstrating of how to adequately address medical problems. The help given by network individuals isn't constantly custom-made to your necessities. Offering help can likewise have unseen side-effects. Instrumental help can lessen people's self-adequacy. Backing can likewise be viewed as unreasonable interest, irregularity, equivocalness, and obligation. Assistance with canning leads to a view of responsibility and disdain and can keep individuals from tolerating the help given and the potential wellbeing impacts it has (Miyamoto and Sono, 2012). The requirement for help, like consideration, can likewise struggle with family and sexual orientation jobs, and negative help and clashes have been viewed as reliably connected with adverse results. From the investigation of informal communities, it is feasible to decide if individuals who offer material and passionate help are the reason for struggle just as the degree of collaboration between the individuals from the organization. The very individuals from the organization that offer material help and are causing struggle can simultaneously forestall and help specific wellbeing results. The casual consideration writing has explored the qualities of organization connections that can hinder and advance the arrangement of social help. A remarkable variable is correspondence (Thoits, 2011). Notwithstanding, numerous social help mediations do exclude systems to advance correspondence. Rather, they center just around offering help to people distinguished in a specific ailment. Backing can prompt expanded clash and relationship stress when beneficiaries and promoters attempt to control a similar wellbeing conduct. While saw social help is significant for some wellbeing practices, it can likewise be more significant for other wellbeing related practices like consistency with prescriptions. The mediation can change the apparent help without changing the apparent help, or it can change the apparent help without changing the apparent help. Moreover, helpless restricting help might further develop prosperity, yet may not help social changes (Rogers et al., 2014). When planning network intercessions that attention on keeping up with and working on friendly help, it is important to decide (1) the overall significance of saw and

upheld support, and solid and feeble ties. (2) Guarantee that the help given doesn't think twice about viability, independence and control. (3) Give a method of common advantage. (4) Foster help methodologies that don't cause relational clashes or other accidental unfriendly impacts.

1.2.3. Behavioral change mechanism by intervening networks

Social media interventions can employ a number of techniques to promote behavioral change. Network members can motivate each other for participation in health related activities by rewarding them. However, not in every case, rewards are fruitful, in some cases, members may punish those individuals who are not willing to participate. According to social cognitive theory, members of the network can model behavior, which can lead to improved self-efficacy and response effectiveness. As per results of observational studies, social norms are deeply rooted in social networks and hence exerts influence on individuals' behavior related to academic and health activities (Frank et al., 2008). Some authors suggested that social norms can be promoted through development of social media interventions (Latkin et al., 2009). Additionally, social norms can also influenced by network members' behavior either it is participating (descriptive norms) or approving behavior (preventive norms). Talking and modeling health behaviors can influence the behavior by making the social norms involved and supporting these behaviors more prominent, appearing more general and online accepted. Fellow educators who talk to friends about the use of exercise applications not only disrupt social norms and make the subject socially acceptable, but the use of mobile applications improves people's awareness, health and physical condition. You can raise awareness that it will help you. Maintain. The social identity of a group may be formed through certain behaviors of a network. Thus, in order to maintain its identity, it is necessary for group to main its behavior. These certain health behaviors of groups helps members to define the certain circumstances. Members of the network, for example, may comment that eating specific foods is unhealthy if the same conduct has not previously been assessed from a health viewpoint.

1.2.4. Role of Communication skills:

One of the principal ways to deal with working with conduct change inside web-based media is for individuals from the organization to talk and empower explicit wellbeing practices. Relational abilities preparing is needed to begin and keep up with discussions about solid conduct. Likewise, individuals about relational abilities to verbally compensate others associated with conduct, model sound conduct, and examine wellbeing conduct in a way that

doesn't inspire responses or challenge self-viability. You additionally need to prepare. Telling organization's individuals that smoking is terrible for your wellbeing may not be the best methodology for individual instructors to begin a discussion (Rogers et al., 2014). Such an articulation can be viewed as basic and doesn't prompt further discussion about smoking. One of the motivations behind such discussions is to reinforce accepted practices. Conversations about the need to decrease children's openness to roundabout smoking might increase current standards for children's prosperity. The adequacy of correspondence in changing wellbeing conduct is portion related (Bem, 1967). Basically saying that a conduct is unfortunate may not expand discussions regarding that conduct. Wellbeing correspondence materials are essential, yet additionally intriguing enough to be a subject for future discussions and tattle. Empowering others to stop smoking might be less hesitant to impart abilities that speakers find for their work or feature issues they experience than lecturing the shades of malice of smoking (Miyamoto and Sono, 2012).

1.2.5. Social Influence vs Differential Affiliation

Individuals who use social media to promote healthy behavior, sometimes overestimate its impacts, which is not a good sign for promotion of healthy behaviors. There is strong theoretical and empirical support for the social impact of behavioral change, but with inverse causal relationships, that is, with individuals who have similar traits of interaction, such as liking and maintaining relationships with each other. There is also strong evidence of different relationships.

There was a lot of discussion about whether the habits or activities of a network members were similar due to social influences or affiliation differences. It was also discussed that possibility of similar habits may occurs due to both above mentioned factors (Shalizi and Thomas, 2011). However, studies of observational studies of affiliations that differ from social impact need not be a comprehensive guide to social networking interventions in which the findings attempt to deliberately change behavior through the process of social impact. It is reasonable to believe individuals having addiction of alcohol must be addicted to other harmful heavy drinks (Mundt, Mercken and Zakletskaia, 2012). However, other current or previous heavy drinkers can also affect other drinking patterns.

1.2.6. Role of mobile technology in promoting health by building social networks

Organization intercessions were frequently done in little gatherings, yet web-based media was effectively utilized by online self-improvement gatherings to advance smoking discontinuance and other wellbeing practices (Cobb, Graham and Abrams, 2010). One of the

elements of online gatherings is that they are effectively available to many individuals. For scientists, online gatherings effectively give information that can be utilized to examine how organization constructions and job capacities work with combination inside an internet based local area and backing social change. Electronic correspondence goes about as a criticism way for reinforcing standards, demonstrating conduct, offering social help and pieces of information for conduct change, and addressing impediments to conduct change. Notwithstanding, abuse of online media has been viewed as related with social seclusion and reduced mental prosperity (Shalizi and Thomas, 2011). Likewise with eye to eye social collaborations, adjust the explicitness of help and the instrument of social contact with the conduct of the subject. When considering and utilizing web-based media, it is useful to recognize major and cozy connections from frail ones. Online encouraging groups of people regularly comprise of the last option and might be comparative as far as wellbeing, however such organizations might have high turnover rates. These organizations can give empathic agreement, approval, and good examples, yet are more averse to offer instrumental social help (Latkin et al., 2009).

1.3. The theoretical aspect of gamification as moderator

Johnsona et al. (2016) characterized gamification as embroiling game plans mechanics into a non-gaming setting that are additionally utilized in organizations to advance the item. Gamification is intended to (gamification as consolidating specific game elements in an intuitive framework as opposed to giving full-fledged games as a finished result. It coordinates those highlights in an intelligent framework that plans to cultivate inspiration just as connect with end-clients by utilizing game components or mechanics. Gamification has shown up as the most recent pattern in the business climate and is appreciated by instructors, professionals, and scholastics having a place with various fields, in spite of the fact that it has broad roots before (Pereira et al., 2014). Despite the fact that gamification isn't the most recent pattern ordinarily, its fundamental idea has been talked about by implication in different examinations previously, like point's cards, instructive designs, rewards participations, most noticeably academic levels, degrees and grades, and work environment usefulness (Kim et al., 2018). Here, the primary concern to talk about is the contrast among games and gamification. Avedon and Smith (1979) thought that games are intentional exercises limited by rules yet further require struggle between equivalent gatherings and an inconsistent final product. Crawford (2003) expects games to be portrayals of some the truth, be predicated on the collaboration between the framework and the client, and give struggle

yet in addition to wellbeing through reenactment. In their compelling work, game creators Tekinbaş and Zimmerman (2003) characterize a game as a framework where players take part in a fake clash, characterized by deciding that outcome in a quantifiable result. Juul (2003) further added through his examination the essential elements of quantifiable results; player exertion, esteem loaded results, rules, variable, player speculation, and debatable outcomes, as per genuine impacts. When contrasted with games, it is very simple to characterize the idea of gamification rather than its materialness. While no specific models have been set to characterize gamification suitably, yet the majority of the researchers commonly settle on characterizing it as the utilization of game mechanics just as components in non-game settings. Nonetheless, a more profound perspective on gamification, including hypothetical establishments, all-encompassing purposes, and norms for training, requires further turn of events. Deterding et al. (2011) further researched that gamification includes applying such components of gamefulness, gameful plan just as gameful connection in view of a specific goal. Here, the gamefulness is alluded to as lived insight, and gameful collaboration is alluded to as items, apparatuses and settings that give the experience of gamefulness, and gameful plan are alluded to as the act of drafting gameful experience. While gamification can likewise be taken into genuine setting, however it necessitates that the end framework is certainly not a completely fledged game. Writers portray the consideration of the peruser on a significant point that gamification is less clear as is it seen, given the subjectivity that associated with recognizing the full game from the framework which scarcely utilizes at least one than one game component, (for example, assessing the quantity of components that are required till the gamified framework is changed over into the game), the different definitions for "game", and job of a member in assessing the framework as being gameful, game, or in any case. Additionally, gamification is the bundle of amusement games that are intended to draw in or inspire clients for explicit assignments (Deterding et al., 2011). Organizations are possibly utilizing it to construct profound associations with their client by controlling their conduct, expanding steadfastness and commitment (Zichermann and Cunningham, 2011). This gamified framework principally has highlights for objective setting, achievement input, and persistent advancement through different components, for example, identifications, challenges, rivalries, point scores, social criticism, relatedness support, client decision in planning and taking part in objectives and exercises, or offering some benefit based or passionate reasonings through stories for movement (Rigby and Ryan, 2011; Seaborn and Fels, 2015).

Besides, Cotton and Patel (2019) characterized gamification with regards to wellbeing and wellness as planning the game components, for example, identification, level or focuses, so that can assist with encouraging an individual's wellbeing and wellness. The creator further added that gamification had been utilized to change individuals' conduct towards wellbeing and wellness application. In his review, he plainly examined that gamification was all the more regularly utilized in actual work and weight reduction. What's more, it is additionally seen while concentrating on those conduct financial matters regarding gamification impacts the decision making of people in molding their conduct. Thus, here is a chance to test that whether wellbeing and wellness applications can utilize social financial aspects to advance solid conduct in shoppers. For example, focuses have been given to a player if there should be an occurrence of accomplishing the designated conduct and removed if unfit to meet the destinations. This idea basically depends on support hypothesis to keep up with the commitment level and furthermore decreases persuasive weariness by use of this steady support component. Cotton and Patel (2019) examination drives the premise to concentrate on the further ideas of how gamification can cultivate the individuals' conduct towards the goal to utilize wellbeing and wellness applications. It has been reviewed that Consumers' conduct towards reception of wellbeing and wellness applications has been expanding from earlier years, and through their outcomes, they observed that this number had stumbled starting around 2014 (Accenture, 2018). The idea of gamification was additionally researched by Krebs and Duncan (2015), in which their outcomes tracked down that after the underlying reception of applications, numerous customers got exhausted, and close to half of the buyers lost their advantage and quit utilizing these applications inside a half year after the establishment. Firms' as a rule think that it is trying to offer types of assistance utilizing wellness applications and urge clients to utilize these applications.

1.4. Intention to use health fitness application

An application is a software application that can be designed to run Android phones in order to provide the user with some convenient ways to perform specific tasks. It is investigated by Blair, a research company, that trade of apps usually generates the revenue of 189 billion dollars per year that is used 11 times at least by 49% users and 21% by millennials who use the app 50 times at least in a single day. It is further investigated that health and fitness apps represent the portion of 5.18% of the total market that is being used by 35% per day and 40% people in a week (Statista, 2022). McKay et al. (2019) further reported the proliferation of applications in order to improve health; these applications include the

steps being followed in the fitness centre in order to promote physical activity, diet control schedules, chloric intakes and reducing the poor habits, for instance, cigarette, alcohol and to improve mental health. This increase in usage and number of applications related to physical fitness has benefited society in various ways. Therefore, the current pandemic situation worldwide caused by Covid-19 has confined the individuals' at home and reduced the overall physical activity; here in this situation, different organizations, along with the World Health Organization, have encouraged to promote physical activities at home (WHO, 2022). Banskota, Healy and Goldberg (2020) has proposed different applications and tools related to physical activities in order to maintain mental and physical health during pandemics. The author further added these apps have set new trends that belong to different fitness sectors, revolutionized the ways of providing fitness services and built a relationship between the fitness provider as well as the consumer. These latest communication ways and tools have a great impact on the way organizations interact with the consumers, with the support of the latest researches, which evaluates the consumers' interest and motivation towards adopting these devices, their perception towards benefits of app usage, and their intention to adopt this latest trend in different areas (Stocchi, Michaelidou and Micevski, 2019; McLean et al., 2020). So, researchers started to put their efforts into figuring out the factors that impact the intention to use the latest technologies, such as fitness applications in different areas (Gao et al., 2012; Maghnati and Ling, 2013). Among all the theories that are associated with the intention to use the technologies in the marketing context, we found the "Theory acceptance model" or TAM, the most relatable one which has been proposed by Davis. This model is widely used to evaluate audience intention to use the latest technologies (Davis, 1989). TAM theory has further been supported by one of the major psychological theories, "Theory of Reasoned Action" or TRA, according to which persons' real behavior can be evaluated on the basis of their intention to perform that specific behavior (Fishbein and Ajzen, 1975). Such as TAM theory paid more attention to the perception behind using or accepting the latest technology based on two basic believes, how much beneficial the app is and how convenient it to use the app; these two believes laid the foundation of consumers' attitude towards intention to use the app in future for a longer run (Davis, 1989). This research is widely spread in professional settings as its main focus is the utilitarian perspective of technology (Ha, Kang and Ha, 2015) in accordance with understanding the intention of consumers' intention to use the application (Gao et al., 2012). The theory of acceptance model has been previously used in various studies, for instance, healthcare, finance, gaming, tourism and instant messaging. The author further added that this model has great adaptability and

applicability in studying consumer attitudes, intention to use and perceived utility (Rivera, Gregory and Cobos, 2015). Different authors have presented different theories in accordance with the Theory of Acceptance model, for instance, IDT or Innovation & Diffusion theory presented by Lee et al. (2005), in which the author presented the idea that users' belief about the innovation actually decides the user's behavioral act and potential. Later on, Venkatesh et al. (2003) presented another theory whose roots are attached with previous theory, "Unified Theory of Acceptance & Use of Technology Model or (UTAUT)", which defines for basic constitutes that make the applicability of TAM theory viable are: effort expectation, performance expectation, facilitation conditions and social influence. The second version of the UTAUT model further added some more influential constitutes such as hedonic motivation (how much individual's pain & pleasure receptors influence on willingness to achieve the goal or to go away from threat), habit, price or health belief that is being used to measure intention to use the health and fitness application (Yuan et al., 2015). In addition to, in health and fitness, Ahadzadeh et al. (2015) further investigated in their research who subjectively figure out her health as vulnerable to disease would be more concerned about her health, as well as cognitive beliefs, and positive affective feeling about involvement in digital health-related activities. Moreover, the author continues his study with the support of his findings that involvement in such digital activities is proactive behavior instead of reactive behavior, where the Theory of acceptance model acts as a mediating role. Based on these model theories, now latest technologies have studied another component that persuade and construct the individuals' behavior towards intention to use fitness application is gamification, which would act as a mediator in our study to find out its impact on intention to use the application because it is considered as a powerful strategy in order to improve human performance as well as increasing motivation level (Pereira et al., 2014). Moreover, it played a vital role in the health and fitness industry in relation to constructing health behavior to foster intrinsic motivation as well as hedonic motivation for the intention to use fitness applications. It is an informal process in which gaming factors are used in a non-gaming context to increase consumer engagement and consumer revel. Furthermore, Jones, Smith and Llewellyn (2014) defined health belief as what elements people perceive and believe constitutes their health and what element makes them healthy and what causes them ill, and in what ways they perceive can help them out to overcome their illness. For instance, elements can be nutrition, weight manipulation, medication or exercise (Pereira et al., 2014). It is noticed that current research does not give clear outcomes on what are the major factors that drive the intention of an individual to use fitness Apps & to get benefit from the latest

technology in the fitness industry (Ha, Kang and Kim, 2017). However, factors that affect the intention to use Smart fitness applications majorly depend on the type of product that is consumed and the marketing implications (Ha, Kang and Kim, 2017). Accordingly, while studies have been directed on the aims of utilization of innovation, Cell phones and wellness Applications, there isn't an audit that catches the primary discoveries of these examinations. Consequently, the point of this review is to lead an efficient audit of the writing on consumers' goal to utilize Applications identified with wellness and active work by customers.

2. METHODOLOGY

2.1. Aim, Model and Hypotheses of Research

The aim of this research is to investigate the impact of gamification on the relationship between users' health beliefs, health consciousness and intention to use fitness products.

2.1.1. Theoretical Model

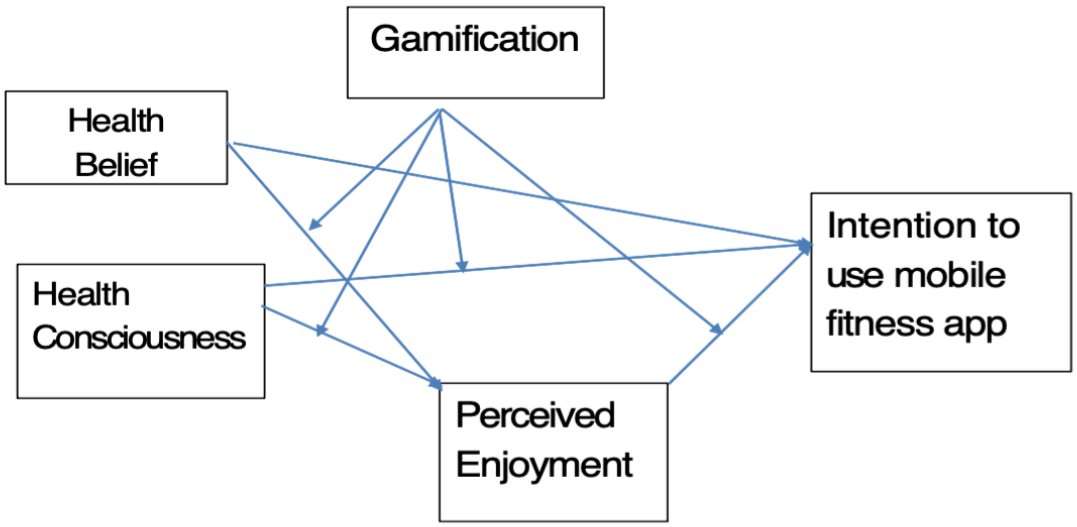

Figure 1: Theoretical Framework of the study Source: self-drawn by author

2.2. Research Hypotheses

All of the variables of current study are linked with respect to the theory of Reasoned Action", Innovation & Diffusion theory and Unified Theory of Acceptance & Use of Technology Model.

Based on our literature, the hypotheses of the study have been presented.

People are becoming aware of their health consciousness and intention to use the fitness applications. A number of research studies undertaken in the past have found that now people use technology more constructively i.e. technology is used as a tool to monitor physical and mental health. It has been found out that people who are health conscious with their calorie

intake, weight gain, exercise schedule and water consumption make rigorous use of the products and rely heavily on them (Jin, Line and Lee, 2017). According to the health belief model, a person's belief in their own risk of illness or injury, together with their trust in the suitability of the advised wellness behavior or activity, will predict the likelihood that they will adopt the certain behavior. Thus, fitness apps are only used by those individuals who are curious about their health.

H1: There is a positive and significant relationship between Health consciousness and intention to use the mobile fitness app.

H2: There is a positive and significant relationship between Health belief and intention to use the mobile fitness app.

Perceived enjoyment has been found to have a relationship with health consciousness and health belief (Taylor and Harper, 2003). People start to enjoy fitness by keeping a track and check and balance which ultimately gives a rise in their perceived enjoyment (Oliver, 1981) hence it is Proposed that perceived enjoyment mediates the relationship between health consciousness and health belief. In the context of this study, perceived enjoyment is defined as a reward derived through the intention to use the product (Lai and Ahmad, 2015).

H3: Perceived enjoyment mediates the relationship between Health Consciousness and Intention to use the mobile fitness app.

H4: Perceived enjoyment mediates the relationship between Health belief and intention to use the mobile fitness app.

Gamification is the utilization of game plan components in non-game settings to impact client behavior. It is a course of moderating a help with health belief and consciousness as gaming encounters to help a client’s generally enjoying high self-esteem (Colwell, Grady and Rhaiti, 1995). Gamification exercises might be intended for the client to rival the earlier self or with peer gatherings. Hence we can easily derive that constructive gamification acts as a moderator (Featherstone, 2018). Wearable gadgets might be ideal devices that assist clients with wellbeing worries to all the more adequately deal with their wellbeing in a paperless configuration on an everyday premise (Windasari and Lin, 2021).

H5: Gamification moderates the relationship between Health-believe and Perceived enjoyment.

H7: Gamification moderates the relationship between Health-consciousness and Intention to use the mobile fitness app.

H8: Gamification moderates the relationship between Perceived Enjoyment and Intention to use the mobile fitness app.

2.3. Data collection and Survey Instruments

Following the quantitative research technique, this research aims to analyze the proposed hypotheses. The target population for current research was universities students of Lithuania. The current research employs convenience-based sampling. Under this technique, the selection of participants was purely based on the researcher's judgment (Dana and Dumez, 2015). Different factors such as easy access, availability, participants' willingness, and geographic proximity (Etikan, 2016) are used for participants' selection. Considering the fact that the target population is infinite in numbers for current research, the Raosoft software is used for sample size calculation. Assuming the 5% margin of error and 95% confidentiality level, the sample size for current research is 377 university students "(http://www.raosoft.com/samplesize.html)".

An online self-administrated questionnaire (Google Forms) was used to collect the research data. The Participants were approached through different social media apps. Participants were requested to show their level of agreement or disagreement to given variable measures' items on a five-point Likert scale, i.e., 1 for *"strongly disagree"* to 5 for *"strongly agree."* The demographic questions included in the questionnaire were about age, gender, and education level.

The survey instruments included in the current study are taken from previous research studies. Previously, researchers recommended different dimensions for health consciousness, i.e. (Walker, Sechrist and Pender, 1987; Gould, 1988; Jayanti and Burns, 1998). The 11 close-ended questions for health consciousness are taken from Hong (2009). In current study, health consciousness is defined as *"as one's orientation toward overall health, rather than toward a specific health issue"* (Hong, 2009). The dependent variable, intention to use in-built mobile fitness apps, is measured as "the extent to which an individual is willing to continue using an app." The questions for the dependent variable are adopted from the research of Esmaeilzadeh (2021). The four questions for perceived enjoyment are taken from Yang et al.'s (2017) study. The questionnaire items for health belief are taken from Hoque et

al. (2018) study. For health consciousness, Gamification is measured as “the extent to which in-built mobile fitness apps used elements of gamification.” The six questions for Gamification are taken from Esmaeilzadeh (2021). The detail of the questionnaire is given in Appendix.

3. RESULTS OF THE RESEARCH

3.1 Descriptive Analysis

SPSS was used for all statistical testing. In this research, we employ path tests of regression and correlation. One dependent variable and one or more independent variables are used in regression analysis, whereby the regression coefficient and regression equation are calculated. The regression coefficient is a number between 0 and 1 that helps maintain a constant relationship between numerical dependent and independent variables. The purpose of the regression equation is to estimate the coefficient of the dependent variable given a set of independent variables (Luna-Reyes et al., 2009). A correlation exists when there is some sort of connection between two variables. Each rise or fall in the independent variable also raises or lowers the dependent variable, and vice versa for a positive association; conversely, a negative association shows that an increase in the dependent variable causes an increase in the independent variable (Luna-Reyes et al., 2009).

The following findings emerge from an examination of the respondent profiles.

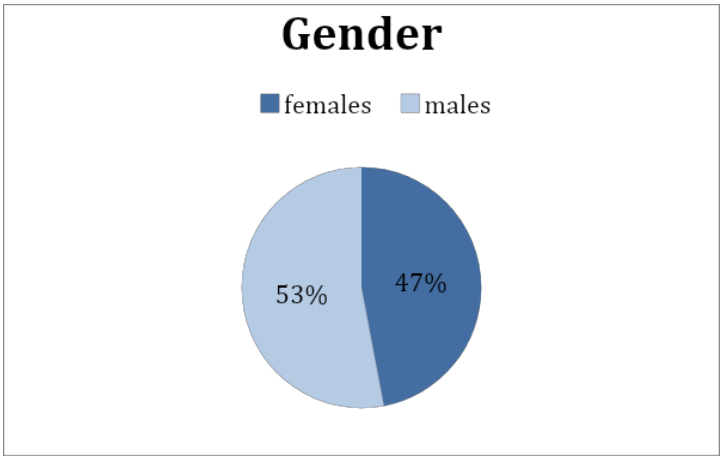

Table 1: Research participants' gender distribution

The respondents are from genders for a better understanding of the impact of proposed variables; out of 377 filled questionnaires, the percentage of individuals from the submitted sample comprised 47 % male and 53% female.

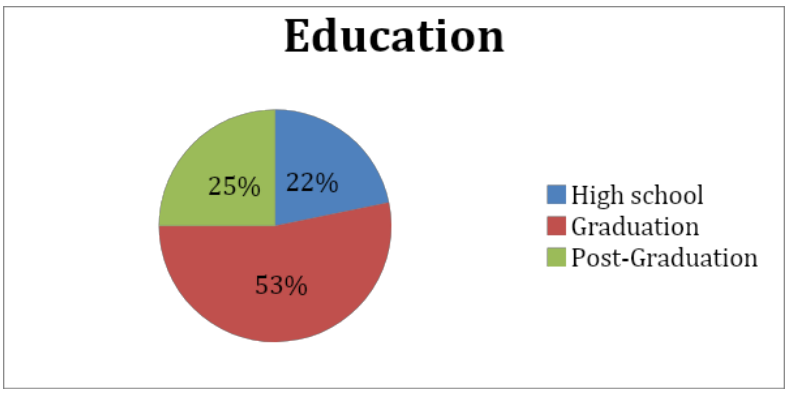

Table 2: Research participants' current education level distribution

Out of 300 respondents, 22% are high school graduates, 53% are graduate students, and 25% are postgraduates.

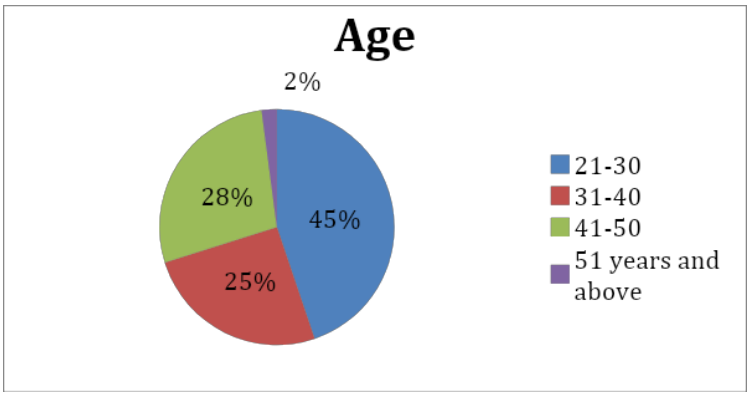

Table 3: Research participants' age distribution

The ages of the proposed sample were distributed in multiple groups. Out of 377, 45% of consumers were aged between 21 years to 30, 25% were in the range of 31 to 40 years, 28% respondents belonged to 41 to 50 years, and only 2% individuals belonged to 41 years and above age.

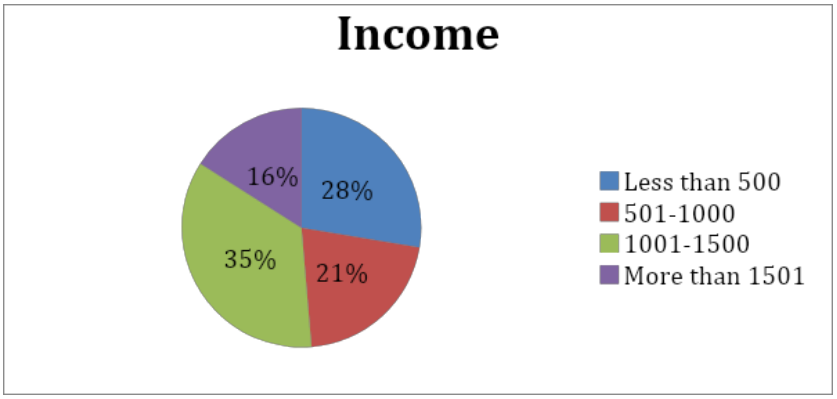

Table 4: Research participants' current income level distribution

Out of the 377 respondents, 28% have income less than 500 euro, 21% of consumers have income between 501 eur-1000 eur, 35% of respondents have income between 1001-1500 eur. Therefore 16% of consumers have a payment of more than 1501 eur.

3.2 Descriptive Analysis of Variables

Variables	Mean	SD
HB	4.26	0.21
HC	3.73	0.56
PE-MED	3.48	0.25
IU-DV	3.71	0.31
GA-MOD	1.48	0.25

Table 5: Descriptive analysis of Variables

Descriptive analysis is used to estimate the mean and standard-deviation of the data collected from 377 respondents. As a mean is the typical value designed by adding all the values of the data whereas, standard deviation explains how much information is extended (Luna-Reyes et al., 2009). The above table shows that the mean value of perceived enjoyment, perceived enjoyment, and intention to use mobile fitness apps is 3.3 to 3.9, which specify that respondents have reacted positively and neutrally. Whereas the responses for the health belief scale moved between agreeing and strongly agreeing, the gamification scale moved between strongly disagreeing and disagreeing. The standard deviation of computed variables is less than 1, which specifies fewer differences in the respondent's replies.

3.3 Data Screening

The purpose of data screening is to find out any outlier or any violation related to the basic assumptions of data before the application of multivariate techniques. The data that was collected was thoroughly examined and analyzed for any missing values fortunately there

were no missing values found in the data. In order to remove outliers Multivariate analysis was conducted by the Mahalanobis analysis on the SPSS which is the technique that is used to eliminate those observations which are the outliers in the data. A multivariate outlier is a combination of unusual scores on at least two variables. It can be calculated by Mahalanobis distance. For the detection of multivariate outliers, Mahalanobis distance critical Chi-Square function be $p<0.001$. Through which 16 outliers were removed.

3.4 Reliability Analysis

The model comprised 27 items as the SPSS reliability test was run and the factor loadings were calculated. The model is fit for analysis, as all the latent variable item constraints are < 0.7 are (Hair et al., 2013).

c-alpha	N of Items
.892	11

Table 6: Reliability Statistics

The eleven items that are used to measure the health-consciousness variables are reliable. As the value of Cronbach's Alpha is 0.892 is more significant than 0.6, which shows the reliability of this variable.

c-alpha	N of Items
.905	2

Table 7: Reliability Statistics

This variable consists of two items, and these items are appropriate and reliable for the measurement of Health-believe because the value of Cronbachs Alpha is 0.905 is more significant than the benchmark.

c-alpha	N of Items
.890	4

Table 8: Reliability Statistics

For the measurement of Perceived enjoyment, four items were used, which are not reliable for this variable. The value of Cronbach's Alpha is 0.890.

c-alpha	N of Items
.894	4

Table 9: Reliability Statistics

Intent to use is measured with the help of four items, and the reliability test indicates these items are reliable for measuring our variable. As Cronbach's Alpha value is 0.894 is more significant than 0.6.

Cronbach's Alpha	N of Items
.894	4

Table 10: Reliability Statistics

Gamification is measured with the help of six items, and the reliability test indicates these items reliable for the measurement of our variable.

As per the prediction of (Anderson & Gerbing, 1988), we used a two-step pattern. Initially, examination of reliability in proposed data by Cronbach's alpha value (Bagozzi et al., 1991) interpreted that Cronbach's alpha value is not less than 0.7. Furthermore, all the items in this study have loadings above 0.7, as shown in the tables.

3.5 Hypothesis Testing

Model	R	R Sq	Adj. R Square	Error
1	.772[a]	.521	.511	.53373

Table 10: Model Summary (health believe)

The value of regression coefficient r = 0.772 suggests a superior level of prediction. This indicates that Perceived Enjoyment can predict intent to use mobile fitness apps up to the level of 72.2%. The Coefficient of determination represents that 52.1% of the variation in a plan to use a mobile app is caused by perceived enjoyment. In this case, the interpretation of adjusted r square is not required because there is only one independent variable.

Model	R	R Sq.	Adj. R Square	Estimate
1	.783	.590	.535	.71397

Table 11: Model Summary (gamification)

The regression coefficient value, i.e., r = 0.738, suggests a superior level of prediction. This indicates that Gamification can predict intent to use up to the level of 73.8%. The Coefficient of determination= R-square= 0.545 represents that 54.5% of the variation in Intent to use is caused by gamification. In this case, the interpretation of adjusted r-square is not required because there is only one independent variable.

3.6 Regression Analysis

Model	**B**	**T**	**P**	**VIF**
(Constant)	-1.103	-4.590	.000	2.994
HB	.591	7.116	.000	1.077
HC	.334	5.844	.000	4.104
PE	.108	1.181	.240	4.341
GA	.182	1.998	.000	2.994
IU	.184	2.001	.000	2.888
Adj. R-Square = 0.787		**Sig** = 0.000	**F- Statistics** = 137.407	

Table 12: Regression analysis

This table shows the Regression analysis of complete variables, including the dependent and independent with Beta value, t-value, p-value VIF Adjusted R-square, and F values. The positive β value indicates a positive relationship between the variables. Thus

heath-consciousness', health beliefs, perceived enjoyment, and gamification have a positive impact on intent to use a mobile fitness app. The β values form this equation of intent to use:
INTENT TO USE = -1.103 + 0.591 + 0.334 + 0.108 + 0.182+0.184

The values of the t-test confirm the importance of each variable in the model. The results of VIF are more minor than 10, representing that no multicollinearity happens between the variables, and any variation in the value of one variable will not disturb the value of another variable.

The analysis of relations between a independent variable and dependent variables:

Correlation analysis studies that show a difference in one variable cause the difference in another variable. The variance of one variable expects to be the source of a similar difference in another variable (Wouters et al., 2013). The results of path analysis in which each part is correlated with the hypothesis. The hypotheses between the underlying variables and dependent variables are evaluated based on significance ($p < 0.05$), sign, and t-value >1.96 (Wixom & Watson, 2001). Higher the constant, the more significant the impact of variables among independent and dependent.

	RELATIONSHIP	Original Sample (B)	T Statistics	P- Value	Supported
H1	HC-IU	0.854	54.824	**0.001**	Yes
H2	HB-IU	1.348	9.647	**0.000**	Yes

P<0.1,* P<0.05

Table 13: Relationship of IV & DV

H1: There is a positively-significant relation in-between Health-consciousness and intention to use a mobile fitness app.

The results supported and interpreted that perceived enjoyment has a significant positive impact on intention to use a mobile fitness app with a coefficient value of 0.854 and P= 0.00, i.e., P<0.05. As the p-value (sig value), i.e., 0.00, is less than 0.05, the null hypothesis is rejected, and the alternate idea is accepted. This means that there is an impact of health-consciousness on the Intent to use.

H2: There is a positively-significant relationship between Health belief and intention to use the mobile fitness app.

The results supported and interpreted that health belief has a significantly positive dependence on intention to use the mobile fitness app with a coefficient value of 1.34 and P= 0.00, i.e., P<0.05.

Mediation Analysis:

The mediation analysis is supposed to be done in the model when the intervening variable is needed to be introduced**.** Mediation analysis determines the in-direct effect of the independent variable on the dependent variable via an bridging variable (Baron & Kenny, 1986). An approach calculates the indirect effect by multiplying two regression coefficients (Sobel, 1982).

	RELATIONSHIP	Original Sample (B)	T-Statics	P- Value	Supported
H3	HC-PE-IU	0.145	2.058	0.013	Yes
H4	HB-PE-IU	0.180	1.755	0.000	Yes

P<0.1,* P<0.05

Table 14: Mediation Model

H3: Perceived enjoyment mediates the relationship between Health consciousness and Intention to use a mobile fitness app.

H4: Perceived enjoyment mediates the relationship between Health belief and intention to use a mobile fitness app.

Hypothesis H3 & H4 are accepted as perceived enjoyment and health belief has a significant positive effect on the intention to use mobile fitness apps (p-value = 0.010, 0.000, i.e., <0.05), so this indicates that perceived enjoyment mediates the effect of independent variables (perceived enjoyment and health belief) on the dependent variable (intention to use a mobile fitness app).

Moderation Testing:

The moderation is imposed in the model when the moderator was introduced**.** Moderation assesses an in-direct effect of the independent variable on the dependent variable via a moderator variable (Baron & Kenny, 1986).

	RELATIONSHIP	Original Sample (B)	T-Statics	P- Value	Supported
H5	HB-GL-PE	0.145	2.058	**0.040**	Yes
H6	HC-GL-PE	0.180	1.755	**0.080**	No
H7	HC-GL-IU	-0.190	2.900	**0.045**	Yes
H8	HB-GL-IU	-0.122	2.500	**0.001**	Yes
H9	PE-GL-IU	-0.211	1.98	**0.002**	Yes

Table 15: Moderation Model

H5: Gamification moderates the relationship between Health belief and perceived enjoyment.

H6: Gamification moderates the relationship between Health consciousness and perceived enjoyment.

H5 and H6 results supported and interpreted that gamification has a positive significant moderating impact on perceived enjoyment regarding health belief & perceived enjoyment with coefficient value 0. 145, 0.180 ; p-value 0.050 & 0.000 respectively.

H7: Gamification moderates the relationship between Health consciousness and Intention to use the mobile fitness app.

H8: Gamification moderates the relationship between Perceived Enjoyment and Intention to use the mobile fitness app.

H7 and H8 indicate that gamification has a negatively-significant moderating impact on intention to use the mobile fitness app in respect of Health consciousness and perceived enjoyment as the p-value is less than 0.05 and beta value interprets the adverse effects of gamification.

	R Square	R Square Adjusted
IU	0.809	0.806

Table 16.

The R^2 measures a construct's percentage discrepancy explicated by the model (Wixom & Watson, 2001); in this model, the value of R^2 shows that perceived enjoyment, health believes, and perceived happiness predicts 80% variance in the dependent variable, i.e., intention to use mobile app.

4. CONCLUSION

4.1 Discussion

This research is being conducted to examine the impact of health belief and health consciousness on intention to use mobile fitness apps with the mediating effect of perceived fun and moderating effects of gamification. The study was conducted online within a population of fitness app users; sample sizes of 377 users were drawn from university students. The results demonstrated that there is the existence of a strong relationship between the dependent variable; intention to use the mobile fitness app, and independent variable; health belief and perceived enjoyment that is mediated by perceived enjoyment. Therefore, induction of moderator, i.e., gamification, implies that the nature of impacts varies from variable to variable some of them are directly related. In contrast, others harm dependent variable intention to use the mobile fitness app. Therefore, these results are supported by the previous study (Kline, 2015).

To test these relationships among hypotheses, SPSS software was used for testing the effects of mediating, moderating between independent and dependent variables. The consumers are supposed to depict the required behavioral intention to the made decision that is most likely supported by the intention to use the mobile fitness app, based on gamification tactics that increases the purposes of the customer how they react while considering the direct model without the induction of moderator (gamification), shows that perceived enjoyment is mainly caused by health belief and perceived enjoyment while intending to use the mobile fitness app, the gamification shows negative impact in-between perceived enjoyment and intention to use the mobile fitness app. In other words, this result indicates that when consumers have positive and high presence and perception of gamification, consumers' behavioral attributes regarding fitness app use decisions and preference of health-conscious people will be positively increased. Our research findings are according to the self-determination theory, and the impact of our independent variables on the dependent variables is confirmed. As the entire formulated alternate hypotheses of our study are accepted.

After implementing the consumer-centric approach, the customer behavioral intention related to the usage of fitness apps, health belief, and perceived enjoyment became the most crucial element for the pursuit of gamification and entertainment. The health belief of a user and perceived enjoyment hold a significant impact on intention to use the mobile fitness app;

this impact is mediated by perceived enjoyment and moderated by gamification, the greater the perceived entertainment and more the perceived enjoyment approach is used higher intention to use the mobile fitness app by a customer (Pereira et al., 2014c).

Moreover, according to the previous research findings, health consciousness and health belief are the root cause of intention to use the mobile fitness app they both are positively linked to each other, whereas (James et al., 2017) studies support the finding that, health consciousness with perceived enjoyment and intention to use the mobile fitness app is found to be significant for the hypothesis testing. So we can conclude that intention to use the mobile fitness app can be predicted by perceived enjoyment and perceived enjoyment and health belief of fitness app users (N. Ha & Nguyen, 2019).

4.2 Conclusion and Proposals

The ideas presented will help in future research aimed at increasing and supporting consumer intent; this research will help the electronic/mobile app development industry gain insight into consumer preferences, and service providers can use this knowledge to better tailor their offerings to meet the needs of their customers.

This study implies that the managers and developers of fitness apps should be more focused on perceived enjoyment and gamification and start more electronic-based campaigns to maintain the brand image of the fitness apps.

The results of this research will help service providers raise the likelihood that their customers would use their applications by laying out a plan to boost customer happiness. It is suggested that next scholars look into studying people from various regions and cultural backgrounds. Future studies are encouraged to collect opinions based on a specific brand, as this study does not do so. Marketers may use this information to their advantage by realizing they need to offer individualized solutions to keep consumers happy and their bottom lines healthy. Findings from this research provide developers with the parameters necessary to produce an app that conveys the ideal mental picture of their goods and services in the minds of target consumers. The findings of this study have implications for investigation in related fields.

This current research opens the fronts for other researchers to contribute significant innovative ideas related to the electronic industry. This study is beneficial for future researchers in a broader societal context on the impact of trust, complaint handling, heath

consciousness, and customer satisfaction on behavioral intention in terms of other sectors such as banking apps, hospitality apps, and teaching apps and many others. In future research, other variables can be used and topic can be modified and it can also be tested in some other locations with specific fitness apps.

The research finding can be helpful for innovators, for online fitness app developers so they can focus on gamification in their products to gain customer retention and intent to use as these are the powerful tools for changing and maintaining customer's behavioral intention related to the usage of electronic products. Perceived enjoyment ensures productivity in the long term if customers find an excellent front-end image, which will create a good brand image. This study further suggested that it is most important to create customer value to build a firm customer intention to use the app.

4.3 Limitations

Our study, like all others, is done within certain boundaries or limitations, and it is crucial that we adhere to these restrictions; for example, time and resources constraints. However, this in no way lessens the significance of the end result. Not enough resources were available to complete the research. While the scope of this study is limited to students in Lithuania, it does pave the way for future researchers to examine far larger samples from a wider range of countries and cultures.

More study may be done in the future on certain service sectors like the hospitality business, the food service sector, etc. The conclusions of this study are not exclusive to any one business sector. It has broad potential applications in industries as diverse as fast-moving consumer goods (FMCG), textiles, transportation, etc. These limitations provide the basis for future researchers.

REFERENCES

Aldoory, L. (2001). Making health communications meaningful for women: Factors that influence involvement. *Journal of Public Relations Research*, *13*(2), 163–185.

Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. *The International Journal of Information and Learning Technology*.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411.

Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing construct validity in organizational research. *Administrative Science Quarterly*, 421–458.

Baranowski, T., Buday, R., Thompson, D. I., & Baranowski, J. (2008). Playing for real: Video games and stories for health-related behavior change. *American Journal of Preventive Medicine*, *34*(1), 74–82.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173.

Basu, A., & Dutta, M. J. (2008a). The relationship between health information seeking and community participation: The roles of health information orientation and efficacy. *Health Communication*, *23*(1), 70–79.

Basu, A., & Dutta, M. J. (2008b). The relationship between health information seeking and community participation: The roles of health information orientation and efficacy. *Health Communication*, *23*(1), 70–79.

Benabou, R., & Tirole, J. (2003). Intrinsic and extrinsic motivation. *The Review of Economic Studies*, *70*(3), 489–520.

Berkman, L. (2003). Enhancing Recovery in Coronary Heart Disease Patients Investigators (ENRICHD): Effects of treating depression and low perceived social support on

clinical events after myocardial infarction: The Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD) Randomized Trial. *Jama*, *289*, 3106–3116.

Bern, D. J. (1967). An alternative interpretation of cognitive dissonance phenomena. *Psychological Review*, *74*(3), 183–200.

Błach, J. (2010). Financial risk identification based on the balance sheet information. *Managing and Modelling of Financial Risks*, 10–19.

Borgatti, S. P., Everett, M. G., & Freeman, L. C. (2002). Ucinet for Windows: Software for social network analysis. *Harvard, MA: Analytic Technologies*, *6*.

Cappella, E., Kim, H. Y., Neal, J. W., & Jackson, D. R. (2013). Classroom peer relationships and behavioral engagement in elementary school: The role of social network equity. *American Journal of Community Psychology*, *52*(3–4), 367–379.

Chen, Y., Yan, X., & Fan, W. (2015). Examining the effects of decomposed perceived risk on consumer's online shopping behavior: A field study in China. *Engineering Economics*, *26*(3), 315–326.

Cobb, N. K., Graham, A. L., & Abrams, D. B. (2010). Social network structure of a large online community for smoking cessation. *American Journal of Public Health*, *100*(7), 1282–1289.

Dana, L. P., & Dumez, H. (2015). Qualitative research revisited: Epistemology of a comprehensive approach. *International Journal of Entrepreneurship and Small Business*, *26*(2), 154–170. https://doi.org/10.1504/IJESB.2015.071822

Darley, J. M. (1970). *The unresponsive bystander: Why doesn't he help?*

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319–340.

Deci, E. L., & Ryan, R. M. (2012). *Motivation, personality, and development within embedded social contexts: An overview of self-determination theory.*

Deterding, S., Sicart, M., Nacke, L., O'Hara, K., & Dixon, D. (2011). Gamification. Using game-design elements in non-gaming contexts. In *CHI'11 extended abstracts on human factors in computing systems* (pp. 2425–2428).

Divine, R. L., & Lepisto, L. (2005). Analysis of the healthy lifestyle consumer. *Journal of Consumer Marketing*.

Dutta, M. J. (2007). Health information processing from television: The role of health orientation. *Health Communication*, *21*(1), 1–9.

Dutta-Bergman, M. J. (2004). An alternative approach to social capital: Exploring the linkage between health consciousness and community participation. *Health Communication*, *16*(4), 393–409.

Dutta-Bergman, M. J. (2006). A formative approach to strategic message targeting through soap operas: Using selective processing theories. *Health Communication*, *19*(1), 11–18.

Esmaeilzadeh, P. (2021). The Influence of Gamification and Information Technology Identity on Postadoption Behaviors of Health and Fitness App Users: Empirical Study in the United States. *JMIR Serious Games*, *9*(3). https://doi.org/10.2196/28282

Etikan, I. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics*, *5*(1), 1. https://doi.org/10.11648/j.ajtas.20160501.11

Forthofer, M. S., & Bryant, C. A. (2000a). Using audience-segmentation techniques to tailor health behavior change strategies. *American Journal of Health Behavior*, *24*(1), 36–43.

Forthofer, M. S., & Bryant, C. A. (2000b). Using audience-segmentation techniques to tailor health behavior change strategies. *American Journal of Health Behavior*, *24*(1), 36–43.

Frank, K. A., Muller, C., Schiller, K. S., Riegle-Crumb, C., Mueller, A. S., Crosnoe, R., & Pearson, J. (2008). The social dynamics of mathematics coursetaking in high school. *American Journal of Sociology*, *113*(6), 1645–1696.

Furnham, A., & Forey, J. (1994). The attitudes, behaviors and beliefs of patients of conventional vs. Complementary (alternative) medicine. *Journal of Clinical Psychology*, *50*(3), 458–469.

Gao, T., Rohm, A. J., Sultan, F., & Huang, S. (2012). Antecedents of consumer attitudes toward mobile marketing: A comparative study of youth markets in the United States and China. *Thunderbird International Business Review*, *54*(2), 211–224.

Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health*, *31*, 399–418.

Gould, S. J. (1988a). Consumer attitudes toward health and health care: A differential perspective. *Journal of Consumer Affairs*, *22*(1), 96–118.

Gould, S. J. (1988b). Consumer Attitudes Toward Health and Health Care: A Differential Perspective. *Journal of Consumer Affairs*, *22*(1), 96–118. https://doi.org/10.1111/j.1745-6606.1988.tb00215.x

Gould, S. J. (1990). Health consciousness and health behavior: The application of a new health consciousness scale. *American Journal of Preventive Medicine*, *6*(4), 228–237.

Ha, J.-P., Kang, S. J., & Ha, J. (2015). A conceptual framework for the adoption of smartphones in a sports context. *International Journal of Sports Marketing and Sponsorship*.

Ha, N., & Nguyen, T. (2019). The effect of trust on consumers' online purchase intention: An integration of TAM and TPB. *Management Science Letters*, *9*(9), 1451–1460.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long Range Planning*, *46*(1–2), 1–12.

Hong, H. (2009). *Scale Development for Measuring Health Consciousness: Re-conceptualization*. 212–263.

Hong, Y., Lam, J. W., & Tang, B. Z. (2011). Aggregation-induced emission. *Chemical Society Reviews*, *40*(11), 5361–5388.

Huber, K. V., Salah, E., Radic, B., Gridling, M., Elkins, J. M., Stukalov, A., Jemth, A.-S., Göktürk, C., Sanjiv, K., & Strömberg, K. (2014). Stereospecific targeting of MTH1 by (S)-crizotinib as an anticancer strategy. *Nature*, *508*(7495), 222–227.

Iversen, A. C., & Kraft, P. (2006). Does socio-economic status and health consciousness influence how women respond to health related messages in media? *Health Education Research*, *21*(5), 601–610.

James, N. D., de Bono, J. S., Spears, M. R., Clarke, N. W., Mason, M. D., Dearnaley, D. P., Ritchie, A. W., Amos, C. L., Gilson, C., & Jones, R. J. (2017). Abiraterone for prostate cancer not previously treated with hormone therapy. *New England Journal of Medicine*, *377*(4), 338–351.

Jayanti, R. K., & Burns, A. C. (1998). The antecedents of preventive health care behavior: An empirical study. *Journal of the Academy of Marketing Science*, *26*(1), 6. https://doi.org/10.1177/0092070398261002

Johnson, D., Deterding, S., Kuhn, K.-A., Staneva, A., Stoyanov, S., & Hides, L. (2016). Gamification for health and wellbeing: A systematic review of the literature. *Internet Interventions*, *6*, 89–106.

Kaskutas, L. A., & Greenfield, T. K. (1997). The role of health consciousness in predicting attention to health warning messages. *American Journal of Health Promotion*, *11*(3), 186–193.

Kaynak, R., & Ekşi, S. (2014). Effects of personality, environmental and health consciousness on understanding the anti-consumptional attitudes. *Procedia-Social and Behavioral Sciences*, *114*, 771–776.

Klaus, P., & Nguyen, B. (2013). Exploring the role of the online customer experience in firms' multi-channel strategy: An empirical analysis of the retail banking services sector. *Journal of Strategic Marketing*, *21*(5), 429–442.

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. Guilford publications.

Latkin, C., Donnell, D., Celentano, D. D., Aramrattna, A., Liu, T.-Y., Vongchak, T., Wiboonnatakul, K., Davis-Vogel, A., & Metzger, D. (2009). Relationships between social norms, social network characteristics, and HIV risk behaviors in Thailand and the United States. *Health Psychology*, *28*(3), 323.

Luna-Reyes, L. F., Hernández García, J. M., & Gil-García, J. R. (2009). Hacia un modelo de los determinantes de éxito de los portales de gobierno estatal en México. *Gestión y Política Pública*, *18*(2), 307–340.

Maher, A. A., & Carter, L. L. (2011). The affective and cognitive components of country image: Perceptions of American products in Kuwait. *International Marketing Review*.

McKay, F. H., Wright, A., Shill, J., Stephens, H., & Uccellini, M. (2019). Using health and well-being apps for behavior change: A systematic search and rating of apps. *JMIR MHealth and UHealth*, *7*(7), e11926.

Meng, F., Guo, X., Peng, Z., Zhang, X., & Vogel, D. (2019). The routine use of mobile health services in the presence of health consciousness. *Electronic Commerce Research and Applications*, *35*, 100847.

Michaelidou, N., & Hassan, L. M. (2008). The role of health consciousness, food safety concern and ethical identity on attitudes and intentions towards organic food. *International Journal of Consumer Studies*, *32*(2), 163–170.

Miyamoto, Y., & Sono, T. (2012). Lessons from peer support among individuals with mental health difficulties: A review of the literature. *Clinical Practice and Epidemiology in Mental Health: CP & EMH*, *8*, 22.

Mundt, M. P., Mercken, L., & Zakletskaia, L. (2012). Peer selection and influence effects on adolescent alcohol use: A stochastic actor-based model. *BMC Pediatrics*, *12*(1), 1–10.

Pappu, R., Quester, P. G., & Cooksey, R. W. (2007). Country image and consumer-based brand equity: Relationships and implications for international marketing. *Journal of International Business Studies*, *38*(5), 726–745.

Parker, S. (2011). *Advancing the Field of Health Games: A Progress Report on Health Games Research*.

Pereira, P., Duarte, E., Rebelo, F., & Noriega, P. (2014a). *A review of gamification for health-related contexts*. 742–753.

Pereira, P., Duarte, E., Rebelo, F., & Noriega, P. (2014b). *A review of gamification for health-related contexts*. 742–753.

Pereira, P., Duarte, E., Rebelo, F., & Noriega, P. (2014c). *A review of gamification for health-related contexts*. 742–753.

Personal effectiveness: 10 traits. (2020, August 9). *CDL Insight*. http://www.learning-mind.com/7-basic-personal-effectiveness-skills/

Peter, J. P., & Tarpey Sr, L. X. (1975). A comparative analysis of three consumer decision strategies. *Journal of Consumer Research*, *2*(1), 29–37.

Ramírez-Ortiz, G., Caballero-Hoyos, R., Ramírez-López, G., & Valente, T. W. (2012). The effects of social networks on tobacco use among high-school adolescents in Mexico. *Salud Pública de México*, *54*, 433–441.

Rogers, A., Brooks, H., Vassilev, I., Kennedy, A., Blickem, C., & Reeves, D. (2014). Why less may be more: A mixed methods study of the work and relatedness of 'weak ties' in supporting long-term condition self-management. *Implementation Science*, *9*(1), 1–11.

Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation analysis in social psychology: Current practices and new recommendations. *Social and Personality Psychology Compass*, *5*(6), 359–371.

Ryan, R. M., Huta, V., & Deci, E. L. (2008). Living well: A self-determination theory perspective on eudaimonia. *Journal of Happiness Studies*, *9*(1), 139–170.

Schmidt-Kraepelin, M., Warsinsky, S., Thiebes, S., & Sunyaev, A. (2020). *The role of gamification in health behavior change: A review of theory-driven studies*. Proceedings of the 53rd Hawaii International Conference on System Sciences.

Schweitzer, L., & Noblet, J. (2018). Water contamination and pollution. In *Green chemistry* (pp. 261–290). Elsevier.

Shalizi, C. R., & Thomas, A. C. (2011). Homophily and contagion are generically confounded in observational social network studies. *Sociological Methods & Research*, *40*(2), 211–239.

Shergill, G. S., & Chen, Z. (2005). WEB-BASED SHOPPING: CONSUMERS'ATTITUDES TOWARDS ONLINE SHOPPING IN NEW ZEALAND. *Journal of Electronic Commerce Research*, *6*(2), 78.

Shim, M., Kelly, B., & Hornik, R. (2006). Cancer information scanning and seeking behavior is associated with knowledge, lifestyle choices, and screening. *Journal of Health Communication*, *11*(S1), 157–172.

Statista. (2018). Number of Mobile App Downloads Worldwide in 2017, 2018 and 2022 (in Billions). *The Statistics Portal*.

Stevens, G., Mascarenhas, M., & Mathers, C. (2009). Global health risks: Progress and challenges. *Bulletin of the World Health Organization*, *87*, 646–646.

Stocchi, L., Michaelidou, N., & Micevski, M. (2019). Drivers and outcomes of branded mobile app usage intention. *Journal of Product & Brand Management*.

Tabacchi, M. H. (1987). Targeting the health-conscious consumer. *Cornell Hotel and Restaurant Administration Quarterly*, *28*(3), 21–24.

Teixeira, P. J., Silva, M. N., Mata, J., Palmeira, A. L., & Markland, D. (2012). Motivation, self-determination, and long-term weight control. *International Journal of Behavioral Nutrition and Physical Activity*, *9*(1), 1–13.

Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior*, *52*(2), 145–161.

Thorne, S. (1993). Health belief systems in perspective. *Journal of Advanced Nursing*, *18*(12), 1931–1941.

Valente, T. W. (2012). Network interventions. *Science*, *337*(6090), 49–53.

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 157–178.

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. *Nursing Research*, *36*(2), 76–81. https://doi.org/10.1097/00006199-198703000-00002

Wixom, B. H., & Watson, H. J. (2001). An empirical investigation of the factors affecting data warehousing success. *MIS Quarterly*, 17–41.

Woolf, S. H. (2008). The meaning of translational research and why it matters. *Jama*, *299*(2), 211–213.

Wouters, P., Van Nimwegen, C., Van Oostendorp, H., & Van Der Spek, E. D. (2013). A meta-analysis of the cognitive and motivational effects of serious games. *Journal of Educational Psychology*, *105*(2), 249.

Yadav, R., & Pathak, G. S. (2017). Determinants of consumers' green purchase behavior in a developing nation: Applying and extending the theory of planned behavior. *Ecological Economics*, *134*, 114–122.

Yuan, S., Ma, W., Kanthawala, S., & Peng, W. (2015). Keep using my health apps: Discover users' perception of health and fitness apps with the UTAUT2 model. *Telemedicine and E-Health*, *21*(9), 735–741.

Zhang, Y., Liu, T., Meyer, C. A., Eeckhoute, J., Johnson, D. S., Bernstein, B. E., Nusbaum, C., Myers, R. M., Brown, M., & Li, W. (2008). Model-based analysis of ChIP-Seq (MACS). *Genome Biology*, *9*(9), 1–9.

Zichermann, G., & Cunningham, C. (2011). *Gamification by design: Implementing game mechanics in web and mobile apps*. O'Reilly Media, Inc.

Summary

The purpose of this study was to investigate the relationship between health beliefs and the intention to use a mobile fitness app, with the expectation that pleasure would operate as a moderator of the effect and enjoyment itself serving as a mediator of the effect. The theoretical part comprises of the theoretical aspects of health consciousness health belief and gamification as moderator, Dimensions of health consciousness, Network Interventions and Health Belief, Social Support and health belief, Intention to use health fitness application. All of the variables of current study are linked with respect to the theory of Reasoned Action, Innovation & Diffusion theory and Unified Theory of Acceptance & Use of Technology Model. The technique of study that is employed is called quantitative. The population of university students was used as a source for the sample size of 377 users for the study, and simple random convenience sampling was used to choose them. The research was carried out in Lithuania, where a significant number of individuals use fitness applications. In order to carry out the study, structural equation modelling was an essential tool. The impacts of moderating and mediating the relationship between dependent and independent variables were investigated with the help of the SPSS software. The findings indicate that there is a robust association between the dependent variable (intention to use the mobile fitness app) and the independent variable (health beliefs) and perceived enjoyment, which is mediated by perceived enjoyment. This association exists between the dependent variable and the independent variable. Therefore, the introduction of the moderator, gamification, suggests that the nature of the impacts varied from variable to variable; while some of the impacts were directly related to the dependent variable, the user's intention to use the mobile fitness app, others had a negative impact on intension to use mobile fitness app.

APPENDIX

Gender: (1) Male (2) Female

Age:

(1) 16 years to 20 years

(2) 21 years to 30 years

(3) 31 years to 40 years

(4) 41 years to 50 years

(5) 51 years and above

Education: (1) Graduation, (2) Post-graduation, (3) High-school, (4) Other

Monthly Income:

(1) Less than 500 EUR
(2) 501 - 1000 EUR
(3) 1001-1500 EUR
(4) More than 1501 EUR

Please read each descriptive statement carefully and indicate your degree of agreement or disagreement by selecting the appropriate option when, 1=strongly disagree; 5="strongly agree". Allow yourself to remember that your answer will be kept confidential and used only for research purposes.

Strongly Disagree	**Disagree**	**neutral**	**Agree**	**Strongly Agree**
1	**2**	**3**	**4**	**5**

Health Consciousness					
Self-Health Awareness	1	2	3	4	5

I'm very self-conscious about my health.					
I'm generally attentive to my inner feelings about my health.	1	2	3	4	5
I reflect about my health a lot.	1	2	3	4	5
I'm concerned about my health all the time.	1	2	3	4	5
Personal Responsibility I notice how I feel physically as I go through the day.	1	2	3	4	5
I take responsibility for the state of my health.	1	2	3	4	5
Good health takes active participation on my part.	1	2	3	4	5
I only worry about my health when I get sick.	1	2	3	4	5
Health Motivation Living life without disease and illness is very important to me.	1	2	3	4	5
My health depends on how well I take care of myself.	1	2	3	4	5
Living life in the best possible health is very important to me.	1	2	3	4	5
By keeping in mind the in-built fitness app in your mobile phone, you used in the last 6 month, please encircle the appropriate option as per your opinion when, 1=strongly disagree; 5="strongly agree"					
Perceived Enjoyment					
The mobile fitness app is interesting.	1	2	3	4	5
The mobile fitness app made me feel enjoyable.	1	2	3	4	5
The mobile fitness app is a good way to spend my leisure time.	1	2	3	4	5
The mobile fitness app involves me in an enjoyable process.	1	2	3	4	5
Health Belief					
My doctor believes that I should use a mobile fitness app.	1	2	3	4	5
I believe that mobile fitness app is very significant to have a good health	1	2	3	4	5
Perceived Gamification mechanism					

I think that the in-built fitness app has badges to identify and reward individual achievements.	1	2	3	4	5
I believe the in-built fitness app has leaderboards to rank individual user progress and achievements as compared to other peers	1	2	3	4	5
I think that the in-built fitness app has a points and levels mechanism to earn points for completing different levels	1	2	3	4	5
I believe that the in-built fitness app has challenges and quests through competition	1	2	3	4	5
I think that the in-built fitness app tells me what I have accomplished lately through feedback	1	2	3	4	5
I believe the in-built fitness app has social engagement loops through social media profiles	1	2	3	4	5
Intention to use mobile fitness app					
I intend to continue using the fitness app.	1	2	3	4	5
I want to continue using the fitness app rather than discontinue it.	1	2	3	4	5
I predict I will continue using the fitness app.	1	2	3	4	5
I plan to continue using the fitness app.	1	2	3	4	5