Faculty of Human Kinetics – University of Lisbon

Physical activity promotion in the Portuguese pharmacies: A survey of knowledge, attitudes and behaviors of pharmacists

Rúben Emanuel Gonçalves Viegas Custódio

Dissertation for the degree of Master in Physical Exercise and Health

Supervised by:
Pedro Teixeira, PhD
Cristina Godinho, PhD

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Declaration of copyright

I declare to be the author of this research and dissertation that is original. Papers and articles are quoted in the text and are listed in the references at the end of this project.

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Resumo

A inatividade física apresenta-se como um obstáculo para se atingirem populações mais saudáveis. Como tal, cada vez mais os sistemas de saúde e os seus profissionais desempenham um papel fundamental na promoção e manutenção de comportamentos que visem níveis de atividade física mais elevados. O presente estudo pretendeu caraterizar a promoção de atividade física por parte dos farmacêuticos no contexto das farmácias Portuguesas.

Para caraterizar a promoção de atividade física, foi desenvolvido um questionário com base num questionário semelhante ao desenvolvido para a classe médica em Portugal, bem como pelo modelo de mudança comportamental "COM-B" e pelo *Theoretical Domains Framework*. Este estudo foi desenvolvido em parceria com a Associação Nacional das Farmácias (ANF), que colaborou ativamente na distribuição dos questionários aos farmacêuticos.

No total obtiveram-se 396 respostas completas, o que representa cerca de 5% dos farmacêuticos Portugueses. A amostra foi composta por 86 homens (18,4%) e 381 mulheres (81,6%), com idade média de 40,0 anos (DP = 10,0), com 14,3 anos (DP= 9,0) de experiência em farmácia comunitária. Cerca de 80 % dos farmacêuticos respondeu que promove atividade física na sua rotina diária. O tipo de iniciativa de promoção de atividade física mais referido foi o aconselhamento verbal, com cerca de 90% de respostas e a caminhada a atividade física mais aconselhada, com 95% de respostas. Mais de 90% dos farmacêuticos acredita que a promoção de atividade física para a saúde e a sua promoção nas farmácias é importante ou muito importante.

As principais barreiras referidas foram as oportunidades de promoção, como a falta de tempo, recursos ou interesse por parte dos utentes. Por outro lado, as capacidades, na forma de conhecimento e a motivação, na forma de interesse pela promoção e a definição do papel do farmacêutico como promotor de atividade física apresentam-se como barreiras menores.

Através da análise deste questionário pretendeu-se entender as possibilidades de incluir as farmácias e os farmacêuticos como promotores de atividade física nos cuidados de saúde primários no futuro.

Palavras-chave: Atividade física, farmacêuticos, promoção, cuidados de saúde primários, farmácias.

Abstract

Physical inactivity represents an obstacle to healthier populations. Health systems and their professionals play a key role in the promotion and maintenance of behaviors contributing to higher levels of physical activity. Hence, the present study aimed to characterize physical activity promotion actions of pharmacists taking place in Portuguese pharmacies.

To characterize physical activity promotion, a questionnaire was developed based on a similar questionnaire developed for the medical class in Portugal and supported by the behavioral change models/ frameworks such as the COM-B and Theoretical Domains Framework. This study was developed in partnership with the National Pharmacies Association (ANF) that actively collaborated in the distribution of questionnaires to the pharmacists.

In total, 396 complete responses were obtained, representing about 5% of Portuguese pharmacists. The sample consisted of 86 men (18.4%) and 381 women (81.6%), with a mean age of 40 (SD = 10) years and 14.3 (SD = 9) years of experience in community pharmacy. About 80% of pharmacists responded they promote physical activity in their daily routine. The most frequent promotion action was verbal counseling, with about 90% of responses and walking the most advised activity, with 95% of responses. More than 90% of pharmacists believe that the promotion of physical activity for health and its promotion in the pharmacy is important or very important.

The main barriers encountered were the promotion opportunities, such as lack of time, resources or interest by costumers. On the other hand, capacities, such as knowledge and motivation, such as interest for promotion and definition of the role of the pharmacist as promotor of physical activity presented themselves as minor barriers.

Through the analysis of this questionnaire we intended to understand the possibilities of including pharmacies and pharmacists as promoters of physical activity in the primary health care in the future.

Keywords: physical activity, pharmacists, promotion, primary care, pharmacies.

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Abbreviations

ANF – Associação Nacional das Farmácias
CDC – Centre for Disease Control and Prevention
CEFAR - Centre for Studies and Evaluations in Health
DGS - Portuguese Directorate-General of Health
EU – European Union
GAPPA - Global Action Plan for Physical Activity
HEPA – Health Enhancing Physical Activity
IPAQ – International Physical Activity Questionnaire
IPDJ - Portuguese Institute for Sports and Youth
NCD – Non-Communicable Disease
NICE - National Institute for Health and Care Excellence
PAPRICA - Physical Activity Promotion in PRImary Care
SDG - Sustainable Development Goals
SPMS - Shared Services of the Ministry of Health
WHO - World Health Organization

1. Introduction

Physical activity has many benefits for health. Its positive effects are present in many different pathologies that help these conditions to improve and increase quality of life for the patients. Besides that, there are also many benefits associated with prevention of conditions through physical activity, documented already almost 30 years ago (Kendrick, Williamson, & Caspersen, 1991).

Although the benefits are clear, the most recent data from the Eurobarometer (European Comission, 2018) shows that the levels of physical inactivity are still very high and there is still much to do in regards of promotion.

The healthcare sector is of extreme importance for the promotion of physical activity as many patients could feel the benefits of regular physical activity. Regarding physical activity promotion in the healthcare systems the Global Action Plan for Physical Activity 2018-2030 (World Health Organization., 2018) is one of the main references followed globally by countries.

Various socioeconomic factors play a role in the levels of physical activity and are thus important to determine why some individuals are more active than others (Almeida, 2005).Among the environmental factors, accessibility, aesthetics and opportunity seem to have a significant relationship with the amount of physical activity. Other factors related to safety, weather or even the infrastructures are also associated with increased physical activity. All these aspects seem to influence the levels of physical activity that individuals are able to do (Humpel, Owen, & Leslie, 2002).

Although the current practices in the healthcare systems don't have prevention as their main focus, research clearly points out the benefits of having a healthy lifestyle, namely by adherence to healthy dietary patterns and good levels of physical activity (E. M. Matheson, King, & Everett, 2012). Due to the increased prevalence of non-communicable diseases, the need to look for prevention and changes in lifestyles is a vital investment that needs to be done (World Health Organization., 2005). In order to reach more people in the health systems, healthcare professionals in direct contact

with patients can have an important influence over their behaviours through advice and follow up (Bullock & Lawrence, 2015).

When looking into primary healthcare as a setting and to the different healthcare professionals, we find pharmacies and pharmacists as one of the most available and widespread resources to the patient. Many times, pharmacies are also the first contact patients have with the healthcare system. Pharmacists are trained health professionals with a strong educational background that may be used as means to convey messages related to lifestyle choices, including general advice and support for the practise of physical exercise (Hassell, Ma, Anne, Frpsgb, & Hassell, 2000). However, little is known regarding the initiatives and practices on physical activity promotion currently performed in the Portuguese pharmacies.

This research aims to characterise the physical activity promotion actions conducted in the Portuguese community pharmacies and to understand the factors that influence the promotion of physical activity by pharmacists' in their daily routine. This will be an important first step to reveal what can be done to better promote physical activity in the pharmacy context.

The first chapter is composed by an introduction and overview of the topic of physical activity promotion. In chapter two the focus one is given to physical activity, the impact it can have in health and the need for promotion facing the high levels of physical inactivity. In the third chapter the focus is the physical activity in the health systems, the initiatives for health promotion in primary care, and the pharmacies and pharmacists as promotors of physical activity.

2. Background: Physical activity for health promotion

2.1. Physical activity: definition and overview

To understand the concept of physical activity we need to travel back to ancient Greece, where Hippocrates mentions the word exercise in his research, recognising its therapeutic value on improving mental health, muscle condition and as a tool for recovering from different conditions. Hippocrates also mentioned that several types of physical activity existed: Walking as a natural exercise, running that improved physical condition, resistance and muscle condition and different kinds of gymnastics and fights (Toscano, 2008).

Since ancient times, the concept of physical activity evolved and is now considered as part of our everyday lives. The term physical activity can be defined as "any bodily movement produced by skeletal muscles that results in energy expenditure" (Roy J Shephard & Balady, 2000). Physical activity is part of the daily routine of every human being. It includes recreational activities, such as walking, dancing or sports, transportation and occupational, work-related activity and also all types of games, sports or planned exercise (Roy J Shephard & Balady, 2000). Although some definitions can be different due to the wide range of activities that can be included in physical activity, there is some consensus in the definition mentioned above. It is as wide as every movement that includes strength, even posture. This means that standing includes more physical activity than sitting and running more than walking (R J Shephard, 2003).

There are four main domains according to which we can define physical activity: type, duration, frequency and intensity. The type might be cardiovascular, resistance or strength, the duration considers how much time the activity lasts, the intensity the amount of effort or work and the frequency the number of times the activity is performed. Taking all of these into account, the frequency is one of the main important variables to take into account as it is of highest importance to have individuals moving, even for a short period of time and even engaging in low intensity activities (Cachapuz, C., Calejo, S. & Maia, 1999). Some physical activity is better than none and every minute counts (U.S. Department of Health and Human Services, 2018).

Guidelines for physical activity recommend at least 150 minutes a week of moderate intensity or 75 minutes a week of vigorous of aerobic activity, or a combination of both (WHO, 2010). It can be done in bouts of 10 minutes and preferably throughout the week. It is also recommended to perform muscle strengthening activities involving all major muscle groups, 2 or more days per week, to increase physical activity related benefits (U.S. Department of Health and Human Services, 2008).

In order to increase the levels of physical activity simple habits need to be adopted. These habits can influence the health-related outcomes of the individual's health. An important aspect is that the type of physical activity is important and not only its quantity (Mullen, Heesch, Masse, Dunn, & Frankowski, 2003). To develop such habits, there is a need to learn how to keep these habits regularly and to develop competencies and a lot of social factors that can influence the levels of physical activity in different social spheres (Laakso, 1996).

Physical activity can be used to improve health in general, but the maintenance of physical activity levels seems, however, to be a challenge. The maintenance of physical activity levels is essential for sustained health outcomes, but what are the long-term health gains of being active?

2.2. Impact of Physical activity in health

Physical activity gains relevance when applied to public health, as it is a way to influence health outcomes. It contributes for our energy balance, as we can expend calories to balance with the calories we get from food. It also has a very important role in body composition, allowing our bodies to have better insulin sensitivity, immune response and psychological well-being (Miles, 2007). Physical exercise seems to be an important tool to prevent cardiovascular disease, as it produces a series of benefits that include improvement in exercise capacity, improvement in lipid profile, reduction in inflammation and obesity in the context of cardiac rehabilitation (Swift et al., 2013).

A large body of evidence exists supporting the notion that physical activity produces several major health benefits. Regular physical activity is associated with a reduction in all-cause mortality, improving of risk factors and better quality of life. All the benefits mentioned above can also reduce costs associated to the burden in the healthcare systems (Lefebvre & Reeder, 2015).

Besides its preventive role, physical activity can be compared to pharmacological treatment in some contexts. In twenty six different chronic diseases there is evidence that physical activity is capable of improving a patient's health when integrated in treatment plans of these conditions (Pedersen & Saltin, 2015). One example is cancer care, where physical activity improved physical function and quality of life (Buffart et al., 2017). Some other conditions where we can find benefits in physical condition are multiple sclerosis, rheumatoid arthritis and lupus, where a significant correlation between low impact aerobic exercise and fatigue reduction was found (Neill, Belan, Ried, & Neill, 2006).

Regarding psychological disorders, such as depression, exercise seems to improve this condition as active people are less likely to be depressed (Blumenthal, Smith, & Hoffman, 2013). In the effects on blood pressure, significant control of blood pressure was achieved through a physical activity program (Bündchen, Schenkel, Santos, & Carvalho, 2013). Following the recommended guidelines seems to have a great

impact in the reduction of fat body mass, body mass index and glucose levels (Lauer, Jackson, Martin, & Morrow, 2017).

2.3. Prevalence of physical inactivity and the need for activity promotion

Despite all the aforementioned benefits, physical inactivity is still pervasive. In Europe, according to the Eurobarometer data, only two in five Europeans exercise or play sports at least once a week and 46% never do it (42% in 2013). Men seem to do more exercise than women, especially between 15-24 years old and numbers drop as the age increases. The levels of physical activity also drop in groups with lower levels of education and people with financial difficulties (European Comission, 2018).

Regarding sitting time, 12% of the Europeans sit for more than 8.5 hours per day and 69% spend 2.5 to 8.5 hours per day sitting. Also, 15% of Europeans do not walk for 10 minutes at a time at all in a weekly period. In this same period, 58% do not engage in any vigorous activity and 47% in any moderate activity (European Comission, 2018). The groups of people that tend to be more inactive are older adults, women and people from wealthier countries (Hallal, Andersen, Bull, Guthold, & Haskell, 2012). In a study conducted in Norway, where levels of physical activity were measured with accelerometers, 62% of the study sample spent their time being sedentary and one in five people did not met the national physical activity requirements (Anderssen & Holme, 2011).

Still according to the European Commission Eurobarometer the reasons people engage in a sport or physical activity are to improve health (54%), improve fitness (47%), relax (38%), have fun (30%) and improve physical performance (28%). Most respondents (74%) agree that there are many opportunities to be active in their local area and 73% think their local sport clubs and others provide enough opportunities (European Comission, 2018). Portugal is in the group of the least likely to exercise or play sports (68% never do it). Also, 79% of the respondents referred to not having done any vigorous activity the previous week. In fact, Portugal is one of the countries with the lowest scores in several categories related to physical activity (European Comission, 2018).

These numbers show that only a small part of the population engages in the recommended guidelines and that physical inactivity levels are very high. When referring to adolescents, the levels were also low (13,3%) and boys were much more active than girls (18,5% compared to 8,8%) (European Comission & WHO, 2016).

In Portugal, the percentage of people that fit in the category of "active" (over 14 years old), measured by the International Physical Activity Questionnaire (IPAQ) (Booth, 2002): 32,8% in the north, 28,5% in the center, 19,8% in the south (Alentejo and Algarve), 21% in Lisbon, 29,1% in Madeira and 33,2% in Açores (IAN-AF, 2018a).

The prevalence of sedentary behavior is also quite high: 36,3% in the North, 44,4% in the Center, in the south Alentejo (51%) and Algarve (46,6%), 47,5% in Lisbon, 36,4% in Madeira and 39% in Açores (IAN-AF, 2018b). Considering these data, it is clear that there is a huge need to promote active lifestyles. Physical inactivity should be avoided, as it is recognized that even some activity is better that none and even low levels of activity lead to health benefits.

Referring to the economic burden, the direct costs of physical inactivity in different countries are estimated to range from 0.3% (England) (Public Health England, 2016) to 4.6% (New Zealand) (Auckland Council, Waikato Regional Council, & Wellington Regional Strategy Committee, 2013) of the respective national healthcare expenditure (Ding et al., 2017). In Australia, the burden of physical inactivity combined with overweight and obesity was 9%, at the same level of tobacco, the leading health risk in this country. Physical inactivity also contributed for some conditions: 19% for diabetes, 16% for cancer, 14% for dementia and 10% for stroke and coronary heart disease (Australian Institute of Health and Welfare, 2017).

Physical inactivity is related to several barriers. Some barriers to physical exercise in obese patients include lack of time, tiredness, weight regain, weather, boredom and injuries (Andersen & Jakicic, 2009). These barriers affect not only adults but also the younger population. In high school students, time constraints due to school work, other interests and family activities were considered the most important barriers to physical activity practice. The perceived barriers were higher in females (Allison et al., 1999). In working mothers and fathers, family responsibilities, lack of support, work, guilt and

scheduling constraints were the most cited barriers (Mailey, Huberty, Dinkel, & Mcauley, 2014). In the Eurobarometer (European Comission, 2018), lack of time was also the main reason not to practise more physical activity (40%), followed by lack of motivation or interest (20%) and having a disability or illness (14%).

Personal determinants influencing physical activity levels have been stressed, such as age, sex, health status, self-efficacy and previous physical activity. New research also identified genetics and evolutionary biology as other factors that might shape behaviours in populations (Bauman et al., 2012). In community programs, the importance of physical activity can be seen for example in reducing depressive symptoms in older participants (Tsuji, Miyaguni, Kanamori, Hanazato, & Kondo, 2017). Also in the older populations it seems that an approach supported by behavioural theories produces a better effect, suggesting that the promotion of physical activity is related with behavioural aspects such as peer bonding and social networks (Olanrewaju, Kelly, Cowan, Brayne, & Lafortune, 2016).

There are also many other factors that influence physical activity levels besides physical health or psychological health and those include how many hours we sit a day, functional ability, mental health and employment status. All these factors are important to assess when recommending physical activity, as the identification of specific modifiable factors may alert to the need to modify them in order to have better targeted health promotion strategies (Mckee, Kearney, & Kenny, 2014).

The high levels of physical inactivity are being tackled through many strategies that include applied research on physical activity and the integration of theories across social, behavioural and biomedical disciplines (Sparling, Owen, Lambert, & Haskell, 2000). This can also be achieved through the increase of studies focused more on practical interventions in the area of physical activity (Dzewaltowski, Estabrooks, & Glasgow, 2004). The need for physical activity promotion should be tackled in a multidisciplinary way, including the nutritional sciences and the major stakeholders in health, such as governments and policy makers, as the main partners. All of them need to take this cooperative approach into consideration to be able to implement effective measures regarding changes in lifestyle and in physical activity promotion (Pronk & Remington, 2015; Reis et al., 2016). Without an integrated and multisectoral

approach to physical activity promotion it will be hard to implement effective promotion measures in healthcare systems settings and involve healthcare professionals as physical activity promoters.

Health promotion efforts can be targeted to large populations and to multiple interventions. These can be done in different settings (as schools, workplace, etc.) and therefore address the health determinants (behaviours, beliefs, etc.) that take part of this setting and that might facilitate the integration of health promotion actions (Kumar & Gs, 2012). Sports England findings point out that behavioural change theories are very welcomed, and potential change needs to be measured as well as the interventions' impact. One of the ways to do this could be by reinforcing sports and activity as the norm and eventually a change will happen in the social scale (Sport England, 2016).

When we look at the best investments we can make regarding physical activity we find several priorities that need to be addressed. A major concern is related to education, either in the way of public education, including the correct use of social media, or in the schools targeting the younger generations, including having more physical activity in schools (Schiphorst, Murray, Kelly, Oliver, & Bull, 2017). According to the most recent factsheet on promoting physical activity in the education sector, all 28-member states provide physical education classes in schools. Twenty countries reported that the all the number of hours of physical education for primary school were mandatory and twenty-one reported the same for high schools. For the monitoring of the quality of physical education, 20 countries reported they do it actively. Lastly, regarding the teachers' education, twenty one countries have training in health enhancing physical activity either in a mandatory or optional module (WHO Regional Office for Europe, 2018a).

The current panorama of occupational and domestic activities and transportation, with all the technologies available, is one that requires less energy expenditure than ever. This is the same as saying that physical activity related to these tasks and to active transport is insufficient for most populations (Lee et al., 2013). The urban design and infrastructure should provide safe access to recreational activities. The transport policies should also prioritise walking, cycling and the use of public transport as main focus (Schiphorst et al., 2017). A Belgian study (BEPAS Seniors) findings suggest that a high neighbourhood walkability relates to higher levels of older adults' transport-related walking. In this age group it is important to provide sufficient destinations and pedestrian-friendly facilities in order to have an accessible and affordable way of increasing the levels of physical activity (Holle et al., 2014).

Last, and the one that concerns this research the most, is the use of healthcare and healthcare education as ways for ensuring the assessment and advice about physical activity are included as a routine part of the healthcare services (Schiphorst et al., 2017). It is also important to look at the good practices and policies regarding the promotion of physical activity, in order to understand how it would be possible to implement them across countries (Horodyska et al., 2015). In the United States of America, as an example, The Centre for Disease Control and Prevention (CDC) set some strategies regarding the promotion of physical activity in the community. These include community-wide campaigns, encouraging the use of stairs, behavioural change programs, school-based physical education, social support interventions in community settings, access to place for physical activity, scale urban designs and active transport to school (Centers for Disease Control and Prevention, 2011).

3. Physical activity in healthcare systems

3.1. Importance of physical activity promotion in the healthcare systems

The Global Action Plan for Physical Activity (GAPPA) 2018 – 2030 (World Health Organization, 2018) aims to reduce physical inactivity by 15% by 2030, according to several Sustainable Development Goals (SDGs). This can be achieved through four main objectives: creating active societies, active environments, active people and active systems (World Health Organization., 2018).

According to point 3.2 of the GAPPA, there is a need to implement and strengthen systems of patient assessment and counselling on increasing physical activity. This change is needed to allow the access to opportunities and programmes across the different settings with the goal of reducing sedentary behaviour, by appropriately trained healthcare providers and others. In primary and secondary health care ensuring community and patient involvement and coordinated links with community resources is one target that allows the involvement of healthcare systems in the promotion of physical activity (World Health Organization., 2018).

The World Health Organization (WHO) has also highlighted the importance of reducing physical inactivity for tackling Non-Communicable Diseases (NCD). Some of the referred "Best buys" for physical activity promotion are the implementation of community wide public education and awareness campaigns, including mass media and motivational and environmental programs. Another important recommendation is to include physical activity counselling and referral as part of the primary care services, using brief interventions as a routine (WHO, 2017).

An important note in this subject is the concept of Health-Enhancing Physical Activity (HEPA). When looking to the European Union (EU) and to a set of 23 indicators provided by the Council of the European Union (European Comission, 2013), the ones that need more investment in the present moment are the "Senior Citizens" sector followed by the "Work Environment" and the "Environment, Urban Planning and Public Safety" sectors (Breda et al., 2018).

To be able to have structures and contacts at an international level, the HEPA Europe group was developed as a European network on promotion of HEPA. The network is closely following the WHO regional office for Europe in order to establish population-based approaches for the promotion of HEPA, using the best-available scientific evidence (Brian W Martin et al., 2006).

Some examples of activities regarding healthcare systems included in the HEPA groups are the PAPRICA (Physical Activity Promotion in PRImary Care) in Switzerland (Brian W; Martin et al., 2014), the National Exercise Referral Scheme in Wales (Murphy et al., 2012), among others (Ward, 2016).

The most recent factsheets on promoting physical activity in the health sector point out that twenty-one out of the 28 EU member state countries have a national program or scheme to promote counselling on physical activity for health by health professionals. Only in 7 countries there is reimbursement in this kind of counselling related to physical activity by the national health insurance system. Lastly, regarding training on physical activity in the curriculum of the healthcare professionals, we see that 21 countries provide it for medical doctors, 17 countries for nurses, 17 countries for physiotherapists and 11 for other health professionals such as nutritionists, occupational therapists, kinesiologists and pharmacists (WHO Regional Office for Europe, 2018b). How can the healthcare professionals working in primary care be more involved in promoting physical activity?

3.2. Initiatives for health promotion in primary healthcare

Physical activity promotion can start with simple initiatives. An initiative can be understood as a combined effort of health stakeholders that aims to improve the health and the wellbeing of people. Some examples of this kind of initiatives are counselling, advertising, services provision or awareness campaigns (Geller, Lippke, & Nigg, 2016).

Focusing in primary care, we find several ways to promote physical activity including giving advice, providing written materials or referral to other programs for physical activity. Brief counselling combined with exercise prescription or advice from the primary healthcare providers seems to be more effective than long interventions in a gym, especially in inactive adults (Pavey et al., 2011). Many reasons can be found as to why primary care is well placed to promote physical activity. The high frequency of people that visit the services and the intrinsic part of health promotion already in primary care services are two of them. This applies especially to people with chronic diseases that benefit from this kind of promotion in a more continuous way (Williams, 2011).

In primary care, most of the interventions to promote physical activity are done by physicians and this promotion can and should be part of every consultation, especially in the cases of more sedentary people (Chakravarthy, Joyner, & Booth, 2002). Is it crucial to assess which patients can have a direct intervention and which ones need referral to a more specialized physical exercise intervention. There is also a need to follow up on the question of physical exercise in every consultation and have this important part of health promotion in mind more often (Blair & David, 2011) Even in regions with low socio-economical level either interventions focused on health education or supervised exercise seem to have a beneficial impact on these populations (Salvador et al., 2014).

Regarding the promotion in primary care by physicians, in the United States, a great percentage responded they asked general questions (76.4%) or even specific questions about the components of the patient's physical activity (70.5 %) (Smith et al., 2011). In Canada, 69.8% reported using verbal counselling and 15.8% only used

written prescriptions (Petrella, Lattanzio, & Overend, 2007). In the Catalan primary care, most of the doctors also reported to frequently promote physical activity (Ribera, Mckenna, & Riddoch, 2018). In Scotland, the results are similar as most practitioners (62%) reported they were likely to provide advice on physical activity to healthy adults (Douglas, Torrance, Teijlingen, Meloni, & Kerr, 2006). In Denmark, at least 90% of the doctors that responded to the survey promoted physical activity at least weekly. In the other page, 20% of them do not think it should be part of their job (Jorgensen, Nordentoft, & Krogh, 2012).

In order for clinical training to be present in the daily routine of healthcare professionals, more sports and physical activity related subjects need to be present in medical schools and in post-graduate education, for continuous learning during the professional career. A survey conducted to investigate the impact of physical activity related subjects in the medical curricula concludes that the formal education regarding this subject is not enough and does not provide enough training in order for the medical doctors to provide the best possible approach to their patients (Ward, 2015).

The level of education seems to influence how physical activity counselling is provided, as physicians who took more classes related to the subject are more prompt to counsel their patients. Another factor that is pointed to as an enabler is the amount of physical activity practised by the individual, as more active physicians are also more likely to recommend it to their patients (Joy, Blair, Mcbride, & Sallis, 2013).

Although there is plenty of information that there is a need to have more disciplines in healthcare connected to exercise as a medical tool and disease prevention, there are barriers in the integration of such services. Actions in the preventive medicine would require a more holistic approach by the healthcare professionals in the short term and more clinical training in the area of physical exercise (G. O. Matheson et al., 2011) More actions on programs that include patient centred education will also be important in the future, allowing individuals to be more empowered in the self-care process (Rossen et al., 2015).

It can be important for healthcare systems to think of exercise as medication that can be prescribed to patients, to increase this promotion in primary care. The fitness

industry needs to be taken into consideration as people are looking more and more for adequate fitness regimens (Sallis, 2009). Sports take a considerable amount of people into practising more physical activity, and need to be used as a network when having a person looking for advice, if they are apparently physically able to do so (Khan et al., 2012).

In the UK, the National Institute for Health and Care Excellence (NICE) has created guidelines and a guide to support brief advice for adults in primary care, in order to make it easier for health care professionals to identify inactive adults, provide advice on physical activity and follow up on this advice (NICE, 2018a). Still in the UK, there are also guidelines for exercise referral, where primary care providers can develop an agreement with the patient and try to see what would be the best action to take to increase physical activity in their lives (NICE, 2018b).

Walking and cycling should be promoted in primary care, as they are a source of energy expenditure that is easily accessible. For this type of promotion, there are also some guidelines to help primary care professionals take action (NICE, 2018c).

A couple of questions like "'on average, how many days/ week do you engage in moderate or greater physical activity (like a brisk walk)?" and "on those days, how many minutes do you engage in activity at this level?" can be a simple measure to understand the level of physical activity and check if patients meet the recommendations (R. Sallis, 2011). An intervention regarding physical activity referrals was effective in Sweden, as a large number of physically inactive people became more active and health professionals more aware of the opportunities of referral in their vicinity (Bendtsen, Nilsen, & Ekberg, 2008).

Behaviour change methods are important for physical activity promotion and the use of cognitive and behavioural strategies have been found to be effective in increasing the adoption of physical activity behaviours in different settings among primary care patients (Pinto et al., 2001). Social support and cognitive care were also attributed as factors that increase physical activity following counselling in primary care for sedentary overweight adults (Steptoe, Rink, & Kerry, 2000).

As most primary care patients are inactive, counselling without a proper strategy would result in a burden for healthcare services. Being able to select a target population based on motivational approaches, combination of risk factors and sociodemographic characteristics is useful to prioritise efforts (Grandes et al., 2008) The use of an approach called motivational interviewing - a counselling method that helps people going through change (Hettema, Steele, & Miller, 2005), showed to be a good predictor of change and an accessible tool that can be used as a primary-care based intervention supporting the development of behavioural change strategies for physical activity (Hardcastle, Blake, & Hagger, 2012).

The promotion either with 30 minutes of brief negotiation or direct advice face to face, followed by 6 additional contacts over 6 months showed improvement of the levels of physical activity (Hillsdon, 2000). The importance of proximity is crucial in order to sustain positive changes in behaviour towards physical activity. The use of digital tools such as text messages for this purpose has shown to be effective, especially in less active individuals (Cecilie & Duda, 2016).

The World Health Organization has an overview of the challenges to the provision of services on healthy diet, physical activity and weight management. These are: poor patient health literacy, beliefs and attitudes; lack of dedicated clinical guidelines for primary care; lack of a defined scope of practice; outdated knowledge, skills and competences; insufficient payment mechanisms for the services provided and insufficient information technology infrastructure and tools (WHO Regional Office for Europe, 2016). On the same document we also find some suggestions to integrate these services in primary care in the future: supporting patient self-management and peer support; including more evidence-based services; working on clinical guidelines and protocols for these services; updating the knowledge and competence of the primary care providers as well as their scope of practice; ensuring the availability of equipment and information technology and lastly aligning these services with other healthcare system functions (WHO Regional Office for Europe, 2016).

In Portugal, the Portuguese Institute for Sports and Youth (IPDJ) developed some programs regarding the promotion of physical activity. One of the is the "National Sports for All Program" that includes an approach on equity in the accessibility to

sports practice (IPDJ, 2018). Another example from the Institute of Mobility and Transports is the U-Bike project where students and staff at academic institutions can rent bicycles for a semester or a full academic year. This is a way to promote regular physical activity while considering the environmental aspects of transport (IMT I P - Instituto da Mobilidade e dos Transportes, 2017) Another grassroots association promoting physical activity is Coletivo Zebra, an association that promotes active breaks, walking meetings and even a walking bus for kids that serves as transport to school. (Coletivo Zebra, 2018).

Assessing physical activity as a vital sign is the aim of an initiative of the Portuguese Directorate-General of Health (DGS) and the Shared Services of the Ministry of Health (SPMS) that consisted on the development of a monitoring and surveillance system for physical activity. This tool, which was integrated into the "SClinico – Primary Health Care" software and serves for the primary health care system to assess the population's physical activity levels and sedentary behaviour and register it on electronic medical records. Currently the platform is available for medical doctors, nurses and registered dieticians and nutritionists, across the country (Ministério da Saúde, 2018).

The National Pharmacy Association (ANF) has also been developing some initiatives. One of them is the training of pharmacists in the area of physical activity and physical exercise in order to enable them to make a better counselling in relation to physical activity in their daily practice. This association is also a partner of Coletivo Zebra to involve pharmacies as promotors of walking groups (ANF, 2018).

Pharmacies can play an important role in initiatives for physical activity promotion in primary healthcare in the future due to their wide availability and resources, such as the availability of healthcare professionals, the provision of different health services and the integration with community-based partners. Besides these important factors, we can also highlight the proximity with the costumers and provision of self-care products, which helps to reduce the burden in other healthcare sectors and ultimately can contribute for the reduction in healthcare costs (Dalton & Byrne, 2017).

The promotion of physical activity in primary care is not a utopian quest, it can be reached through a network that include motivational interviewing, social support and multidisciplinary approaches. It is also important to have a synergic multisector action including healthcare professionals to develop this promotion in a sustainable way, and the pharmacies can be part of this action (Lion et al., 2018). How can pharmacists be more involved in the promotion of physical activity in the community pharmacies?

3.3. Pharmacies and pharmacists in the promotion of physical activity

Pharmacists are the third largest regulated healthcare professional group in the world, with most of the pharmacists representing community pharmacies. These have been identified as an easily accessible and cost-effective platform for delivering health care worldwide (FIP, 2006).

Community pharmacies offer a wide variety of services to the general public, from screening for hypertension, diabetes and dyslipidaemia to smoking cessation and sexual health. Although community pharmacists know they should be more involved in health promotion and disease prevention, they also understand that there is a significant difference between the ideal and the actual level of involvement (Laliberté, Perreault, Damestoy, & Lalonde, 2012). Despite the actual low involvement of pharmaceutical services in health promotion initiatives, these have shown good results. For example, in smoking cessation the interventions have shown to be effective and for weight management they seem to be feasible, justifying investment in these type of interventions (Brown et al., 2016). Helping with the weight management of pharmacy costumers started with a collaboration where nutritionists, in some countries as Portugal and Australia, deliver a specific nutrition consultation service to pharmacy costumers inside the pharmacy itself (Maher, Lowe, & Hughes, 2014).

Health promotion in the form of brief counselling, making an informed selection of the information the patient might need in order to be more active, is of most importance to allow pharmacists to be true healthcare professionals and not only retailers and dispensers of medicine (Mossialos et al., 2015). As of direct behaviours that pharmacists may display to promote more physical activity we find asking directly, in the form of brief advice, for physical activity when counselling and dispensing medicine either for long term conditions (as diabetes) or over the counter medicines relevant for the situation (as muscular injuries). Another important aspect is signposting local opportunities, such as walking groups or local initiatives for other activities (Public Health England, 2017). More examples of physical activity promotion we can find are evaluation of the performed physical

activity verbally or through the measurement of biometric parameters that relate to physical activity such as weight. In more specific cases, a sports nutrition consultation can also be conducted in the pharmacy (Salmon, Breman, Fotheringham, Ball, & Caroline, 2000).

Overall, costumers express a high level of satisfaction in the initiatives developed in community pharmacies. Using these initiatives to their full extent will allow an increase in the awareness in the general public and the role of the pharmacist in giving advice will be even more accepted and trustworthy (Bpharm, Bpharm, Armstrong, & Ma, 2004).

There is also a need to put pharmacists in the front row of public health services, by enhancing the training and skills of pharmacists and use the new technologies. This will allow the inclusion of the pharmacist as an empowered health professional able to act in a multidisciplinary way and in a perspective of health promotion through prevention (Agomo & Ogunleye, 2014).

Some barriers for the implementation of pharmacy based services related to public health have been identified, the main ones being time pressure and workload, insufficient funding, lack of skills and training, lack of patient records and lack of understanding by the general public on the role and skills of the pharmacists in order to deliver this kind of services (Agomo, Ogunleye, & Portlock, 2016) However, this study was not specific for physical activity promotion in community pharmacies, nor was it conducted in them. Hence, it becomes important to understand what the main barriers and facilitators regarding physical activity promotion by pharmacists are.

Models of behaviour change can support the identification of the main drivers and challenges faced by pharmacists in this regard. One integrative and comprehensive model of behaviour is the COM-B model that links three main components as sources of behaviour: Capability (defined as the individual's psychological and physical capacity to engage in the activity concerned, including having the necessary knowledge and skills), Opportunity (defined as all factors that lie outside the individual that make the behaviour possible or prompt it), and Motivation (defined as all brain processes that energize and direct behaviour, including habitual processes, emotional responding, as well as analytical decision-making). These categories are subdivided into 6 subcategories: Physical and psychological capability, social and physical opportunity and automatic and reflective motivation (Michie, Stralen, & West, 2011).

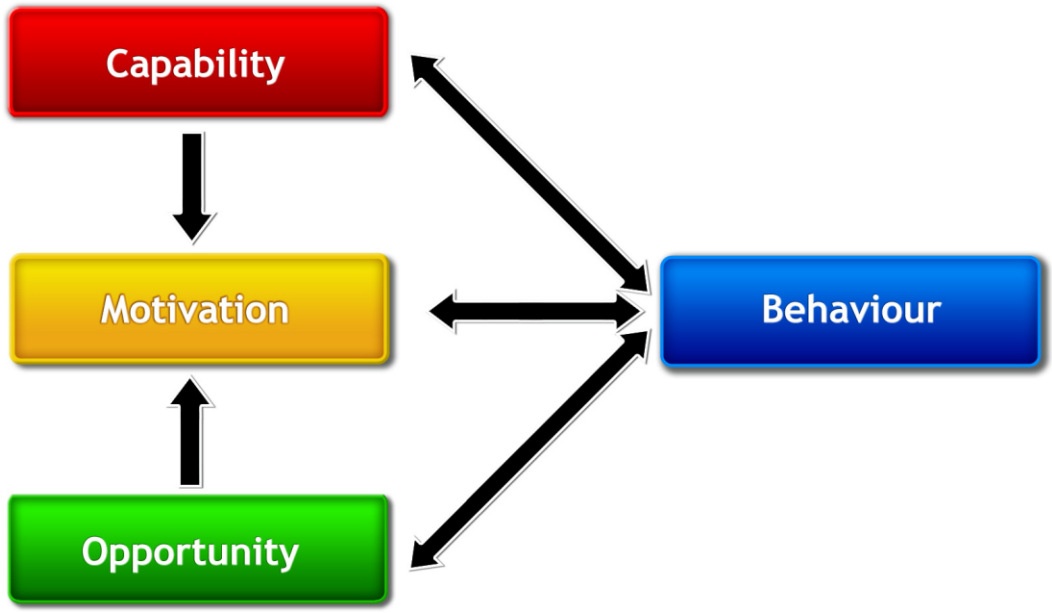

Figure 1 – COM-B model. Capacity, motivation and opportunity as main sources of behavior (Michie, Stralen, & West, 2011).

The main blocks of the COM-B model can be used in conjunction with the Theoretical Domains' Framework, providing more detail in terms of categorization of the domains that are associated with behavioural change (Atkins et al., 2017). In capability, physical capabilities correspond to physical skills and in the psychological capabilities we can list knowledge, cognitive and interpersonal skills, memory attention and decision processes and behaviour regulation. In terms of opportunity, social influences take part in the social subdivision and environmental context and resources in the physical subdivision.

Motivation has the most domains, those being reinforcement and emotion linked to the automatic motivation and social/professional role and identity, beliefs about capacities, optimism, intentions, goals and beliefs about consequences connected to the reflective motivation. (Atkins et al., 2017).

Figure 2 – Sources of behaviour and the Theoretical Domains Framework domains regarding behavioral change (Atkins et al., 2017)

The main goal of the present thesis is, therefore, to understand the main barriers and facilitators of physical activity in the Portuguese community pharmacies, based on COM-B model and the Theoretical Domains Framework, and to characterize the pharmacist's knowledge, behaviours and attitudes regarding this promotion.

Methods

Participants

A convenience sample of 467 community pharmacists (approximately 5% of the total number of pharmacists in Portugal) (ANF, 2017) have participated in this study, through the Centre for Studies and Evaluations in Health (CEFAR) from the National Pharmacies Association (ANF) that shared a link with the pharmacies.

According to a study from the Portuguese Pharmaceutical Society (Ordem dos Farmacêuticos, 2018) there are more than 2900 pharmacies in Portugal with average 3 pharmacists per pharmacy. This study also found that 79% of the population is female and 21% is male. According to the age range, 41% are less than 35 years old and 68% less than 45 years old.

Instruments

A survey was used to assess and characterise physical activity promotion in the Portuguese community pharmacies.

The questionnaire followed a similar structure to a previous survey directed at the medical doctor's community and included four blocks: (1) Professional and sociodemographic characterization; (2) Characterization of the actions of physical activity promotion; (3) Characterization of the pharmacist's physical activity levels and (4) Facilitators and barriers for physical activity promotion. The survey (Appendix 1) had a total of 22 questions and was distributed online through the QUALTRICS® platform, in order to be accessible to all pharmacists in the country.

The block on the barriers and facilitators for physical activity promotion was developed by applying the COM-B model (Michie, Stralen, & West, 2011) and the domains of theTheoretical Domains Framework (Atkins et al., 2017) to the Portuguese context of community pharmacies and physical activity promotion (see Table 1).

Table 1 – Design of the survey, according to the COM-B and TDF models.

	Components of the COM-B model [102]	Components of the TDF model [103]	Questions
Barriers and facilitators of physical activity promotion	Capacity	Knowledge	**14. Which level of knowledge you consider you have regarding physical activity?** **15. According to the recommendation on physical activity practice in the general population, it seems adequate:** 17. b) Lack of technical knowledge in this area 17. i) Not knowing opportunities for referral in the community (ex. Community physical activity programs / spaces where physical activity can be done) **19. Did you ever had formation on physical activity / physical exercise?**
		Cognitive and interpersonal capabilities	17. k) Not knowing exactly what to say/ask to counsel on physical activity
		Memory, attention and decision process	17. g) Low relevance during counseling
		Behavioural regulation	17. l) Forgetfulness (to talk about physical activity with the costumers)
	Oportunity	Context and resources	17. a) Lack of time to promote physical activity

			17. e) Lack of coordination with other healthcare professionals **17.** f) Lack of a specific place for this promotion
		Social influences	**16. How often are you approached whit questions about physical activity?** **17.** d) Lack of immediate interest from the costumers **17.** h) Not being usual this type of counseling
	Motivation	Reinforcement	**17.** n) There are no incentives for physical activity promotion in the pharmacies
		Identity and social/professional role	**17.** j) Physical activity is not part of the role of the pharmacist
		Beliefs about capacities	
		Beliefs consequences	12. **Which importance do you attribute to the practice of physical activity in the population's health?** **13. Which importance do you attribute to the promotion of physical activity in the pharmacies?** **17.** c) Afraid of health risks 17. m) The clients from this pharmacy have so many other problems that doing more physical activity is not a priority
		Objectives	17. o) I don't have great interest in physical activity promotion

Procedure

The study was performed in collaboration with the Centre for Studies and Evaluations in Health (CEFAR) from the National Pharmacies Association (ANF). The study protocol was reviewed by the Ethical Commission of the Faculty of Human Kinetics and was approved with the number 18/2018. The respective document can be found in Appendix 2.

The survey was sent via email to the directors of community pharmacies asking them to share it with the certified pharmacists working in their pharmacies. Out of the 2922 community pharmacies existent in Portugal, 2745 received the e-mail with the link to the questionnaire, which represents 94% of national coverage. The responses were collected from the 29th of November 2018 to the 20th of December 2018.

Participants were informed about the study objectives and asked to provide their informed consent prior to filling in the online survey. The survey took approximately 10 to 15 minutes to complete. A thank you note for the participants was added at the end of the survey.

Statistical Methods

Descriptive statistics (e.g., absolute and relative frequencies, means, standard deviations, correlations) were used to quantify and characterize the different aspects of physical activity promotion.

For the categorical variables the qui-square test was used. For the numerical variables linear regressions were performed (F-test). All tests were performed bilaterally with a significance level of $\alpha = 0.5$

The statistical analyses were performed using the SPSS® software.

Results

The survey had 537 opens in total, from which 467 (87.0%) were partially completed and 396 (73.7%) fully completed. There was no significant difference between the dropout rate in relation to both gender (p = 0.5) and age (p = 0.5).

The first set of questions registered 467 responses. In the first question that characterized gender, 86 respondents were men (18.4%) and 381 were women (81.6%).

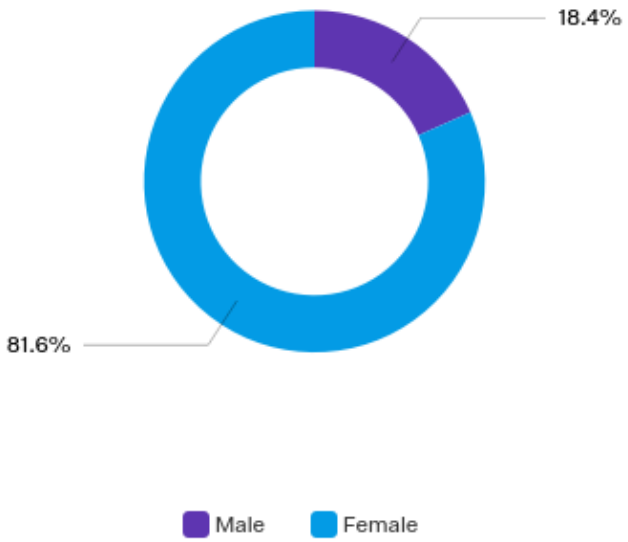

Figure 3 – Distribution of responses by gender.

Regarding the age of the respondents, the average was 40.0 (SD = 10.0) years. (Min = 23; Max = 76). 36.6% were 35 years old or less and 71.3% were younger than 45 years old.

The pharmacists had in average 14.3 (SD= 9.0) years of experience (Min= 0; Max = 51). Regarding the training on physical activity or physical exercise, out of 405 responses, 49 (12.1%) had pre graduated training, 14 (3.4%) had post graduated training and 342 (84.5%) did not have any training on these topics.

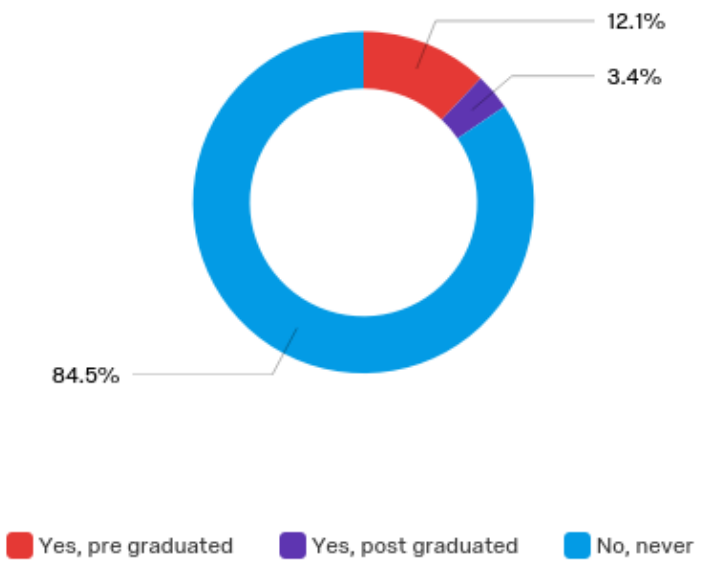

Figure 4 – Training in physical activity

The global distribution in the country according to the responses in the different working regions is presented on Table 2.

Table 2 – Distribution of responses by district

District	*N*	% of the total of responses	Approx. Number of pharmacists	% inside the district
Aveiro	41	8.78	534	7.68
Beja	8	1.71	159	5.03
Braga	28	6.0	537	5.21
Bragança	7	1.5	123	5.69
Castelo Branco	18	3.85	186	9.68
Coimbra	21	4.5	435	4.83
Évora	8	1.71	183	4.37
Faro	26	5.75	339	7.67
Guarda	4	0.86	165	2.42
Leiria	30	6.45	384	7.81
Lisboa	100	21.4	1839	5.44
Portalegre	4	0.86	135	2.96
Porto	70	15.0	1161	6.03
Santarém	22	4.71	405	5.43
Setúbal	37	7.92	594	6.23
Viana do Castelo	5	1.07	198	2.53
Vila Real	17	3.64	198	8.59
Viseu	10	2.14	312	3.21
Açores	2	0.43	162	1.23
Madeira	9	1.93	186	4.84
Total	467	100	8037	Average coverage = 5.81

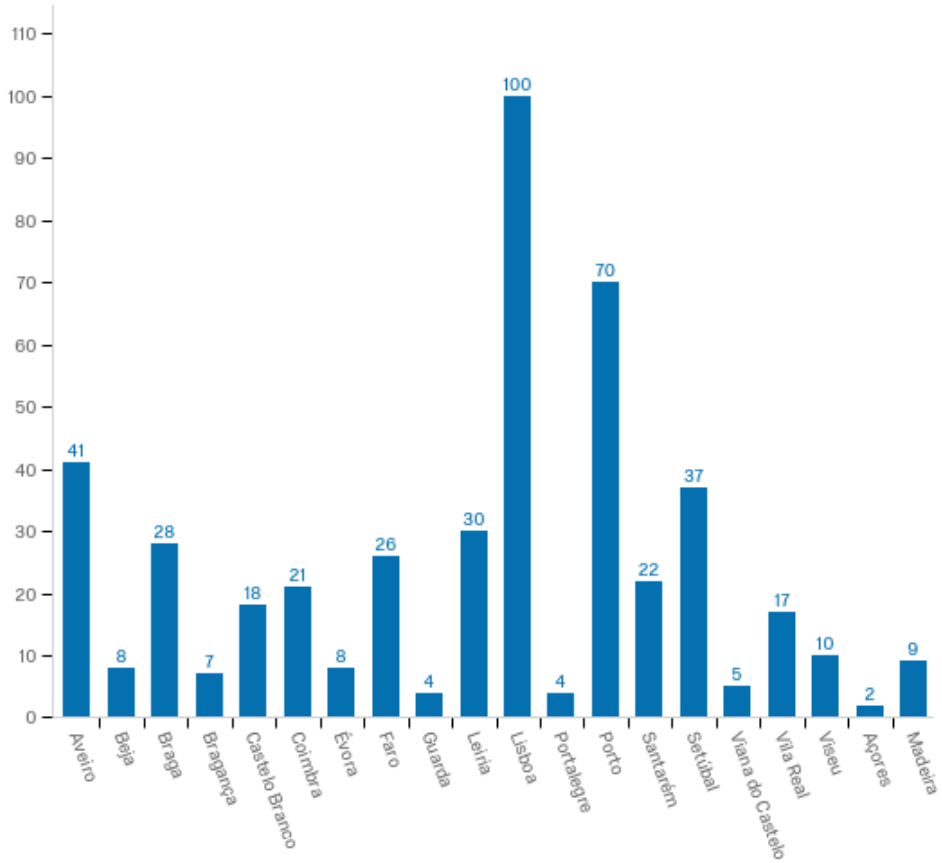

Figure 5 – Distribution of responses by district.

A total of 386 valid answers were obtained that allowed to characterize the physical activity practiced by pharmacists. When asked how many days per week did they enrolled in a fast walk or physical activity of equivalent intensity, the average was 2.1 (*SD* = 1.7) days. The average duration of those activities was of 0.9 (*SD*= 0.9) hours during the day, counting only the moving periods.

Calculating the minutes per week (days per week * amount of hours per day * 60) the average pharmacist performs 113.4 (*SD* = 96.1) minutes of moderate exercise per week. The median for this same performance per week is 120 minutes. The number of pharmacists who reported to complete more than 150 minutes per week of moderate activity was 150, which represents 38.7% of the sample.

Regarding the number of sitting hours during the day, the answers were, on average, 3.57 (*SD*= 2.25) hours per day.

Regarding the location of the pharmacy and average age profile of their costumers, 187 (40.0%) were based in a rural place, 223 (47.8%) were in a neighborhood and 57 (12.2%) pharmacies were established in commercial places.

Inside the ones located in a rural location none had mostly young people, 76 (16.3%) mostly aged people and 111 (23.4%) a mixed profile. Inside the ones located in a neighborhood, 69 (14.8%) reported mostly aged people, 3 (0.6%) young people and 151 (32.3%) a mixed profile.

From the pharmacies established in commercial places, none had mostly young people, 6 (1.3%) had mostly aged people and 51 (10.9%) a mixed profile.

These results are presented below (table 3):

Table 3 – Distribution of responses by location of the pharmacy and profile of costumers

Location of the pharmacy	Profile of costumers
Rural place – 187 (40.0%)	Aged people – 76 (16.3%)
	Mixed profile – 111 (23.4%)
	Young people – 0 (0%)
Neighborhood – 223 (47.8%)	Aged people – 69 (14.8%)
	Mixed profile – 151 (32.3%)
	Young people – 3 (0.6%)
Commercial place – 57 (12.2%)	Aged people - 6 (1.3%)
	Mixed profile – 51 (10.9%)
	Young people – 0 (0%)
Do not know/Does not respond	0 (0%)
Total – 467 (100%)	

From all the pharmacists who answered the questionnaire, only 464 replied to question number 6 (i.e., "*Do you promote physical activity in your professional routine*?"). From these, 366 (78.9%) reported that they promote physical activity in their daily routine. The 98 (21.1%) that replied "no" did not reply to the following 5 questions on physical activity promotion initiatives.

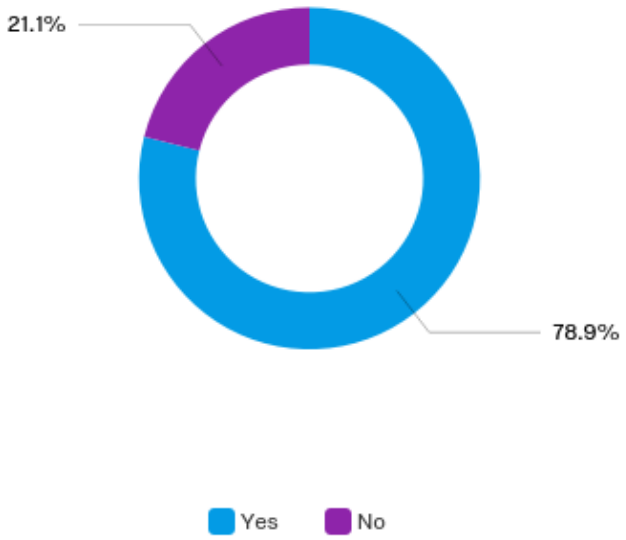

Figure 6 – Percentage of pharmacists that promote physical activity in their daily routines.

From those who said to promote physical activity, no one mentioned doing it in every consultation with the patient, 43 (11.7%) referred doing it in most consultations, 97 (26.5%) in approximately half of them, 214 (58.5%) in only a few and 1 (0.3%) in none. There were 11 missing responses to this question (3%).

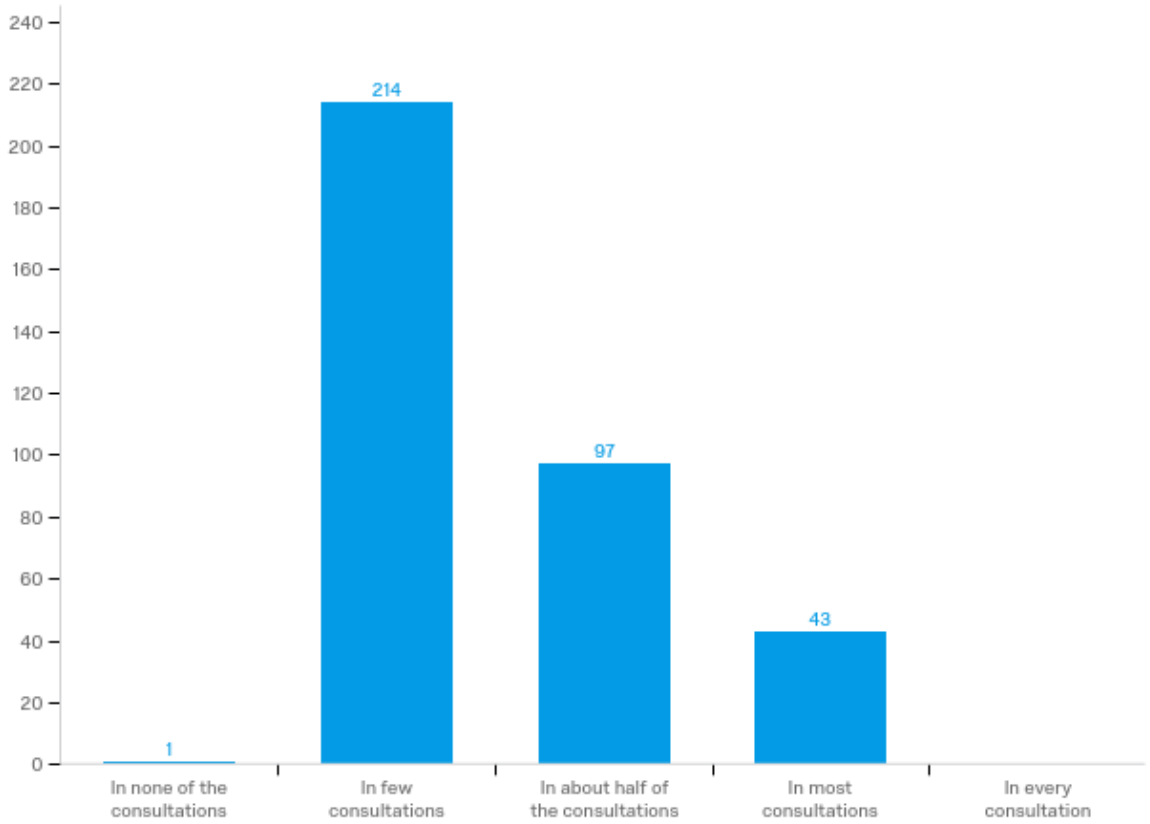

Figure 7 – Frequency of promotion in the pharmacist's daily routine

Regarding the areas of promotion, 178 (48.6% of the sample) responded they promoted mostly the interruption of sedentary behaviors, 109 (29.8% of the sample) active transportation and 273 (74.6% of the sample) physical exercise / sports. Still, 1, (0.3%) mentioned none of the above. Regarding the combinations of answers, 65 (17.8%) signalled both interrupting sedentary behaviors and promoting active transportation, 118 (32.2%) interrupting sedentary behaviours and physical exercise/sports and 66 (18.0%) chose active transportation and physical exercise/sports. Additionally, 44 (12.0%) chose all the three options. The different combinations are presented in table 4.

Table 4 – Areas of promotion of physical activity

Types of physical activity promotion	*N*	% of total
Breaking sedentary behaviors	178	48.6
Active transportation	109	29.8
Physical exercise/sports	273	74.6
None of the above	1	0.3
Breaking sedentary behaviors + Active transportation	65	17.8
Breaking sedentary behaviors + Physical exercise/sports	118	32.2
Active transportation + Physical exercise/sports	66	18.0
Breaking sedentary behaviors + Active transportation + Physical exercise/sports	44	12.0
Total	366	

In the specific activities reported regarding physical activity promotion, 43 (11.7%) said they assessed the level of physical activity performed by their clients, 72 (19.7%) reported to give written information, 325 (88.8%) verbal information, 86 (23.5%) referred selling supplements for sports, 92 (25.1%) measured the biometric parameters, 98 (26.8%) promoted activities in the community, 83 (22.7%) referred to other activities, such as walking groups and 61 (16.7%) indicated sports nutrition consultations.

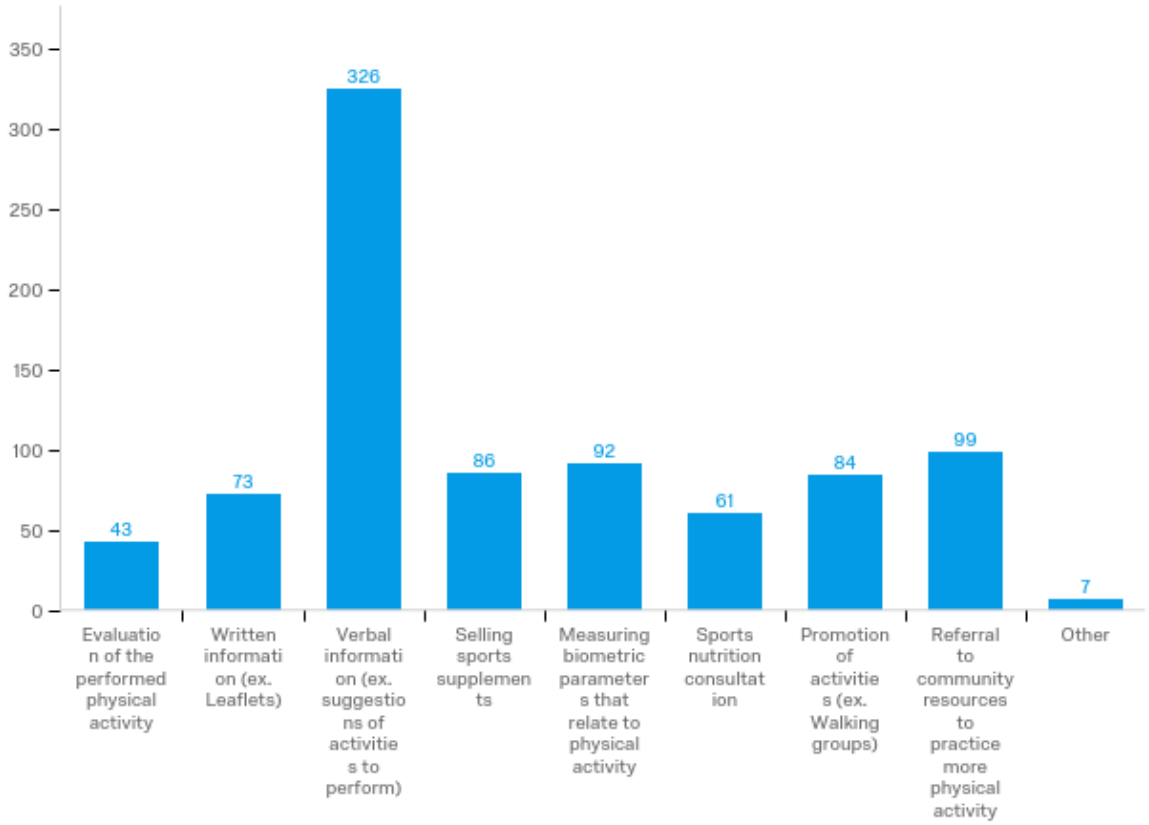

Figure 8 – Types of promotion done in the pharmacies

Seven (1.6%) pharmacists also mentioned other activities, including doing a nutritional consultation in the pharmacy, nutrition workshops in schools, referral to hydro gymnastics and classical Pilates and informative posts /challenges in the Facebook page of the pharmacy.

From the 98 pharmacists that referred their costumers to community physical activity resources for practice, 66 (67.4%) mentioned they referred their costumers to gyms, 50 (51.0%) to activities promoted by the local communities, 57 (58.2%) to walking groups, 16 (16.3%) to activities promoted by schools, 31 (31.6%) to activities promoted by senior universities or daycare centers for seniors and 23 (23.5%) to activities promoted by the pharmacy itself. A total of 8 (8.2%) participants replied "Other", and their responses included local swimming pools, Pilates studios, walking as a daily routine and joining / gathering with someone that usually walks.

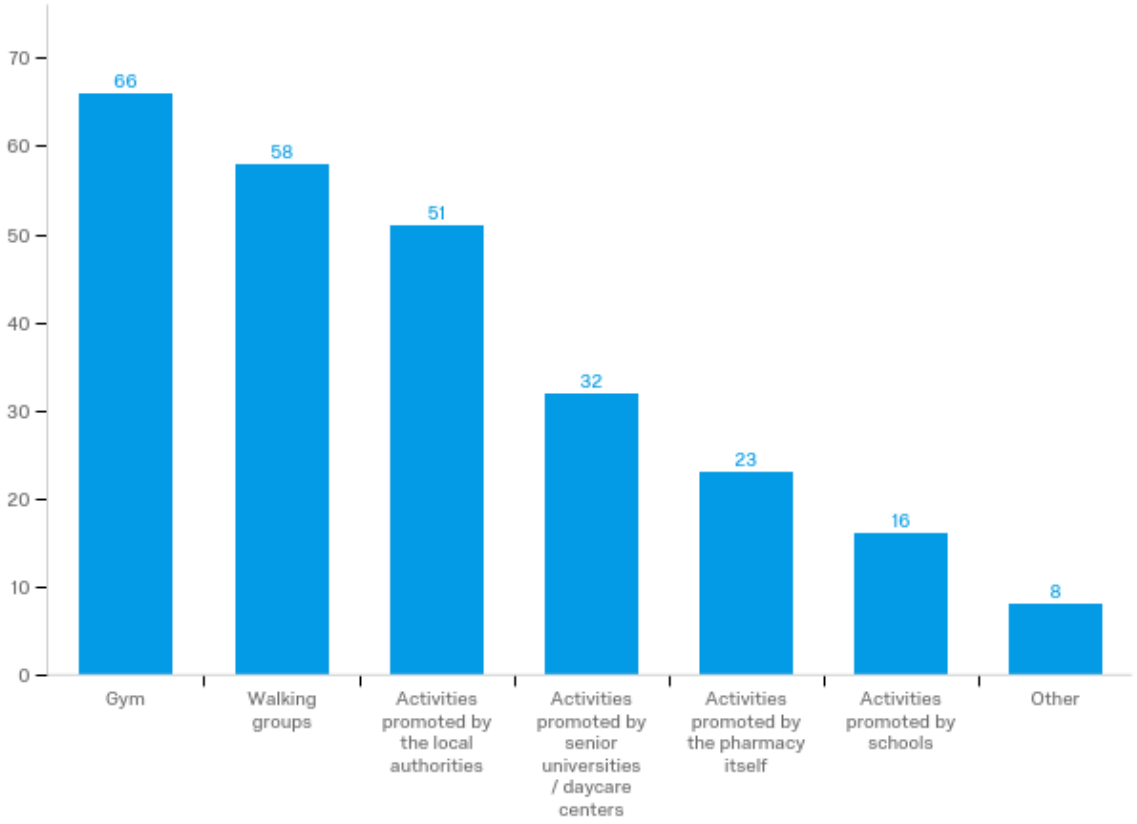

Figure 9 – Resources used in the community.

Regarding the specific activities promoted, 350 (95.6%) promoted walking, 29 (7.9%) running, 221 (60.4%) swimming/hydro gymnastics, 63 (17.2%) gym activities, 13 (3.6%) specific modalities, such as football, martial arts, etc, 33 (9%) gymnastics, 44 (12%) dance and 101 (27.9%) yoga/pilates/stretching. 6 (1.6%) Other responses included walking instead of permanent driving and body balance.

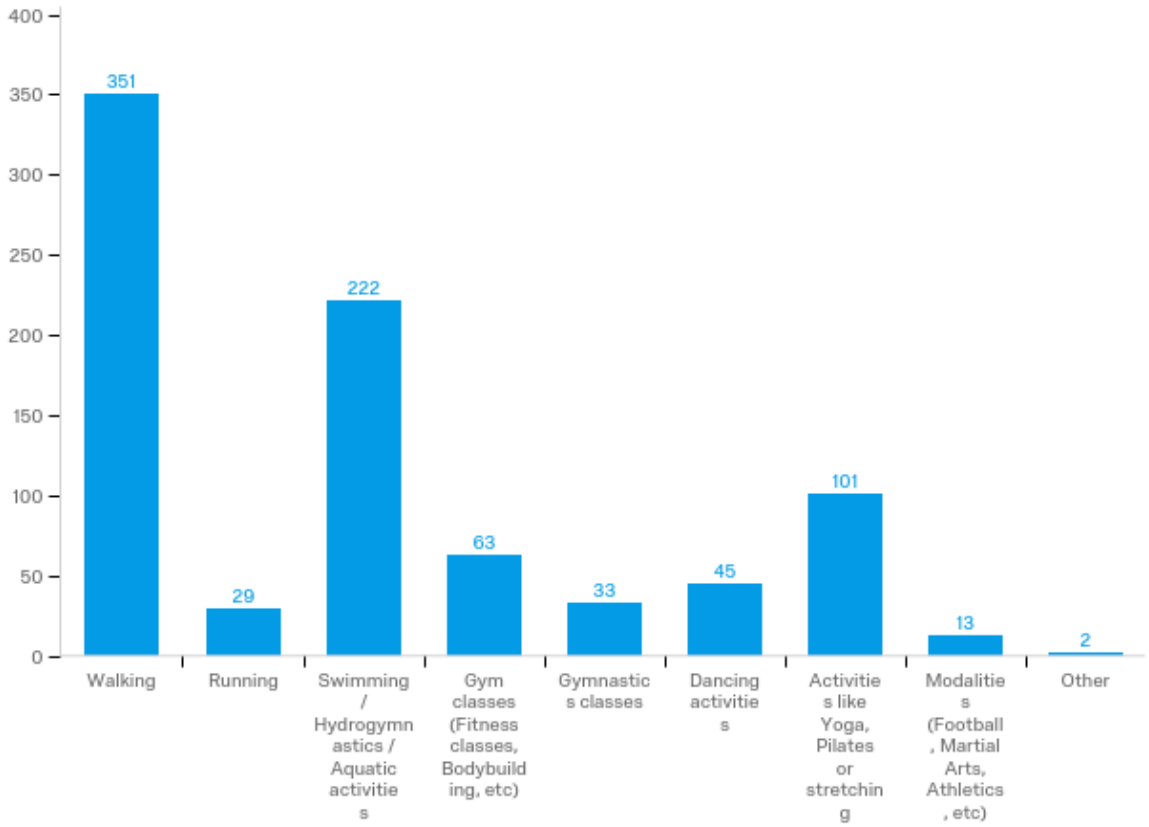

Figure 10 – Types of physical activities promoted by the pharmacists.

The first question on the barriers and facilitators for physical activity promotion asked how important physical activity was for the health of the population. From the 427 respondents, none mentioned not being important at all, 3 (0.7%) of low importance, 2 (0.5%) neither important nor unimportant, 86 (20.1%) important, 337 (78.7%) very important.

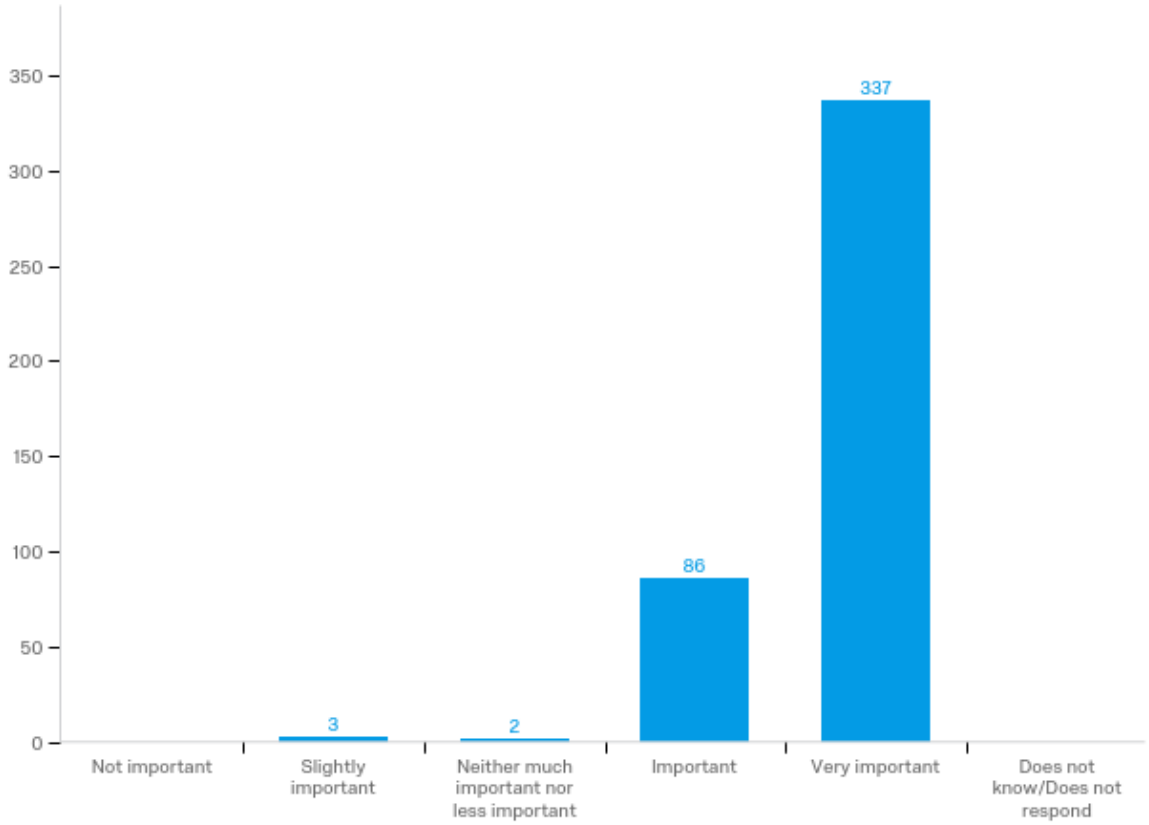

Figure 11 – Perceived importance of physical activity promotion for health

Regarding the importance of promoting physical activity in the pharmacies, none of the pharmacists mentioned not being important at all, 3 (0.7%) considered it of low importance, 18 (4.3%) referred that it was neither important nor unimportant, 185 (43.3%) important, 221 (51.5%) very important and 1 (0.2%) did not know /did not respond.

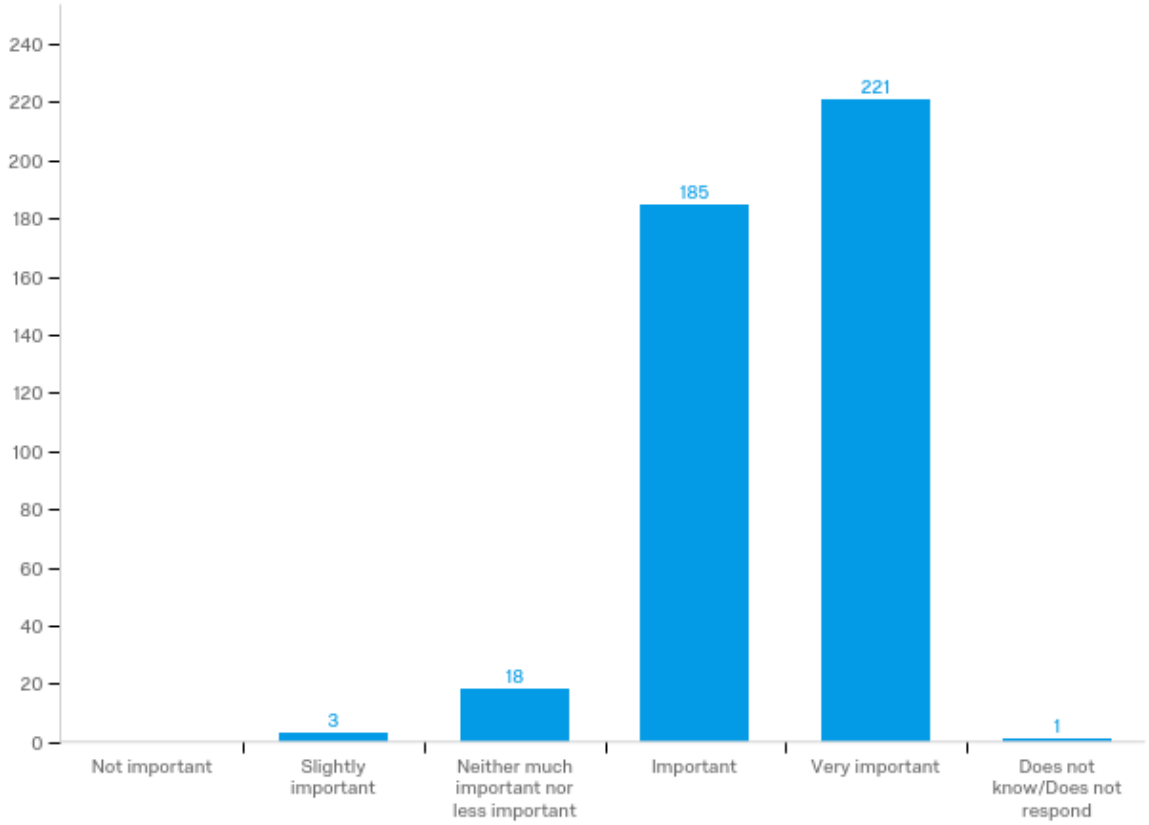

Figure 12 – Perceived importance of physical activity promotion in the pharmacies

The degree of self-rated knowledge on physical activity was evaluated as very high by 15 (3.5%) respondents, high by 88 (20.6%), average by 274 (64.1%), low by 44 (10.3%), and very low by 6 (1.41%).

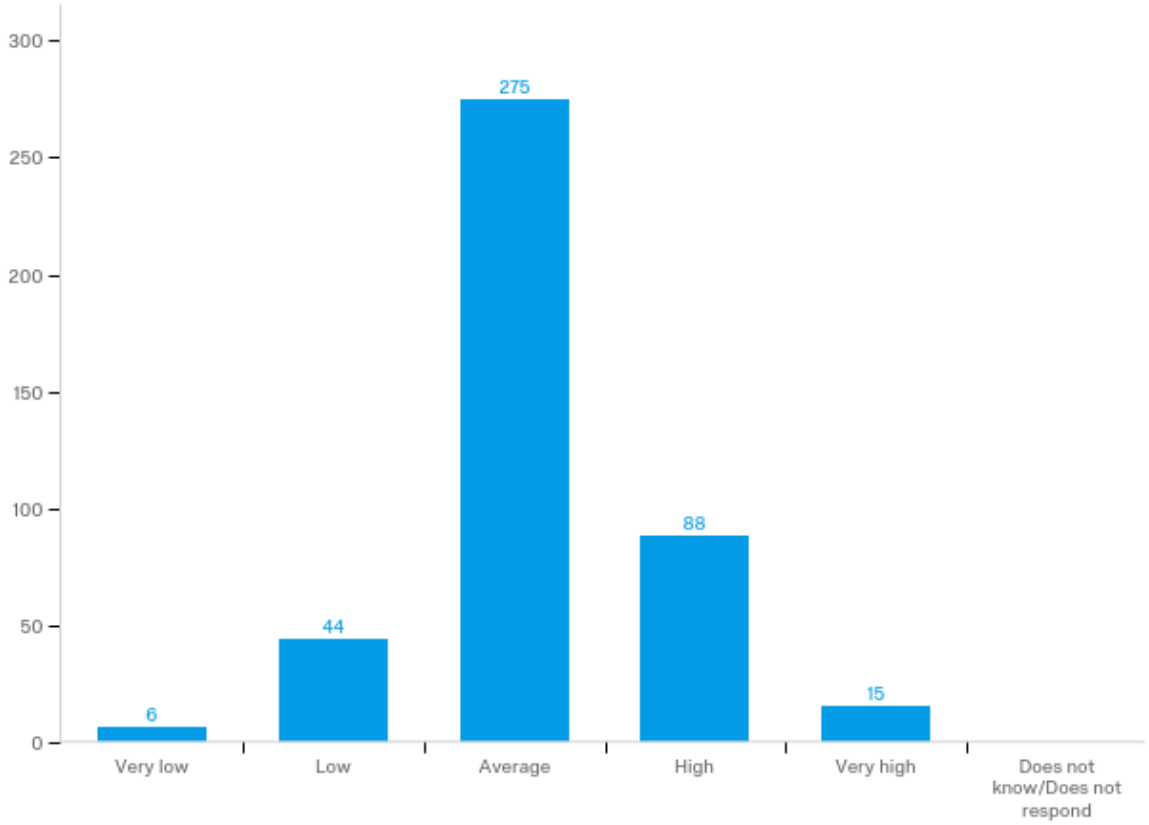

Figure 13 – Self-rated level of knowledge regarding physical activity

Regarding the question *"What are the recommendations for the amount of weekly moderate intensity physical activity for the general population?"*, 45 (10.5%) respondents said 60 minutes, 133 (31.2%) said 90 minutes, 176 (41.2%) said 150 minutes and 61 (14.3%) 200 minutes. 12 (2.8%) did not know or did not respond.

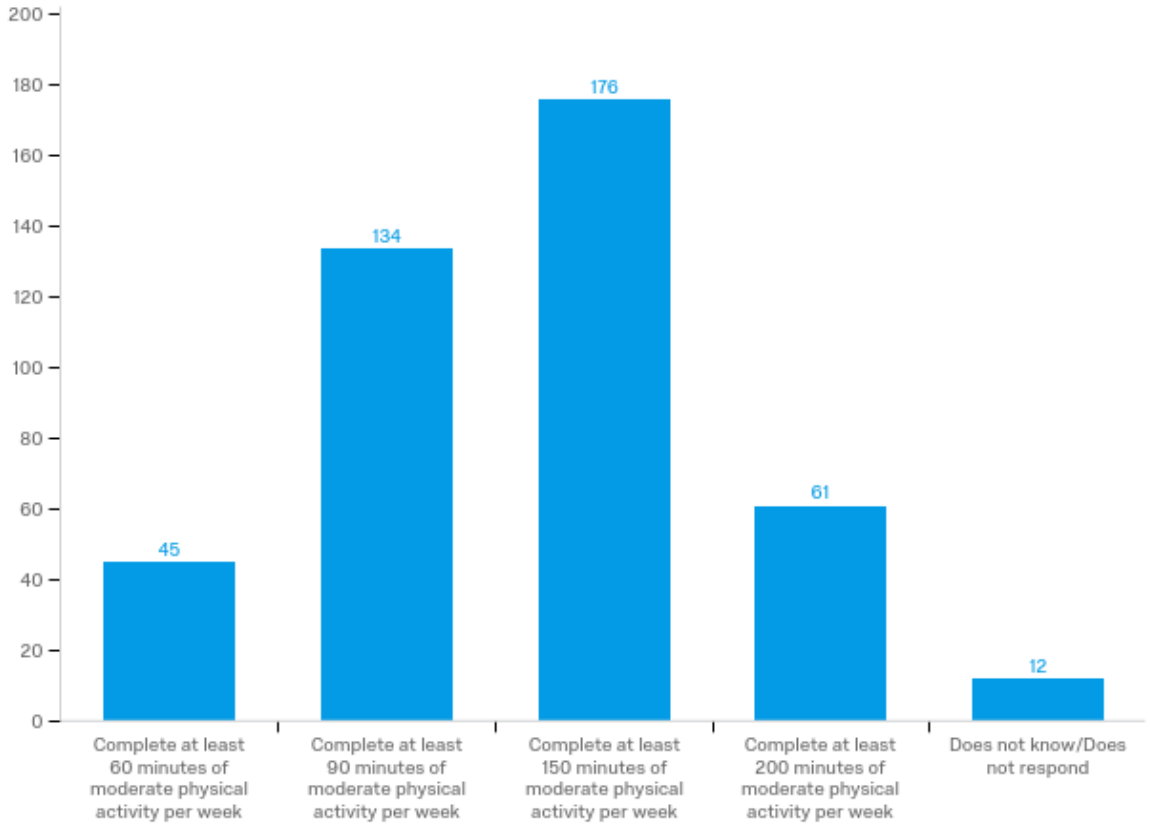

Figure 14 – Minutes per week of moderate intensity physical activity indicates as being the recommended for the population

When asked what the frequency of costumers approaching them with questions regarding physical activity in the pharmacy was, 8 (1.9%) mentioned being asked every day, 81 (19.0%) at least once per week, 94 (22.0%) at least once per month, 221 (51.8%) rarely and 23 (5.4%) never.

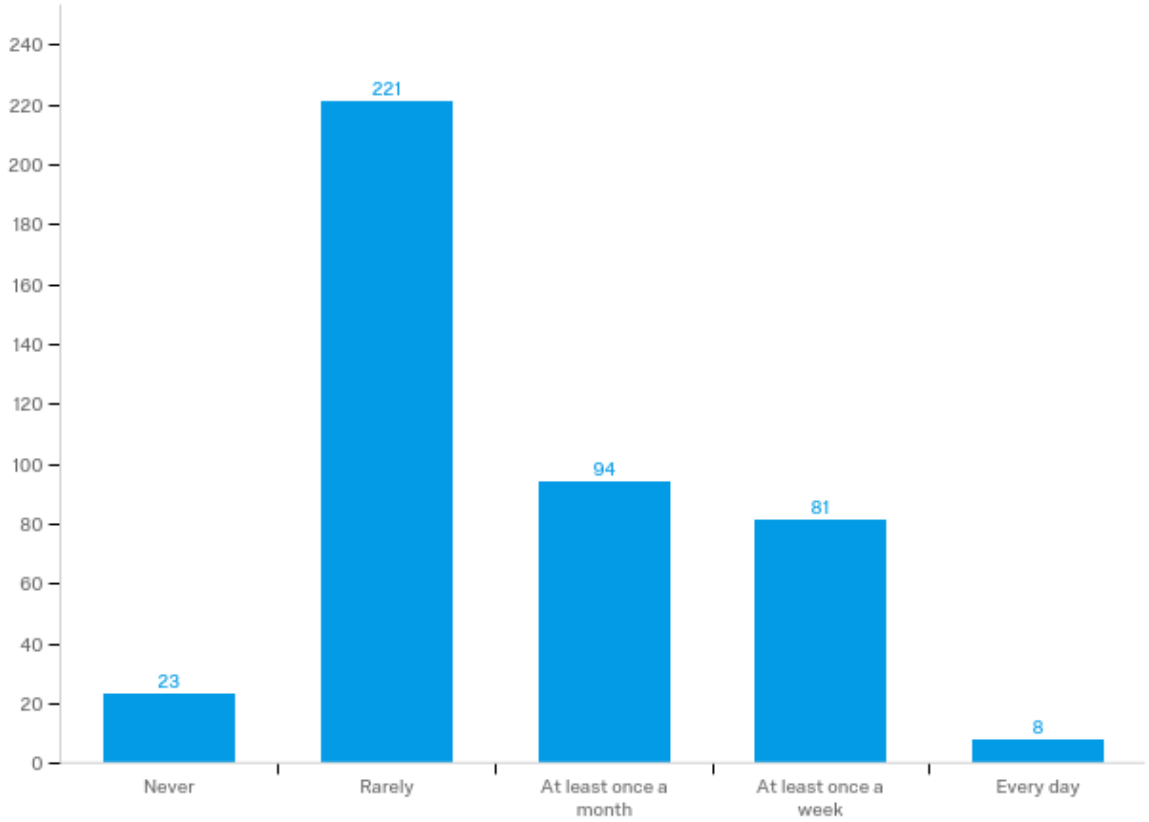

Figure 15 – Frequency of clients approaching with questions regarding physical activity.

A question regarding the facilitators and barriers that prevented or facilitated physical activity promotion in the pharmacies asked respondents to rate a set of items on a scale ranging from 1 (not likely to be a barrier) to 5 (most likely to be a barrier). The possible barriers were classified as it follows: Lack of technical knowledge in the area 2.82 (*SD*=1.05); Afraid of the health risks 2.75 (*SD*=1.04); Lack of immediate interest of costumers 3.25 (*SD*=1.09); Lack of coordination with other health professionals 3.35 (*SD*=1.11); Lack of a proper space for this promotion 2.86 (*SD*=1.24); Lack of relevance during the counselling 2.80 (*SD*=0.95); this kind of counselling not being usual 2.66 (*SD*=1.05); Not knowing opportunities of referral in the community 2.98

(*SD*=1.10); Promotion of physical activity is not part of the role of the pharmacist 1.82 (*SD*=1.04); Not knowing exactly what to do/what to say counseling about physical activity 2.46 (*SD*=1.10); Forgetting 2.78 (*SD*=1.11); The costumers of this pharmacy have so many other problems that practicing more physical activity does not represent a priority 2.31 (*SD*=1.01); There are no incentives for the promotion of physical activity in the pharmacies 2.66 (*SD*=1.17); I don't have great interest in the promotion of physical activity 1.58 (*SD*=0.83).

"Other" responses (n=8) included: Create teams for this kind of intervention; collaboration with other entities, such as municipalities; Most clients are not receptive to change any habit that involves the minimum effort. It is quite demotivating to hear repeatedly the "Yes, but.."; There are no physical education classes and Clients with a lot of pain and are not able to practice any kind of physical exercise. A summary of the responses can be found on table 5.

Table 5 –Barriers to the promotion of physical activity in the pharmacies

Category	N	Value (mean)	Standard deviation (*SD*)
Lack of time to promote physical activity	405	3.06	1.03
Lack of technical knowledge in the area	405	2.82	1.05
Afraid of the health risks	403	2.75	1.04
Lack of immediate interest of costumers	404	3.25	1.09
Lack of coordination with other health professionals	405	3.35	1.11
Lack of a proper space for this promotion	405	2.86	1.24
Lack of relevance during the counselling	403	2.80	0.95

Not usual this kind of counselling	405	2.66	1.05
Not knowing opportunities of referral in the community	404	2.98	1.10
Promotion of physical activity is not part of the role of the pharmacist	402	1.82	1.04
Not knowing exactly what to do/what to say counseling about physical activity	401	2.46	1.10
Forgetting	403	2.78	1.11
The costumers of this pharmacy have so many other problems that practicing more physical activity does not represent a priority	404	2.31	1.01
There are no incentives for the promotion of physical activity in the pharmacies	405	2.66	1.17
I don't have great interest in the promotion of physical activity	401	1.58	0.83

When asked about the importance of specialized professionals in the area of physical activity in the pharmacies, out of 405, 2 (0.5%) of the pharmacists mentioned not being important at all, 33 (8.2%) considered it of low importance, 64 (15.8%) neither important nor unimportant, 201 (49.6%) important, 97 (24.0%) very important and 8 (2.0%) did not know or did not respond.

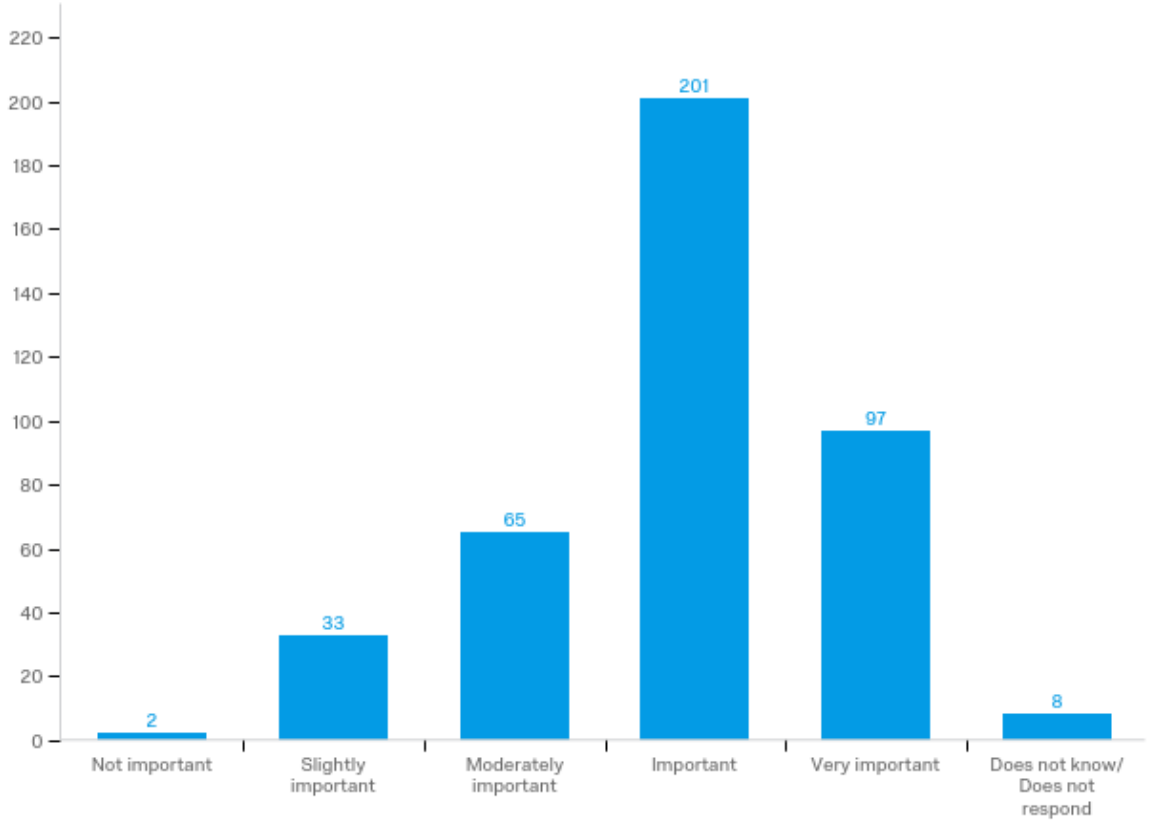

Figure 16 – Importance of specialized professionals in the area of physical activity in the pharmacies

Discussion

The promotion of physical activity remains a critical factor for population's health and well-being. Pharmacies and pharmacists can play a very important role in the promotion of physical activity. This research sought to understand the factors that influence the present and future promotion of physical activity in the context of Portuguese community pharmacies.

When compared to the pharmacist's population, the sample had a similar gender and age distribution. The percentage of pharmacists that mention promoting physical activity is quite high (almost 80%), although the frequency of this promotion is reduced, as most pharmacists (around 60%) only do it in a few of their interactions with their clients. This might be linked to the low level of interest by costumers and to the fact that the setting of the pharmacy is not currently seen as a place where physical activity can be discussed, as pointed in previous research (Kaae, Traulsen, & Nørgaard, 2014). Hence, in order to transform the pharmacy setting into a place where physical activity is consistently promoted, a change in the mindset of costumers but also of the pharmacy staff are needed (Björkman, Viberg, Rydberg, & Lundborg, 2008).

Regarding the types of physical activity, the most frequently cited is physical exercise and sports, as it may be the most well-known way of activity. Less than half of the pharmaceutics who replied to the questionnaire mentioned promoting the interruption of sedentary behaviors and active transportation; hence, raising awareness of pharmaceutics that these alternative types of physical activity may be an important goal in order to increase the levels of physical activity in the general population through pharmacies.

The most frequently referred means of promoting physical activity in the pharmacy was verbal counselling. This may be the case as it is the one having a better fit with the current practice of pharmacists, which relies in consecutive short consultations with the costumer, with a limited time for each. Thus, more focus could be put into having printed information as it is a way of people taking home the correct information on activities they can do, which can be particularly important for older people and/or

with multiple conditions, which are the predominant groups of clients in most pharmacies.

The promotion of walking was reported by 19 out of 20 pharmacists. This can indicate that the easy accessibility of walking is an important tool for the pharmacists. The inclusion of walking groups, that some pharmacies already have (some of which have the pharmacy as the meeting point for the group), could be a very important contribution for the increase of the community's physical activity levels (Hanson & Jones, 2015). There are anecdotal reports that this is a strategy now followed by several primary care health centers (Unidades de Saúde Familiar) in Portugal and also elsewhere (https://walkwithadoc.org).

Although the pharmacy has health professionals capable of interpreting parameters related to physical activity, we are missing more action in the measurement of biometric parameters, evaluation of the physical activity, and dynamization of activities, such as walking groups. One other aspect that can also be improved is the referral to the community structures that can help supporting the development of more active people. The main referral points indicated by pharmacists were gyms and walking groups, but some pharmacies are also being proactive in creating support for their clients, what can be seen as a good signal.

Almost all pharmacists (98%) agreed that physical activity promotion is important or very important for the health of the population. Also, almost all pharmacists (95%) find it very important to promote physical activity in the pharmacies. This is a strong indicator that pharmacists are motivated to promote physical activity, which is consistent with results of other studies showing they are keen on expanding the scope of services they offer (C. Matheson & Bond, 1999).

An investment in the capacitation of the pharmacists to promote physical activity could therefore be considered in this regard, particularly when considering that almost 85% never had training in the area, and only around 25% evaluated their knowledge on physical activity as high or very high. Accordingly, only 40% of the pharmacists who answered to the questionnaire chose the right answer regarding the WHO recommendations. These results highlight the importance to invest in both pre and

post graduated training. The pre-graduate education needs to be planned together with the national student associations and the universities, so more time can be allocated to this topic in the universities. As other studies revealed, there is a need to increase these subject's relevance in the curricula and students are aware of the need to acquire skills on the topic (Dirks-naylor, Griffiths, & Bush, 2019). The post-graduate initiatives lie on the efforts of ANF and other professional organizations to keep the pharmacists up to date in terms of their role in physical activity promotion.

Interpreting the results on the barriers and facilitators for physical activity promotion, in the light of the COM-B model (Michie et al., 2011), there seems to be an insufficient level of capacity, despite the generally high levels of motivation regarding physical activity promotion. On the other hand, opportunity is the less favorable factor. While improvements in the areas of capacity and motivation seem to require less intervention, there is a great need to focus on opportunities. This encompasses social influences, as well as contextual factors and physical resources. This means that there needs to be a change towards setting the pharmacy as a place where capacitated pharmacists with correct information and resources to fulfill the different needs of their costumers regarding physical activity.

Regarding the inclusion of a specialized professional in the area as a differentiated service, most pharmacists (70%) also agree that this could be important. This could lie on the fact that pharmacists have limited knowledge and resources, such as time, to provide a more extensive consultation that includes measuring biometric parameters and prescribing a specific plan for everyone. Exercise physiologists are the best-suited allied health professionals for this task.

While looking at the evidence that more active health professionals promote more physical activity (Lobelo & Quevedo, 2016) we can look at the levels of physical activity reported by the pharmacists. Both the mean time (113 minutes per week) and the median time of moderate physical activity for the pharmacists (120 minutes per week) suggests that the general group of pharmacists is not sufficiently active.
Physical activity is also inherent to the professional activity of the pharmacists, as they normally work standing and walking around, and this is reflected in the time they spend sitting on each day (i.e., less than 4 hours, on average). This value is below the cut-

off time where sedentary behavior represents a health risk (Katzmarzyk, Church, Craig, & Bouchard, 2004).

One of the main limitations of this study is that a convenience sample was used, increasing the risk of selection bias. As some pharmacists did not respond to the survey and to all of the included questions it is possible that the ones responding were the ones more interested in the topic (Henderson & Page, 2007). This may compromise generalization of results beyond this sample. Another limitation could also be the high level of dropout (26.3%).
When looking at the questions regarding the amount of exercise practiced it is also possible that there could be an overestimation of the data related to these behaviors.

Besides, the questionnaire was sent to the technical directors of the pharmacists and there was no guarantee they shared it with other pharmacists. There is also the possibility that other personal (such as pharmacy technicians) filled the survey as they might had access to it.

Despite these limitations, the way the survey was designed allowed reaching a great number of pharmacists in a short period of time, which provides a robust result that can be a good start for future studies in this area. Given the novelty of this topic, it also provides a new perspective and data that can support future investments in the pharmaceutical sector in the area of physical activity promotion.

Conclusion

The present study aimed to characterize the promotion of physical activity in Portuguese community pharmacists. The main findings suggest there is clearly more that can and should be done to materialize their full potential.

The frequency of counselling is very low, meaning that more can be done to increase the number of people this advice reaches. The use of verbal counselling is the most practical one, but other types of promotion should be considered as well, such as written information. The promotion of walking as a natural way to be more active is of most importance and should be kept as the first tool in the pharmacists' toolbox of advice.

There is room to improve pharmacists' training and capacity to be more confident when providing brief advice, especially in people with chronic diseases that are frequent users of the pharmacies.

The pharmacists seem to be motivated to engage in the promotion of behaviors that include more physical activity and also recognize the importance of physical activity as a tool in health and the role of the pharmacist to promote it.
When looking at opportunities for this promotion we identify more barriers, and these opportunities can exist more on the social sphere, signaling the pharmacies and the pharmacists as reliable source of advice for more physical activity or from the context and resources that the pharmacy has available, being them the pharmacists or other resources the pharmacy might have available, such as leaflets or other educational materials.

As the pharmacists have limited knowledge and resources to develop a closer follow-up on the patient's levels of physical activity, a future solution could be to implement a personalized service with a qualified exercise physiology inside the pharmacies.

Overall, there could be a better use of the full extent of the areas of promotion and using communities as networks to sustain the maintenance of physical activity

behaviors, together with the pharmacy. There needs to be an investment in linking the pharmacies as a place for the promotion of physical activity, where one can get reliable advice, in order to increase and sustain the levels of physical activity of the populations.

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Appendix 1 - Questionnaire about physical activity promotion by pharmacists

Dear pharmacist,

The present study is part of a thesis of the Masters in Exercise and Health of the Faculty of Human Motricity of the University of Lisbon, with the collaboration of the Center for Studies and Evaluation in Health (CEFAR) of the National Association of Pharmacies (ANF). It is intended for accredited community pharmacists and aims to collect information on the promotion of physical activity in Portuguese community pharmacies.

The questionnaire takes 10 to 15 minutes to complete.

Your participation involves completing an online questionnaire on a platform, you must select the options according to the instructions in the questionnaire itself.

Your participation is voluntary, and you may refuse to participate. If you decide to participate in this study it is important to have knowledge that you can give up at any time, without any kind of consequence for you. In case you decide to leave the study, your relationship with the Faculty of Human Kinetics (FMH) will not be affected.

Your participation will help to characterize the promotion of physical activity in Portuguese community pharmacies. There are no apparent risks to your participation, besides the time spent on it. In case of any occurrence the principal investigator assumes responsibility for this same occurrence and the latter should be contacted in case of urgency.

All data collected will be treated confidentially, with no personal identification in the report or publication of the study. Upon completion of the investigation, all data will be deleted by the principal investigator. The results are aimed at a master's thesis of the FMH and subsequent publication in a journal of the area of physical activity.

For any question related to your participation in this study, please contact: rubenviegas23@gmail.com

To start, click the arrow below:

(By starting the questionnaire, I declare that I agree to participate in this study for which sufficient information has been given to me)

(1-5 → **Professional and socio demographic characterization**)

1. Gender:

M/F

2. Date of Birth:

____

3. District/Working region:

Aveiro – Beja – Braga – Bragança - Castelo Branco – Coimbra – Évora – Faro – Guarda – Leiria – Lisboa – Portalegre – Porto – Santarém – Setúbal - Viana do Castelo - Vila Real – Viseu – Açores - Madeira

4. Years of experience in community pharmacy

____

5. Regarding location and main profile of clients you would say your pharmacy is:

Rural, aged population
Rural, mixed age population
Rural, young population
Neighborhood pharmacy, aged population
Neighborhood pharmacy, mixed age population
Neighborhood pharmacy, young population
Commercial pharmacy, aged population
Commercial pharmacy, mixed age population
Commercial pharmacy, young population
Does not know/ Does not respond

(6-10→ **Characterization of the actions of physical activity promotion**)

6. **Do you promote physical activity in your daily practice?**

Yes
No

If you answered No, please go to question 12

7. How do you classify the frequency of promoting physical activity among your clients?

In no consultation
In few counseling
In around half of the consultations
In most consultations
In every consultation

8. In which area of physical activity do you intervene more often?

Sedentary behaviors (how to stop or reduce sitting time)

Active transportation (promotion of walking as daily transportation, etc)
Physical exercise / sports (ex. walking as physical exercise, etc.)
None of the above

9. Which types of physical activity promotion do you do together with your costumers? Evaluation of the performed physical activity
Written information (ex. Leaflets)
Verbal information (ex. suggestions of activities to perform)
Selling sports supplements
Measuring biometric parameters that relate to physical activity
Promotion of activities (ex. Walking groups)
Referral to community resources to practice more physical activity
Sports nutrition consultation
Other:_____

(if you selected "Referral to community resources to practice more physical activity") 10. Indicate which resources/ services in community where you usually refer your costumers in order for them to be physically more active:
Gyms
Activities promoted by the local authorities
Walking groups
Activities promoted by schools
Activities promoted by senior universities / daycare centers
Activities promoted by the pharmacy itself
Other: _____

11. Which kind of physical activity do you advise more frequently?
Walking
Running
Swimming / Hydrogymnastics / Aquatic activities
Gym classes (Fitness classes, Bodybuilding, etc)
Modalities (Football, Martial Arts, Athletics, etc)
Gymnastics classes
Dance activities
Activities like Yoga, Pilates or stretching
Other: _____

(12-20→ **Facilitators and barriers for physical activity promotion**)

12. Which importance do you attribute to the practice of physical activity in the population's health?
Not important
Of few importance
Not much nor less importance
Important

Very important

Doesn't know/ Doesn't respond

13. Which importance do you attribute to the promotion of physical activity in the pharmacies?

Not important

Of few importance

Not much nor less importance

Important

Very important

Does not know/ Does not respond

14. Which level of knowledge you consider you have regarding physical activity?

Very low

Low

Medium

High

Very high

Does not know/ Does not respond

15. According to the recommendation on physical activity practice in the general population, it seems adequate:

Complete at least 60 minutes of moderate physical activity per week

Complete at least 90 minutes of moderate physical activity per week

Complete at least 150 minutes of moderate physical activity per week

Complete at least 200 minutes of moderate physical activity per week

Does not know/ Does not respond

16. What is your confidence degree to promote your client's physical activity: Please use the following scale: 0 – Not very confident, couldn't promote physical activity; 10 – Very confident, could always promote physical activity.

a. Healthy adult: ____

b. Healthy child: ____

c. Elder: ___

d. Cardiovascular disease: ____

e. Neoplastic disease: ____

f. Psychiatric disease: ____

g. Osteoarticular disease: ____

h. Metabolic disease (p.ex. diabetes): ____

17. How often are you approached whit questions about physical activity?

Never

Rarely

At least once a month

At least once a week

Every day

18. In your daily practice, how much do you think these barriers stop you from promotion more physical activity in your costumers?

Please use the following scale: 1 – Not very relevant, it is not a barrier for physical activity promotion; 5 – Very relevant, stops most physical activity promotion

a) Lack of time to promote physical activity

b) Lack of technical knowledge in this area

c) Afraid of health risks

d) Lack of immediate interest from the costumers

e) Lack of coordination with other healthcare professionals

f) Lack of a specific place for this promotion

g) Low relevance during counseling

h) Not being usual this type of counseling

i) Not knowing opportunities for referral in the community (ex. Community physical activity programs / spaces where physical activity can be done)

j) Physical activity is not part of the role of the pharmacist

k) Not knowing exactly what to say/ask to counsel on physical activity

l) Forgetfulness (to talk about physical activity with the costumers)

m) The clients from this pharmacy have so many other problems that doing more physical activity is not a priority

n) There are no incentives for physical activity promotion in the pharmacies

o) I don't have great interest in physical activity promotion

Other: _____

19. Which level of importance do you attribute to the presence of physical activity professionals in the pharmacy, providing a specialized service in this area?

Not important

Of few importance

Not much nor less importance

Important

Very important

Does not know/ Does not respond

20. Did you ever had formation on physical activity / physical exercise?

Yes, pre-graduated
Yes, post-graduated
No, never

(21-23→ **Characterization of the amount of practiced physical activity**)

21. In a normal week, in how many days you do a fast walk or equivalent or superior intensity physical activity?
(p. ex. gym activities, riding a bike, practice an active sport, swimming/ hydrogymnastics, etc)

___

22. How much time do those activities last (in hours), in average, taking into account only the periods of movement (removing transitions or breaks)?

___

23. In a typical day, how much time (in hours), do you usually spend sitting? (Ex: in the car or other transports, in a desk, on the computer, watching TV, Reading, in the sofa or chairs or hanging out, during meals, etc. Do not include the time you spend sleeping (during the night or in naps during the day).

Thank you very much for your answer.
In case you have any questions, please contact rubenviegas23@gmail.com

___

Appendix 2 – Ethical Committee document

FMH FACULDADE DE MOTRICIDADE HUMANA

Conselho de Ética
para a Investigação

MEMBROS
Paulo Armada - Presidente
Paula Maria Bruno – Vice-Presidente
Ana Rodrigues
Analiza Silva
António Rodrigues
Augusto Gil Pascoal
Conceição Mendonça
Luis Yanez
Pedro Passos
António Rosado - Suplente
Celeste Simões - Suplente

Para:

Dr. Rúben Viegas
Faculdade de Motricidade Humana

Data: 12 de novembro de 2018

Projeto: "Physical Activity Promotion in the Portuguese Pharmacies"

Estado CEFMH: Positivo
Parecer CEFMH N.º: 18/2018

Este Conselho analisou o projeto em epigrafe. Confirma-se que o mesmo está em conformidade com as diretrizes nacionais e internacionais para a investigação cientifica que envolve seres humanos, incluindo a Declaração de Helsinquia sobre os Principios Éticos para a Investigação Médica em Seres Humanos (2013) e a Convenção sobre os Direitos do Homem e a Biomedicina ("Convenção de Oviedo", 1997).

O Presidente do Conselho de Ética para a Investigação da FMH

Paulo A. S. Armada da Silva

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