

Physical Activity and Outdoor Spaces

Before, During and After the COVID-19 Pandemic. PLAY LED Solution

Vânia Loureiro^{1,2,3,4}, Margarida Gomes^{1,2}, Iwona Sulowska-Daszyk⁵, Nuno Loureiro^{1,2,3}

¹ School of Education, Institute Polytechnic of Beja, Portugal

² Laboratory of Physical Activity and Health, Polytechnic Institute of Beja, Portugal

³ Institute of Environmental Health (ISAMB), Lisbon, Portugal

⁴ Research Group on Physical Activity, Promotion of Values and Education, HUM-954, Huelva, Spain

⁵ Akademia Wychowania Fizycznego im. Bronisława Czecha w Krakowie, Department of Clinical Rehabilitation

vloureiro@ipbeja.pt, margarida.gomes@ipbeja.pt, iwonasul@gmail.com, nloureiro@ipbeja.pt

Summary- The coronavirus disease (COVID-19) pandemic has caused an exceptional lockdown, resulting in social isolation. In response this pandemic, many regions closed or restricted access to outdoor spaces such as municipal or public parks, community gardens, playgrounds, and many others. This results in a decrease of physical activity in the communities and in an increasing of the sedentary behaviours. Physical inactivity is one of the main risk factors for the development of chronic non-communicable diseases [1]. It is also reported the major active people prefer outdoor spaces for the practice of physical exercise. The PLAY LED solution is an interactive outdoor game, accessible for all generations, users of green and outdoor spaces resulting in a diversified, systematized and quality opportunity for physical activity. By applying game design elements and game principles in a non-game context, PLAY LED has developed an experience that leads sedentary people to get a physical activity opportunity, promoting active lifestyles in the community and also brain stimulation. The PLAY LED offer examples of strategies that may be implemented to reduce potential risks of COVID-19 transmission, challenging the modification of outdoor spaces to promote physical distancing; incite the use of all parks space; based on visual cues and restrict occupant capacity. On other and in order to help policymakers take new services and initiatives for the 21st century, PLAY LED could influence the behaviour and promote active lifestyles in society. It is a technological and innovative tool developed through interactive LED systems in which one of the main attractions is the fact that it is designed considering digital tools.

Keywords: Outdoor Recreation, Public Health, Exercise, Technology, Gamification

I. INTRODUCCIÓN

The COVID-19 disease caused by a new coronavirus, SARS-CoV-2 (severe acute respiratory syndrome coronavirus-2), has reached pandemic dimension worldwide [2]. Given the concerns about the increasing spread of COVID-19, infection control is imperative and safety precautions must be followed [3]. Staying at home has become an essential safety step that can limit infections from spreading widely. Also, in response to this pandemic, many regions closed or restricted access to outdoor spaces such as municipal or public parks, community gardens, playgrounds, and many others. This results in a decrease of physical activity (PA) in the communities and in an increasing of the sedentary behaviours. The home isolation result in a decrease of moderate-to-vigorous PA levels and increase in sedentary behavior [4]; in nonexercise behaviors that lead to a

increasingly sedentary lifestyle, known to result in a range of chronic health conditions [5] and to anxiety and depression [6]. Fitbit, Inc., an American company that develops wearable devices that track an individual's PA level, has recently shared PA data from 30 million users and demonstrates a substantial reduction (ranging from 7% to 38%) in average step counts in almost all countries during the week ending March 22, 2020, as compared with the same period last year [7]. Maintaining regular PA and routinely exercising in a safe home environment is an important strategy for healthy living during the coronavirus crisis [8]. The PLAY LED offer examples of strategies that may be implemented to reduce potential risks of COVID-19 transmission, challenging the modification of outdoor spaces to promote physical distancing; incite the use of all parks space; based on visual cues and restrict occupant capacity. On other and in order to help policymakers take new services and initiatives for the 21st century, PLAY LED could influence the behaviour and promote active lifestyles in society.

II. POLICIES FOR PROMOTING PHYSICAL ACTIVITY

Recognizing the importance of policy for promoting physical activity (PA), the scientific community and governments increased policy-making efforts by international institutions, (e.g., World Health Organization PA Strategy for the European Region 2016–2025 [9]; Global PA Action Plan [10]; and the EU Council Recommendation on Health-Enhancing PA across Sectors [11] disseminate recommendations and guidelines for health behavior change [12]. Health policy is defined by the World Health Organization (WHO) as “decisions, plans, and actions that are undertaken to achieve specific health care goals within a society” [13]. Work towards by developing a cross sectoral approach involving policy areas including sport, health, education, environment and transport as well as other relevant sectors and in accordance with national specificities. WHO Global Recommendations on Physical Activity for Health and policy guidelines for the promotion of PA encourage PA, both structured and less organized, such as free outdoor play as a part of daily life whereas outdoor low-cost physical activity should be promoted as an alternative to the traditional and more expensive approaches [9]. Past research has found relationships among walkable neighborhood designs, support for PA and healthy eating, and the risk of being overweight and/or obese [14]-[15]. According to the last European

Eurobarometer of PA the use of outdoor environments is the preferred by Portuguese for the practice of outdoor sports, whether for hiking, group exercises or even for fun and social entertainment with society (family, friends....) [16]. Although, achieving minimum PA levels (i.e., 150 min of moderate to vigorous physical activity, 75 min/week of intensive physical activity, or a combination of both) and reducing sedentary behavior in times of social isolation have become a challenge and, at the same time, a necessity for everyone.

Despite, new and more attractive outdoor spaces inspire and influence the population in their habits and practices of daily physical exercise, promoting the health of civil society through:

- Increased attractiveness of equipment in the green areas of the urban areas.
- Recommended strategy for the practice of non-supervised physical exercise.
- Supported by communication tools.
- Offer strategies to promote active lifestyles.
- Promote interactive and technological equipment for users of outdoor environments.

III. BENEFITS OF BEING ACTIVE IN OUTDOOR AREAS

The Constitution of the World Health Organization, which came into force on April 7, 1948, defined health “as a state of complete physical, mental and social well-being.”

The benefits of PA, including regular sporting activity and exercise, across the life course covers a range of health benefits. The particular relevance of PA to cardiovascular diseases, diabetes, musculoskeletal health and rehabilitation, as well as chronic obstructive pulmonary disease and some types of cancer, has been identified [17]. These recommendations should also acknowledge the potential of physical activity to preserve cognitive function and reduce the risk of dementia and the need to be very specific for certain groups, such as older adults, for whom physical activity must include strength training and balance, in particular to prevent falls [18].

IV. PLAYLED: A NEW APPROACH FOR OUTDOORS ENVIRONMENTS

PLAYLED has developed an experience that leads sedentary people to get a PA opportunity, promoting active lifestyles in the community and also brain stimulation. This solution appears as a reply for outdoor sports equipment based on the applicability of led's whereas accessibility and interactivity according to the urban conditions of each site are the main characteristics of this product. The use of digital technologies there may be an opportunity for social interaction and relevant to mitigate the deleterious effects of increased physical inactivity and social isolation. The goal is to develop a gamification experience that promotes the adherence of sedentary people to a structured exercise plan and, more importantly, promote active lifestyles. Despite, this is achieved with a network of wireless sensors that, attached to playground elements, transforms them into physical interfaces controlled by apps integrated in mobile devices.

The PLAYLED offer examples of strategies that may be implemented to reduce potential risks of COVID-19 transmission, challenging the modification of outdoor spaces

by promoting physical distancing; incite the use of all parks space; based on visual cues and restrict occupant capacity.

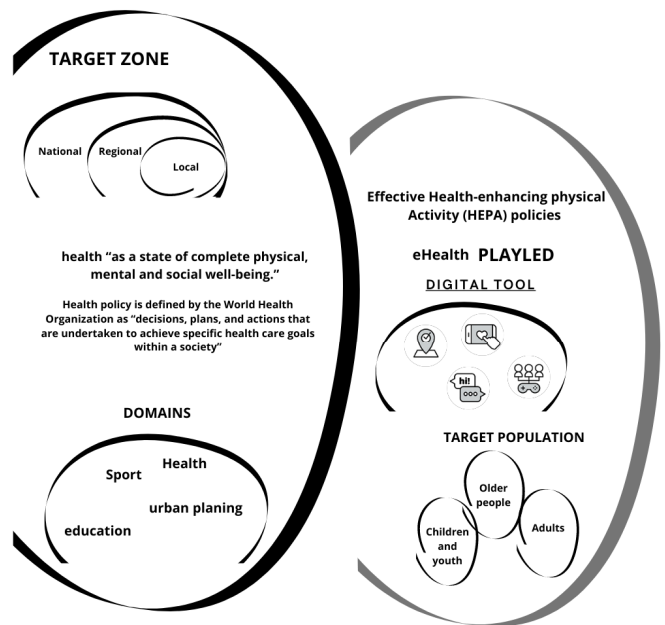


Fig. 1. General structure of PLAYLED

V. BENEFITS FOR MUNICIPALITIES

Encouraged good practices, UP AGAIN SENIOR (<https://www.facebook.com/upagainseior/>) created the @REDEUP. This was one of the initiatives undertaken which was based on the following steps:

- Identify and inform the Municipalities about the PA Levels of the population, for after establishing general objectives in relation to the 2019 indicators so that the consequences of the Pandemic can present the minimum possible impacts in this population at risk.
- Implementation of Exercise Plans and Monitorization control of PA Levels in elderly participants of Community Exercise Programs.

A. Benefits for community

PLAYLED appears as a response for users of outdoor environments as parks, garden, bike paths, entertainment centers. PLAYLED aims to be a tool of public and social utility for patients registered in the Direção Geral de Saúde (DGS) and also for those who want to use outdoor environments for practice of non-supervised PA in a safe environment through interactive and digital outdoor strategies.

B. Main characteristics of PLAYLED

The main characteristics of PLAY LED equipment are:

- Accessibility, interactivity and culturally adaptable according to urban conditions.
- The digital support allows users to use smartphones, tablets and other disposables in an outdoor environment as a tool for online gamification.

- The use of the equipment will allow a continuous recording and achievement of suggested targets as an intervention in the DGS on Health National System.
- Monitoring the level and intensity of PA daily performed and when using outdoor spaces with LED devices on the community.

This is an added value, since it will offer the physiologist of the exercise of the Health National System a general analysis of the indicators and levels of PA throughout the user's life cycle, consequently increasing the quality and proximity of the service provided.

VI. CONCLUSIONS

PlayLed is a gamefully designed mHealth tools that aim to support the population (with or without associated pathologies) in self-management of their quality of life and health, as well as influencing positive behavior change techniques to promote active lifestyles in global society. This solution is an interactive outdoor game, user-friendly for all generations, intended for users of green and outdoor spaces resulting in a diversified, systematized and quality opportunity for PA.

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