ORIGINAL ARTICLE

Gotta catch'em all: ready, set, (pokemon) GO!

Bjanka Purda [1] ✉ • Draženka Mačak [1]

Received: 27th September, 2019
Accepted: 28th October, 2019
DOI: 10.31382/eqol.191204

Abstract

Pokemon Go is a virtual reality game that mixes the smart mobile technology with real life exploration. The aim of this research is to investigate whether Pokemon Go app increases the levels of physical activity.

Thirty-two healthy subjects were included in this 5-week study (12 males and 20 females, age 18-49) and they were allocated into three groups, experimental group: new trainers (N=10) and control groups: regular trainers (N=11) and non-trainers (N=11). Level of physical activity was assessed using Pedometer – Step Counter Free & Calorie Burner that counts daily walking distance in km and steps. Subjects were instructed to provide screenshots of their km recorded.

At each level of measurement groups significantly differed in walking distance ($p<0.01$). The time did not have significant effect on the walking distance. The interaction effect was significant from fourth level to fifth level of measurement ($p<005$). LSD test revealed that regular trainers significantly differed from both, new and non-trainers, having the most walked distance. New trainers and non-trainers did not differ in the level physical activity in the first three weeks, but in the fourth- and fifth-week new trainers group significantly increased the levels of physical activity regarding non-trainers group (mean difference +21.688 and +15.688, respectively). In the first two weeks, the new trainers group walked 27km, and after the installation of the games, the increase was more than 10 km. It could be concluded that Pokemon Go app has impact on the levels of physical activity, but some period of time is needed for participants to learn how to play the game and enjoy it.

Keywords physical activity • Pokemon Go • mobile game.

✉ biankapurda94@gmail.com

[1] University of Novi Sad, Faculty of Sport and Physical Education, Novi Sad, Serbia

Introduction

The lower levels of physical activity have been observed as a risk factor for cardiovascular diseases and diabetes type 2 (Loprinzi & Pariser,2013). Also, the prevalence of obesity grows around the globe, which is associate with lower levels of physical activity (Mitchell, 2011). The need for new strategies for obesity reduction and the levels of physical activity increasing has been recognized (Waters et al., 2011), since numerous limitations in current polices and methodological approaches to obesity prevention exist (Baranowski & Lytle, 2015). Therefore, an urgent need to provide novel strategies to motivate people to go outside and be more physically active (LeBlanc & Chaput, 2017). Pokemon Go is a virtual reality game that mixes the smart mobile technology with real life exploration. It has been renowned that in 2016 the game seized the whole world, since the young and seniors were actively downloading and playing, joining the gaming community (Chong et al.,2018). Gabbiadini et al (2018) revealed positive effect of playing the game on the physical activity levels, changing participants' behavior from sedentary to active one

but also suggested that the game did not have reliably effects on people's behavior in general. However, they explained that the increase in physical activity levels is rather induced with the exercise required by the game (Gabbiadini et al., 2018). Hino et al (2019) have also revealed significant differences between those who play the game and those who do not in the number of steps. The group who played the game maintained the number of steps during the winter, unlike non-players who decreased the steps. Pokemon GO can model new relation between people and outside world, encouraging them to engage in physical activity. Ma et al showed that location-based virtal reality games, such as Pokemon GO, have the potential to be a “global public health intervention tool” (Ma et al., 2018). Pokemon GO is one of the first Smartphone-based game that can be used to promote a healthier lifestyle, reversing sedentary lifestyles, “with a big potential to be used in Health Education” (Finco et al., 2018).

The aim of this research is to investigate whether Pokemon Go app increases the levels of physical activity.

Method

Thirty-two healthy subjects were included in this 5-week study (12 male and 20 female, age 18-49) and were allocated into three groups, experimental group: new trainers (N=10, male: 1, female: 9, mean age 27.38±7.76) and control groups: regular trainers (N=11, male: 9, female:2 mean age 24.61±4.11) and non-trainers (N=11, male: 2, female: 9, mean age 27.83±5.95). An inclusion criterion was the use of Android smart phones.

Subjects in new trainers group have downloaded the game which they have never played, so they were familiarized with the app two weeks from the beginning of the experiment, and for that time they did not play the game. In the regular trainer group subjects were regular Pokemon Go players, who played the game for minimum 3 years. They have carried on with playing the game. Non-trainers group did not play any app that could induce motivation for physical activity, and they carried on with their regular life.

Level of physical activity was assessed using Pedometer – Step Counter Free & Calorie Burner that counts daily walking distance in km and steps. Subjects were instructed to provide screenshots of their km recorded. The walking distance was recorded in kilometers and was reported after each week (5 measurements) for each group.

Experimental protocol

After the app is installed on phone, smartphone is designed to project actual location where virtual pokemons hide. Each of step is visible and follows on the screen, and the game begins when you start to capture the pokemons. The pokemons will appear in area but you will physically need to reach a place in the environment where the Pokémon has indicated. Likewise, in order to spin Pokestops or fight in the Gyms, you must come at a maximum of 1 meter. The "Raid Pass” and "Ex-Raid Pass" can be obtained in Gyms, which coaches use for combat, most commonly for "Legendary Lunch Hour", which lasts for an hour and trainers are going to Gyms for a fight. In the game there are "Eggs" of 2km (green), 5km (orange), 7km (pink) and 10km (purple), which needs to walk with them. Similarly, some of pokemon requires walking for 10km, 15km or 20km, in order to evolve. Trainers makes most kilometers for "Community Day", which lasts 3h, once a month, when trainers are crossing even up to 25km for that 3h. Niantic has introduced that trainers can get special prizes if they walk peer week 5km, 25km or 50km. The more kilometers they walk, the rewards are more significant. For that reason, most trainers are struggling to cross over 50km every week.

Results are presented as mean and standard deviation for each group and for each level of measurement. Normality assumption for all data before and after intervention was checked Shapiro-Wilk test. Mixed ANOVA (Roy’s Largest Root) was used to test the hypothesis and effect of time (5 levels), effect of group (3 groups) and their interaction are reported. Post hoc analysis with LSD correction was done for multiple comparisons. Level of significance was set at $p < 0.05$.

Results

Descriptive statistics for depended variable are presented in Table 1. At each level of measurement groups significantly differed in walking distance, $F(2,29) = 70.524$, $p<0.01$, ES=82.9%. On average regular trainer group walked the most, while new trainer group walked less than trainer group, but more than non-trainer group (Graph 1.). The time did not have significant effect on the walking distance, $F(4,26) = 1.550$, $p=0.217$, ES=19.3%. In trainers group, the walking distance did not change

significantly over time, from first to second, p = .925, second to third, p = .092, third to fourth, p = .684, but from fourth to the last week the change of 19.95% was significant, p = .035. In the non-trainers group, the walking distance did not change significantly over time, from first to second, p = .063, second to third, p = .233, third to fourth, p = .432, and fourth to fifth week, p = .238. Also, the average walking distance did not change significantly over time, from first to second, p = .883, second to third, p = .876, third to fourth, p = .104, and fourth to fifth week, p = .444. However, time x group interaction was significant, F (4,27)=3.010, p=0.036, ES=30.8%. The interaction effect was significant from fourth level to fifth level of measurement, F (2,29) =3.840, p=0.033, ES=20.9%. LSD test revealed that regular trainers significantly differed from both, new and non-trainers, having the most walked distance. New trainers and non-trainers did not differ in the level physical activity in the first three weeks, but in the fourth- and fifth-week new trainers group significantly increased the levels of physical activity regarding non-trainers group (mean difference +21.688 and +15.688, respectively).

Table 1. Mixed ANOVA

	Trainers (N=11)		Non-trainers (N=11)		New trainers (N=10)		Time* group
Km per week	Mean±SD	Δ (%)	Mean±SD	Δ (%)	Mean±SD	Δ (%)	p value
1 (km)	71.09±10.37		20.34±10.82		27.72±8.70		
2 (km)	71.40±23.20	0.43%	15.27±8.85	-24.94%	26.93±12.48	-2.83%	0.651
3 (km)	61.98±13.82	-13.19%	16.21±9.58	6.18%	28.17±17.98	4.60%	0.260
4 (km)	59.42±15.16	-4.14%	14.68±10.15	-9.44%	36.37±17.61	29.11%	0.207
5 (km)	71.27±17.02	19.95%	17.51±15.20	19.28%	33.20±15.51	-8.72%	**0.033**

Legend: Δ (%) - percentage of change compared to the previous week; p-value – significant level for time*group interaction

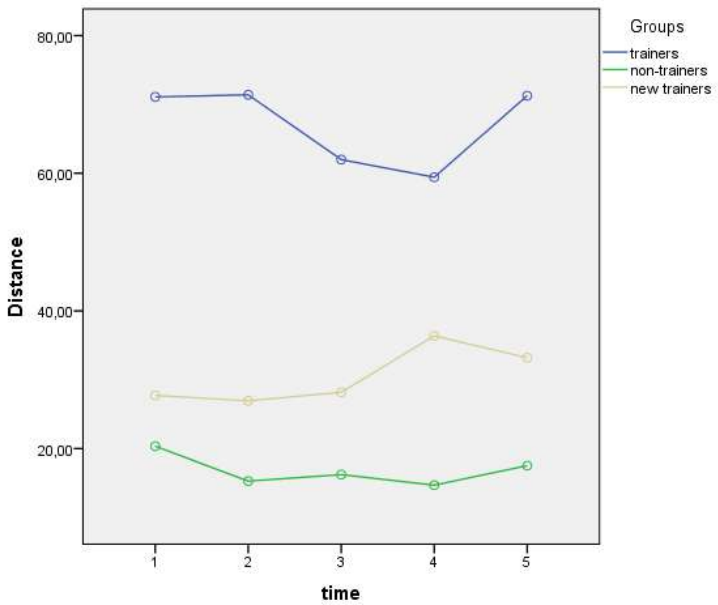

Figure 1. Physical activity (total distance walked in km) from pre- to post-test and after each week for all groups

Discussion

The aim of the study was to investigate whether the game Pokemon Go has an impact on physical activity in people. At the beginning of the study groups differed significantly in the levels of physical activity, what was maintained till the end of the experiment, where the regular Pokemon Go trainers were the most physically active group, while non-trainers had the least walking distance. The change in the level of physical activity from 2th to 4th week in the regular trainers group can be explained by the events in the game, i.e. by inserting new pokemons, Community Day (monthly once), Special Research and other events that make up a game of fun and leads people to move. The possible explanation for inconsistent interaction effect could be due to short time period of experimental protocol, because the increase was seen after two weeks of playing. When the regular trainers and non-trainers are compared, there was a clear difference between the kilometers in all five weeks, for more than 50km.

Experimental group, which included subjects that became Pokemon Go trainers, was less active that regular trainers in first to five weeks, but more than non-trainers in fourth and fifth week. Also, we can see the increased levels of physical activity in new trainers group just two weeks after the installation of the game for 29.11%. In the first two weeks, the new trainers group walked 27km, and after the installation of the games, the increase was more than 10 km. Similar findings had Xian et al. (2017), where increase in physical activity was for 34.8% or 1976 more steps per day after the experiment.

In regard to the non-trainers group, new trainers group did not diverge in the first three weeks, but afterwards difference exist. The one week of playing was enough to evoke changes in the levels of physical activity in new-trainers group, in contrast to Ma et al. (2018) study that showed increase in physical activity for 18.1% after 21 days.

Pokémon Go substantially increased physical activity among players for up to 1 week after they started playing the game (Ni et al., 2018). In 2 different studies, (He at al., 2017) enjoyment in Pokémon Go playing was the primary predictor of physical activity. Although personality characteristics did not predict the total distance that players walked when playing Pokémon Go, agreeableness, perseverance, and premeditation predicted their play after 6 months (Lalot et al., 2017).

It could be concluded that Pokemon Go app has impact on the levels of physical activity, but some period of time is needed for participants to learn how to play the game and enjoy it. Also, it has been observed that playing Pokemon Go enhances social interactions, but this was beyond the scope of this study.

We would like to point out the limitation of the study that is the lack of standardization of Pedometer – Step Counter Free & Calorie Burner application. Also, wide range of subjects' age and small sample size could be acknowledged as the limitation of the study as well. Finally, the daily unorganized and organized physical activity was not assessed but could be tracked in the future studies in order to report clearer effects of playing Pokemon Go app.

References

Baranowski, T. (2019). Increasing physical activity among children and adolescents: Innovative ideas needed. *Journal of Sport and Health Science , 8* (1), 1-5.

Baranowski, T., & Lytle, L. (2015). Should the IDEFICS outcomes have been expected? *Obesity Reviews , 16*, 162-172.

Barkley, J., Lepp, A., & Glickman, E. (2017). "Pokemon GO!" May Promote Walking, Discourage Sedentary Behavior in College Students. *Games for Health Journal , 6* (3), 165-170.

Chong, Y., Sethi, D., Loh, C., & Lateef, F. (2018). Going Forward with Pokemon Go. *Journal of Emergencies Trauma and Shock , 11* (4), 243-246.

Finco, M., Rocha, R., Fao, R., & Santos, F. (2018). Let's Move! The Social and Health Constributions From Pokemon Go. *International Journal of Game-Based Learning , 8* (2), 44-54.

Gabbiadini, A., Sagioglou, C., & Greitemeyer, T. (2018). Does Pokemon Go lead to a more physically active Life style? *Computers in Human Behavior , 84*, 258-263.

Hino, K., Asami, Y., & Lee, J. (2019). Step Counts of Middle-Aged and Elderly Adults for 10 Months Before and After the Release of Pokemon GO in Yokohama, Japan. *Journal of Sport Medical Interner Research , 21* (2), e10724.

Koh, H., Oh, J., & Mackert, M. (2017). Predictors of playing augmented reality mobile games while walking based on the theory of planned behavior: web-based survey. *Journal of Medical Internet Research , 5*, e191.

Lalot, F., Zerhouni, O., & Pinelli, M. (207). "I wanna be the very best!" Agreeableness and perseverance predict sustained playing to Pokemon Go: a longitudinal study. *Games Health Journal* , 271-278.

Loprinzi, P. D., & Pariser, G. (2013). Cardiorespiratory Fitness Levels and its Correlates Among Adult with

Diabetes. *Cardiopulmonary Physical Therapy Journal , 24* (2), 27-34.

Ma, B., Ng, S., Schwanen, T., Zacharias, J., Zhou, M., Kawachi, I., et al. (2018). Pokemon GO and Physical Activity in Asia: Multilevel Study. *Journal of Medical Interner Research , 20* (6), e217.

Mitchell, N. S., Catenacci, V. A., Wyatt, H. R., & al., e. (2011). Obesity: Overview of an Epidemic. *Psychiatric Clinics of North America , 34* (4), 717-732.

Ni, M., Hui, R., Li, T., Tam, A., Choy, L., Ma, K., et al. (2018). Augmented reality games as a new class of physical activity interventions? The impact of Pokemon Go use and gaming intensity on physical activity. *Games Health Journal* , 10.1089/g4h.2017.0181.

Waters, E., de Silva-Sanigorski, A., Hall, B., Brown, T., Campbell, K., Gao, Y., et al. (2011). Interventions for preventing obesity in children. *Cochrane database of Systematic Reviews* (12), CD001871.

Xian, Y., Xu, H., Xu, H., Liang, L., Hernandez, A., Wang, T., et al. (2017). An Initial Evaluation of the Impact of Pokemon GO on Physical Activity. *Journal of th American Heart Association , 6* (5), e005341.

How to cite this article:

APA: Purda, B., & Mačak, D. (2019). Gotta catch'em all: ready, set, (pokemon) GO! *Exercise and Quality of Life, 11*(2), 35-39. doi:10.31382/eqol.191204

MLA: Purda, Bjanka and Draženka Mačak. "Gotta catch'em all: ready, set, (pokemon) GO!" *Exercise and Quality of Life* 11.2 (2019): 35-39.

Chicago: Purda, Bjanka, and Draženka Mačak. "Gotta catch'em all: ready, set, (pokemon) GO!" *Exercise and Quality of Life* 11, no. 2 (2019): 35-39.