Improving Diabetic Patients' Motivation to Exercise Using a Mobile Application.

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Introduction

Exercise delivers physical and psychological benefits for those diagnosed with diabetes, and as per presented evidence, people living or at risk of developing diabetes, lack the appropriate motivation or social support to start and maintain an exercise regimen. Technology-Assisted interventions may be beneficial in delivering lifestyle interventions that can help patients achieve and increase their willingness to adhere to exercise.

Background and Significance

Exercise and mobile applications

Mobile fitness applications encourage people to start exercising, stay on track and motivated.

Exercise and social support

The literature indicates that diabetic patients empowered by social support obtain better glycemic control level and demonstrated better self-care behaviors

Needs Assessment

Research is necessary to comprehend what helps lifestyle changes in people with and at risk for diabetes.

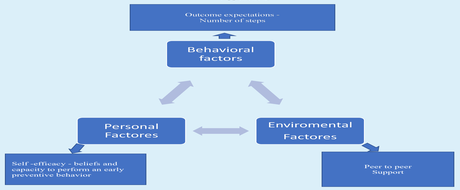
The health providers at the site felt that many of their patients fail to follow the exercise recommendations.

Providers are failing to incorporate social support and the use of mobile applications in their practice, to encourage and motivate patients to exercise

Clinical Question

Does social support while using a smartphone application helps to keep diabetic patients motivated to start and continue an exercise program?

Theoretical Framework – The Social Cognitive Theory-



Adapted from Alona Dalusung-Angosta, Reimund Serafica, & Shenir Moonie. (2015). Measuring enjoyment of ballroom dancing in Filipino Americans using the physical activity enjoyment scale: Asian/Pacific Island Nursing Journal, 2(2), 1–9. https://doi.org/10.1177/2373666581588320

Method

Setting: Private physician's office in Central New Jersey

Inclusion criteria

- English speaking diabetic patients ages 30 to 70 years with a smartphone
- Comfortable using a fitness application
- Healthy enough to walk at least 30 minutes daily.

The exclusion criteria

- Non-diabetic patients
- Patients that don't own a smart phone
- Patients 70 years old and older
- Diabetic patients unable to practice any physical exercise
- Patients who fail the Physical Activity Readiness Questionnaire (PAR-Q)
- The study lasted four weeks
    - 2 in person meeting
    - 2 follow-up phone calls

- Consent was obtained prior to participation
- Patients completed a pre-test to determine participation and a post test all adapted from previous studies

Data Analysis

Descriptive statistics was used to present demographic data that was presented as frequencies / percentages. Analytical non-parametric Wilcoxon signed ranked test was used to compare mean MPAM-R scores pre and post intervention. Data obtained from questions about motivation using mobile app were displayed using descriptive statistics

Results

Table 1: Demographic Data

Characteristics	Frequency	Percent
Age group		
30-39 years old	3	50.0
40-49 years old	2	33.3
50-59 years old	1	16.7
Total	6	100
Gender		
Female	6	100
Use of Mobile app for exercise		
Yes	6	100
Frequency to exercise		
Never	2	33.3
1-3 times a week	2	33.3
3-5 times a week	2	33.3

Table 2: Motivation to exercise using an app or a partner

Variable	Number of Participants	% Total
Fitness app motivate to walk		
Yes	3	60%
No	2	40%
Partner motivate to walk		
Yes	0	0%
No	6	100%

- Analytical non-parametric Wilcoxon signed ranked test was used to compare mean MPAM-R scores pre and post-intervention.
- The mean motivation score pre-intervention was 108. The mean motivation score post-intervention was 142.
- The Wilcoxon signed ranked test was done and showed no significant difference in mean scores from pre to posttest, p=0.69.
- Despite a numerical increase in mean motivation score post-intervention, this increase was not statistically significant, meaning that there is no certainty that the intervention improved the motivation of participants to exercise.

Discussion

•Lack of statistical significance- Due to small sample size of the project that affected statistical power to detect differences.

•The numerical increase in patient's motivation in this project is similar to results in the published literature

•The use of a mobile application increase the number of steps a patient takes overtime (Block et al., 2015).

•The fitness app and the workout partner proved to increase the participants' accountability, which increased their motivation to exercise and eventually will help with controlling their diabetes

Limitations and Barriers

- The small sample size might affect the results of the project (reduced statistical power to detect difference pre and post intervention)
- Short follow-up period and limited number of patients' meeting (didn't allow enough time for participants to develop and maintain an exercise habit)
- Technology problems

Conclusions

•The study showed a numerical increase in patients' motivation to exercise

•No statistically significant difference in motivation score post-intervention

•Future studies should be conducted to determine whether mobile applications and other innovative approaches increase motivation and adherence to exercise and, hopefully, improve long-term clinical outcomes among patients with diabetes

References

Alharbi, M., Gallagher, R., Neubeck, L., Bauman, A., Prebtit, G., Kirkness, A., & Randall, S. (2017). Exercise barriers and the relationship to self-efficacy for exercise over 12 months of a lifestyle change program for people with heart disease and diabetes. *European Journal of Cardiovascular Nursing*. 16(4), 309–317. https://doi-org.proxy.libraries.rutgers.edu/10.1177/1474515115606547

American Diabetes Association (2018 a). *Diabetes Basics*. Retrieved from http://www.diabetes.org/diabetes-basics/?loc=db-slabnav

American Diabetes Association (2018 b). *The Burden of Diabetes in New Jersey*. Retrieved from http://main.diabetes.org/dorg/assets/pdfs/advocacy/state-fact-sheets/New.Jersey2018.pdf

American Diabetes Association (2018 c). *Economic Costs of Diabetes in the U.S. in 2017*. Retrieved from http://care.diabetesjournals.org/content/early/2018/03/20/dci18-0007

American Diabetes Association (2018 d). *What we Recommend*. Retrieved from http://www.diabetes.org/food-and-fitness/fitness/types-of-activity/what-we-recommend.html

Arda Sürücü, H., Büyükkaya Besen, D., & Erbil, E. Y. (2016). Empowerment and social support as predictors of self-care behaviors and glycemic control in individuals with type 2 diabetes. *Clinical Nursing Research*, 27(4), 395–413. https://doi-org.proxy.libraries.rutgers.edu/10.1177/1054773817701403Centers for Disease Control and Prevention. *Diabetes Home*. Retrieved from https://www.cdc.gov/diabetes/home/index.html

Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, 31(2), 143–164. https://doi.org/10.1177/1090198104263660

Block, G., Azar, K., Romanelli, R., Block, T., Hopkins, D., Carpenter, H.. (2015). Diabetes prevention and weight loss with a fully automated behavioral intervention by email, web, and mobile phone: A randomized controlled trial among persons with prediabetes. *Journal of Medical Internet Research*, 17(10), e240. https://doi.org/10.2196/jmir.4897

Colberg, S., Sigal, R., Yardley, J., Riddell, M., Dunstan, D., Dempsey, P. (2016). Physical activity/exercise and diabetes: A position statement of the American Diabetes Association. *Diabetes Care*, 39(11), 2065–2079. https://doi.org/10.2337/dc16-1728

Connelly, J., Kirk, A., Masthoff, J., & Macrury, S. (2013). The use of technology to promote physical activity in type 2 diabetes management: A systematic review. *Diabetic Medicine*. https://doi-org.10.1111/dme.12288

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