Short Report

Preliminary findings of how visual demonstrations of changes to physical appearance may enhance weight loss attempts

Moyez Jiwa\(^1\), Oksana Burford\(^2\), Richard Parsons\(^3\)

\(^1\) Department of Medical Education, Curtin University, Perth 6845, WA, Australia
\(^2\) School of Pharmacy, Curtin University, Perth 6845, WA, Australia
\(^3\) School of Occupational Therapy and Social Work and School of Pharmacy, Curtin University, Perth 6845, WA, Australia

Correspondence: Moyez Jiwa, Department of Medical Education, Curtin University, GPO Box U1987, Perth 6845, Australia, Tel: +61 8 9266 1768, Fax: +61 8 9266 7993, e-mail: m.jiwa@curtin.edu.au

This study reports how showing a person an illustration of themselves following future weight-loss might impact on their actual future weight-loss. Weight was recorded weekly, 8 weeks before and 8 weeks after the intervention. A significant proportion of the 44 participants lost weight following the intervention: 17 vs. 29 (\(P=0.01\), chi-squared = 6.559). After the first 8 weeks, the mean change in weight was ñ0.32 kg [standard deviation (SD): 2.2, \(P=0.37\)]. The weight change after the second 8 weeks was ñ0.94 kg (SD: 1.7, \(P=0.001\)). The mean difference in weight losses between the two periods was ñ0.62 kg (SD: 2.1, \(P=0.08\)).

Introduction

Sustained weight loss is associated with a regimen of exercise and caloric control so that the body expends more energy than it is consumed. Such a regimen has been shown to require a commitment to a change in lifestyle.\(^1\) Recent research suggests that people who are shown an avatar (visual representation) of their future body shape may be more strongly motivated to adopt healthy behaviour.\(^2\) Such an avatar may serve as personal stimulation to sustained weight loss attempts.\(^3\) A recent randomized trial provides empirical evidence that presenting people with images of their future appearance following the adoption of more healthy lifestyle choices leads to behaviour change.\(^4\) Most Australians own a mobile telephone and 43% of Australians now own a smartphone.\(^5\) Such devices have almost limitless capabilities, including applications to present visual information that is personalized. Aim of this study was to study the influence of using an avatar on weight loss during a diet regimen.

Methods and procedures

The Curtin Human Research Ethics Committee (HR 211/2013) approved the project. An application (app) prototype to demonstrate the effect of lifestyle on personal appearance (Future Me) was developed by the research team. The key features of this application are shown as Supplementary data. Future Me is programmed to display body images based on the results of the Mifflin-St Jeor equations.\(^6\) A longitudinal observational pre-post design was used to study the effect of the Future Me intervention. All study participants were weighed weekly for 8 weeks prior to recruitment. At week 8, they were given access to the app and weighed weekly for the subsequent 8 weeks. An effective weight loss programme involves modifying both diet and exercise and can be tailored to achieve consistent weight losses of ñ0.45–0.9 kg per week.\(^7\) To demonstrate a moderate effect from the use of the application as described it was estimated that 40 participants would be adequate.\(^8\) Participants were recruited as a convenience sample from two clubs of the Weight Watchers Federation of Western Australia.\(^9\) All participants were and remained members of the club throughout the 16 weeks. The participants were formally recruited to the study at week 8; they consented to providing their weight data obtained during the 8 weeks prior to the intervention and for the subsequent 8 weeks. Eight weeks was chosen as an adequate time required to demonstrate significant difference in weight loss between the phases of this preliminary study.

Intervention

Participants received a printed copy of their current and also their age-progressed Future Me self-image illustrating the projected impact of weight loss on their physical appearance at an interval of their choosing (0, 4, 8, 16 or 26 weeks). The number of calories to be consumed per day and the exercise regimen selected was used to calibrate the images. The app was available to the participating centres on a smart device connected to a printer. The participants were not required to have a personal device in order to participate. Each participant was given a printed copy of his or her preferred ‘Future me’ image alongside their current avatar at recruitment. Therefore the exposure of the participants to the ‘Future me’ image was daily. A staff member of the Weight Watchers club routinely recorded the participants’ weight on the same weighing scales each week. No other intervention was offered, and the researchers had no contact with the participants during the 8 weeks following the intervention.

Statistical analysis

Differences in weight from weeks 1 to 8 and from weeks 8 to 16 were calculated for each participant. The mean weight change and BMI change within each period was calculated, and paired t-tests were used to test the null hypotheses that no significant weight or BMI change had occurred, within each period and between the two periods. Statistical analyses were conducted using the SAS version 9.2 statistical software (SAS Institute Inc, Cary, NC, 2008).
Results

There were 44 subjects recruited to the study from two different Weight Watchers club sites. Approximately one in three members consented to participate, 41 were female. Six participants were lost to follow-up. The average age was 58.8 years (standard deviation (SD) 10.5), average BMI was 34.8 (SD 6.2). Missing data were handled as last observation carried forward. During the intervention phase of the study, subjects were more likely to lose weight, compared with during the control period. \( \text{Pre-intervention} -0.32 \text{kg (SD} 2.17) \ P = 0.37, \text{Post-intervention} -0.94 \text{kg (SD} 1.66) \ P = 0.001 \). There was no significant change in weight or BMI during the pre-intervention stage of the study, but the change was statistically significant during the intervention stage \( \text{for both weight loss and change in BMI} -0.35 \text{ (SD} 0.62) \ P = 0.001 \). However, the paired differences between the two stages did not reach statistical significance \( P = 0.08 \) and \( P = 0.09 \) for weight change and BMI change, respectively. See figure 1.

Discussion

We report one of the first studies to explore the impact of an intervention based on age-progression software to stimulate weight loss attempts. The only intervention offered, in addition to the advice received at the Weight Watchers club was the self-image of the participant’s body shape, as it might appear following weight loss. A target of weight loss was determined by the participants on their desired future appearance which, in the case of this app was moderated by the amount of exercise and calorie restriction required to achieve that goal. \(^1\) We did not find a significant effect of the intervention on the change in weight loss and BMI, while the change in weight loss and BMI in the intervention period did not differ significantly from the pre-intervention period. In this preliminary study, the subjects were older and the majority was female. The design of this study did not permit us to conclude that the intervention was itself a sufficient explanation for the improved weight loss after the intervention was delivered because of numerous potential confounding variables. These include the age of the participants, co-morbidities, side effects of their medications, their readiness and motivation for behaviour change and many others that would be more likely to be taken into account in a randomized trial. The reason for beginning this exploration was to determine if the intervention shows any promise in encouraging people who are trying to lose weight. If shown in a future trial to be effective the scope to provide a relatively low-cost and low-intensity intervention to stimulate weight loss attempts would be extremely valuable. The data from this preliminary study have therefore been used to inform the sample size calculations for a full randomized controlled trial. (Australian Clinical Trial Register Number 12613000883718)

Supplementary data

Supplementary data are available at EURPUB online.

Acknowledgements

We acknowledge the support of the Weight Watchers Federation of Western Australia during this study. We would like to thank Ian Brown and Dr. Gemma Ossolinski for cogent and constructive advice with drafting this manuscript.

Funding

This project was funded by Curtin University.

Conflicts of interest

None declared.

Key points

- This is one of the first studies to explore how age-progression software can motivate weight loss.
- Self-images may help people who have chosen to seek support for weight loss by serving to trigger greater attempts at weight loss.

References

3 Fogg, Brian J. Persuasive technology: using computers to change what we think and do. Ubiquity 2002;5:89–120.
Multiple chronic health conditions and their link with wealth assets

Deborah J. Schofield1,2, Emily J. Callander1,2, Rupendra N. Shrestha3, Megan E. Passey3, Simon J. Kelly4, Richard Percival4

1 NHMRC Clinical Trials Centre, University of Sydney, Sydney NSW 1450, Australia
2 School of Public Health, University of Sydney, Sydney NSW 2050 Australia
3 University Centre for Rural Health–North Coast, Lismore NSW 2480, Australia
4 National Centre for Social and Economic Modelling, University of Canberra, Canberra ACT 2601, Australia

Correspondence: Emily Callander, NHMRC Clinical Trials Centre, Locked Bag 77, Camperdown, NSW 1450, Australia.
Tel: +61 2 8036 5236, Fax: +61 2 9565 1863, e-mail: emily.callander@ctc.usyd.edu.au

Introduction

It is known that internationally, an individual’s economic status is closely linked to his/her health: those with ill health have lower rates of labour force participation in virtually all Organisation for Economic Co-operation and Development countries,1 and consequently, they have lower incomes and fewer wealth assets than those with good health.2–11 However, to date, most studies that have frequently, they have lower incomes and fewer wealth assets than those people who have stated they have any chronic health condition or consider themselves to have poor health generally 15 or aggregating


© The Author 2014. Published by Oxford University Press on behalf of the European Public Health Association. All rights reserved.

Multiple chronic health conditions 285

Background: There has been little research on the economic status of those with multiple health conditions, particularly on the relationship between multiple health conditions and wealth. This paper will assess the difference in the value and type of wealth assets held by Australians who have multiple chronic health conditions. Methods: Using Health&WealthMOD, a microsimulation model of the 45–64-year-old Australian population in 2009, a counterfactual analysis was undertaken. The actual proportion of people with different numbers of chronic health conditions with any wealth, and the value of this wealth was estimated. This was compared with the counterfactual values had the individuals had no chronic health conditions. Results: There was no change in the proportion of people with one health condition who actually had any wealth, compared to the counterfactual proportion had they had no chronic health conditions. Ninety-four percent of those with four or more health conditions had some accumulated wealth; however, under the counterfactual, 100% would have had some accumulated wealth. There was little change in the value of non-income-producing assets under the counterfactual, regardless of number of health conditions. Those with four or more chronic health conditions had a mean value of $17 000 in income-producing assets; under the counterfactual, the average would have been $78 000. Conclusion: This study has highlighted the variation in the value of wealth according to number of chronic health conditions, and hence the importance of considering multiple morbidities when discussing the relationship between health and wealth.