A Physical Activity Intervention to Increase the Level of Physical Fitness among Boys Aged 14-15 Years in Jeddah City, Saudi Arabia

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A thesis Submitted in fulfilment of the requirements of the degree of

Doctor of Philosophy

Faculty of Health

University of Technology Sydney

September 2018

Certificate of original authorship

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as part of the collaborative doctoral degree and/or fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Dedication

To My Beloved Father who passed away after long years struggling with his illness. I was dreaming to see and share this moment of finishing my PhD and celebrate together. He taught me to never give up and be proud of every step I take toward reaching my goal in this life. I ask Allah to forgive his sins and have mercy upon him as he had mercy upon me when I was child and grant him Paradise.

To My beloved Mother for all her prayers and practical help, without her immeasurable love, and her prayers I would not have come this far.

To My lovely brothers, especially my old brother Mohammad for his support (both emotional and financial). Thank you for all your advice that enable me to complete this thesis.

To my sweet sisters who deserve a heartfelt thank you, for motivation, words of encouragement, and celebrating each achievement along the way.

To my Country, the kingdom of Saudi Arabia for their support

Acknowledgements

After sincerely thanking Allah for all blessings and bounties, I would like to express my sincerest gratitude to my thesis supervisors' team for their contribution, assistance and guidance.

Professor David Sibbritt: I am very proud to have you as my supervisor and my exceptional thank you for your quiet, calm nature and brilliant which helped me keep in balance through my acknowledged –searching journey .thank you for the valuable feedback and kind support through all years of struggle .without you I would not have the reason or the willingness to accomplish my studies .words will never express how much your enduring faith in me has kept me going.

Professor Patricia M. Davidson: I highly appreciated all your support, invaluable advice and guidance you provided me over the past years .your insight comments and suggestions played a prominent role in improving the quality of my thesis. Thank you for conference presentation support.

Dr Phillip Newton: I am grateful to all you're graciously contributed throughout the thesis process. Thank you for your support and encouragement.

Abbreviations

ADA: Americans with Disabilities Act

BHF: British Heart Foundation

BMI: Body Mass Index

BOD: Burden of Disease

CDC: Center for Disease control and prevention

CVD: Cardiovascular Disease **DBP:** Diastolic Blood Pressure **HR:** Heart Rate

Kg: Kilogram

KSA: Kingdom of Saudi Arabia

MOC: Maximal Oxygen Consumption

MVV: Maximum Voluntary Ventilation

NASPE: National Association for Sports and Physical Education

NHANES: National Health and Nutrition Examination Survey **NWO:** Normal Weight Obesity

PA: Physical Activity

PAQ-C: Physical Activity Questionnaire for Older Children

PE: Physical Education

PF: Physical fitness

RCT: Randomized Controlled Trial

SD: Standard Deviation

SBP: Systolic Blood Pressure **20-mSR:** 20 meters Shuttle Run **US:** United State

WC: Waist Circumference

WHO: World Health Organization

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Abstract

The prevalence of obesity is increasing world-wide and is estimated to continue to increase over the next decade (Hruby & Hu 2015). The focus of this study is on childhood overweight and obesity in Saudi Arabia. Limited research has been conducted and consequently a limited amount of information is available on the level of obesity in Saudi children and adolescence.

The project involved the design, development and assessment of a physical activity intervention to improve physical fitness, increase physical activity levels and promote weight loss among school boys aged between 14 and 15 years living in the city of Jeddah, Saudi Arabia. The study is innovative in that it utilised a popular children's sport (soccer) in Saudi Arabia to improve levels of physical fitness and that the activity took place out of the school environment in a free government-run facility.

The report of research presented in this thesis begins with a comprehensive review of published literature on obesity interventions and school-based PA programs. The project used mixed methods research methodology. Qualitative data were generated from semi-structured interviews with school principals and teachers and used to inform the development of an obesity-related PA intervention program. Quantitative data were collected as part of a randomised controlled trial (RCT). The RCT was used to evaluate the efficacy and feasibility of a 12-week PA intervention program based on soccer, conducted in after-school hours at a local government sports centre.

The results showed that the intervention group significantly improved in the vertical jump test ($p<0.001$) and the Illinois agility test ($p<0.001$) over the 12 weeks (pre-test vs. post- test). Mean scores for the control group did not differ significantly over the 12 weeks (pre-test vs. post-test) in any of the three physical fitness measures or in terms of BMI. The intervention group differed significantly from the control group in terms of mean differences for outcomes in the beep test ($p<0.001$), vertical jump test ($p<0.001$), Illinois agility test ($p<0.001$) and BMI ($p=0.006$), with the intervention group improving relative to the control group across all four measures. These findings can inform future research on obesity-related PA intervention programs for

adolescents in other nations that face a similar childhood obesity pandemic. The study concludes with a number of recommendations, including that the government provide additional sports centres across Saudi Arabia.