

Title: The Aussie-FIT process evaluation: feasibility and acceptability of a weight loss intervention for men, delivered in Australian Football League settings.

Authors: Dominika Kwasnicka^{1,2,3,4}, Craig Donnachie⁵, Cecilie Thøgersen-Ntoumani^{1,2}, Kate Hunt^{1,5,6}, Cindy M. Gray⁵, Nikos Ntoumanis^{1,2}, Hannah McBride², Matthew D. McDonald^{1,2}, Robert U. Newton⁷, Daniel F. Gucciardi^{1,8}, Jenny L. Olson^{1,2}, Sally Wyke⁵, Philip J. Morgan⁹, Deborah A. Kerr², Suzanne Robinson², Eleanor Quested^{1,2}

Affiliations:

1. Physical Activity and Well-being Research Group, Curtin University, Perth, Australia
2. Curtin School of Population Health, Curtin University, Perth, Australia
3. SWPS University of Social Sciences and Humanities, Wroclaw, Poland
4. NHMRC CRE in Digital Technology to Transform Chronic Disease Outcomes, Melbourne School of Population and Global Health, University of Melbourne, Melbourne, Australia
5. Institute of Health and Wellbeing, University of Glasgow, Glasgow, UK
6. Faculty of Health Sciences and Sport, University of Stirling, Stirling, UK
7. Exercise Medicine Research Institute, Edith Cowan University, Perth, Australia
8. School of Allied Health, Curtin University, Perth, Australia
9. Priority Research Centre in Physical Activity and Nutrition, School of Education, University of Newcastle, Newcastle, Australia

Corresponding author: Eleanor Quested, School of Population Health, Curtin University, Perth, Australia, Tel: +61 8 9266 5693, email: eleanor.quested@curtin.edu.au

Funding Statement: This research was supported by the Western Australian Health Promotion Foundation (Healthway), through research grant 31953. CD would like to acknowledge the funding provided by the Understanding and Improving Health in Settings and Organisations programme (MC_UU_1207/12; SPHSU12) at the MRC/CSO Social and Public Health Sciences

Unit, University of Glasgow, which enabled CD conduct the focus groups described in this paper during a research visit to the Physical Activity and Well-being Research Group at Curtin University, Nov-Dec 2018.

Authors' Contributions

EQ, NN, CTN, KH, CG, RUN, DFG, SW, PJM, DAK, and SR conceived the project and obtained the project funding. EQ, DK, CD, CTN, KH, CG contributed to the development of the interview guides and conducted the data analysis reported in this manuscript. DK, JO, EQ and CD recruited participants. CD conducted all interviews. HB conducted coding of audio-recorded data. MM and DK contributed to data processing and interpretation. EQ and DK wrote the first draft of the manuscript. All authors contributed to the refinement of the manuscript and approved the final version.

Acknowledgements: Aussie-FIT builds on the Football Fans in Training (FFIT) program, the development and evaluation of which was undertaken by a research team led by the University of Glasgow with funding from various grants including a Medical Research Council (MRC) grant (reference number MC_UU_12017/3), a Chief Scientist Office (CSO) grant (reference number CZG/2/504), and a National Institute for Health Research grant (NIHR) (reference number 09/3010/06). The development and evaluation of FFIT was facilitated through partnership working with the Scottish Professional Football League Trust (SPFLT). We would like to thank male AFL fans (N=130) who participated in the Aussie-FIT study, and our six coaches and team of students and research assistants from Curtin University and Edith Cowan University.

Data Availability Statement: Data available on request due to privacy and ethical restrictions. The data that support the findings of this study are available on request from the corresponding author, EQ. The data are not publicly available due to restrictions, i.e., containing information that could compromise the privacy of research participants.

Abstract

Objective: This process evaluation aimed to evaluate the feasibility and acceptability of Aussie-FIT, a group-based weight loss intervention for men with overweight and obesity in Australia.

Design: Process data and data collected from: (1) six participant focus groups ($n=24$), (2) coach interviews ($n=4$), (3) audio recordings of Aussie-FIT sessions, and (4) post-program participant surveys ($n=93$) were analysed.

Main Outcome Measures: We explored the feasibility and acceptability of program setting and context, recruitment strategies, factors impacting implementation and mechanisms of impact.

Results: Recruitment via Australian Football League (AFL) clubs was highly effective; 426 men expressed interest within three days of advertising, 130 men took part. Program attendance was not consistently recorded by coaches. Coach interviews indicated a ‘core group of men’ participated in each session (typically 10-12 of 15 men). Program delivery proved feasible in the AFL context. Program acceptability and satisfaction were high. Internalisation of autonomous motives was identified as driving behaviour change. Behaviour change to support maintained weight loss was facilitated through habit formation, goal setting, and effective management of multiple goals.

Conclusion: Aussie-FIT sets a blueprint for future weight loss interventions that utilise behaviour change strategies and principles of self-determined motivation to support men to lose weight.

Keywords: Process Evaluation, Physical Activity, Diet, Weight Loss, Behaviour Change, Motivation, Self-determination

Word count: 8,233

Trial Registration: Australian New Zealand Clinical Trials Registry: ACTRN12617000515392.

Introduction

In 2016, more than 1.9 billion adults (39%), aged 18 years and above, were classified as overweight worldwide; of these over 650 million were classified as obese (13%) (WHO, 2018). Among Australian adults, two in three were classified as having overweight or obesity in 2017-2018, with greater prevalence in men than women (Australian Institute of Health and Welfare, 2018). Behaviour change programs that address this issue by supporting participants to adopt a healthier, less energy-dense diet and regular physical activity (PA) are the cornerstone of weight management (Jensen et al., 2014). Despite the high prevalence of overweight and obesity, few behaviour change programs targeting weight management have been designed to appeal to men (Robertson et al., 2014). Nevertheless, evidence shows men are willing to engage in healthy lifestyle programs when these are tailored for them (Sharp et al., 2020; Young et al., 2015).

Interventions that are theory-based, designed to align with men's values and interests, group-based, and include multiple behaviour change strategies, are shown to be more effective in changing men's lifestyle behaviours (Hunt et al., 2020; Sharp et al., 2020). A recent systematic review evaluated evidence-based strategies for treating obesity in men and concluded that weight loss for men is best achieved and maintained with the combination of improved diet, increased PA, and the application of behaviour change techniques (BCTs) (Michie et al., 2013). Mean difference in weight at 1 year, compared with no intervention, was -4.9 kg (95% CI -5.9 to -4.0 , $p < .0001$) (Robertson et al., 2017).

Football Fans in Training (FFIT) is a highly successful weight loss and healthy lifestyle program delivered to men with overweight and obesity who are football fans aged 35-65 years. It was originally delivered through professional soccer clubs in Scotland (Gray et al., 2013), but it has since been scaled up (via deliveries in over 40 professional clubs in the UK) and scaled out; adapted for delivery in different countries and different sports, such as rugby and ice hockey (Hunt et al., 2020). In response to the urgent need for public health programs to address

overweight and obesity among men in Australia (Department of Health, 2017), we recently adapted FFIT for the Australian culture and for delivery in the context of professional Australian Football League (AFL) clubs, namely the Aussie Fans in Training (Aussie-FIT) program (Kwasnicka et al., 2020; Quested, et al., 2018a).

Aussie-FIT includes many of the core features of the FFIT program, including self-monitoring of weight and steps, promotion of increased PA and diet modification, setting goals and action planning (Gray et al., 2013). Aussie-FIT was customised to the AFL context. Additional content was added to coach training and program sessions to support the development of self-regulated behavioural control explicitly by including motivational principles from Self-Determination Theory (SDT)(Ntoumanis et al., 2018). For example, the ‘red and green’ motivation concept was added as an educational tool to aid understanding of the importance of autonomous (‘green’) motives for behaviour change and limitation of the more controlled (‘red’ motives). Throughout the coaches’ delivery guide for the program, there were prompts for specific opportunities to support men to experience and recognise satisfaction of the psychological needs to feel autonomous, competent, and related. In SDT, satisfaction of these needs is considered as the bedrock of autonomous motivation to initiate and engage in health behaviours (Ntoumanis et al., 2020). In addition to promoting need supportive coaching, the coach training also included content to help the coaches recognise maladaptive styles of coaching behaviour, known as need thwarting (Bhavsar et al., 2019). Aussie-FIT also included strategies to promote behaviour change maintenance (Kwasnicka et al., 2016) from the outset of the program by introducing specific BCTs to target maintenance from the beginning of the program (Kwasnicka et al., 2020).

The Aussie-FIT pilot trial (n = 130) showed promising results in terms of effectiveness. The mean weight difference between intervention (n = 64) and wait list control (n = 66) groups at 3 months, adjusted for baseline weight and group, was 3.33kg (95% CI 1.89 – 4.77) and

percentage weight loss, similarly adjusted, was 2.88% (95% CI 1.48 – 4.28), both in favour of the intervention group ($p < 0.001$) (Kwasnicka et al., 2020). The intervention group's moderate-to-vigorous PA was higher than the control group. Moreover, at 3 months, the intervention group reported lower scores for high fat foods consumption and sugar consumption and higher levels of self-esteem, positive affect, basic need satisfaction for weight-loss behaviours, overall health, goal facilitation, habits for PA and habits for healthy eating, planning, and sleep quality.

Following the UK Medical Research Council's framework for conducting and reporting process evaluation studies (Moore et al., 2015), and in the context of current recommendations for intervention implementation (Aarons et al., 2017; Koorts et al., 2018), we describe the feasibility and acceptability of the adapted FFIT program for Australia, Aussie-FIT. Process evaluations provide insight into contextual influences upon intervention implementation and outcomes, and enable greater understanding of mechanisms of impact, and specifically how interventions facilitate change. A systematic, iterative approach was taken to adapt FFIT to create Aussie-FIT including stakeholder consultations (i.e., with men in Australia from the target population, personnel from local AFL clubs), review of relevant evidence specific to the Australian context, consideration of theoretical mechanisms of action to complement the core components of FFIT, and piloting of the adapted intervention (Quested et al., 2018a).

The aims of this study were to: (1) determine feasibility of program uptake, and attrition; (2) determine feasibility of intervention delivery in the AFL context in Australia; (3) evaluate program acceptability to men with overweight or obesity aged 35-65 years in Australia, and to coaches delivering the program; and (4) explore mechanisms of impact, with particular focus on adaptations for the Australian context and additional components added to Aussie-FIT which were not part of the original FFIT program.

Methods

Design of the Aussie-FIT trial

The full Aussie-FIT pilot protocol and main outcomes are published elsewhere (Kwasnicka et al., 2020; Quested, et al., 2018a). Briefly, we recruited 130 men (35-65 years old, BMI higher than 28) to attend the Aussie-FIT program as part of a pilot RCT. The two AFL clubs in Perth, Western Australia, publicised the study via social media and member emails. We undertook a two-group pilot waitlist RCT from May–December 2018. Recruitment activities occurred in April and May 2018, prior to baseline measures in each club. Both the intervention and wait-list control groups were measured at baseline, 3 months, and 6 months. The intervention group received the 12-week intervention following baseline, with outcomes measured immediately post-intervention (3 months) and maintenance effects at 3 months post-intervention (6 months). The wait-list control group received the 12-week intervention after the 3-month measures, and outcomes were assessed immediately post-intervention (6 months). The intervention included 12 weekly 90 minute sessions incorporating education on nutrition and PA, and PA sessions, delivered by trained coaches to groups of approximately 15 men at an AFL facility (Quested et al., 2018a). Six AFL coaches (4 male, 2 female) were recruited to deliver the program. Most (n = 4) but not all (n = 2) coaches currently or had previously worked with the target football club. Recruited coaches did not need any particular qualifications but were considered suitable if they had a personal passion for AFL, experience in coaching contexts, and personally valued the ethos of the program.

Design of the process evaluation

The multicomponent process evaluation of the Aussie-FIT program included: (1) focus groups and interviews with participants and coaches, (2) coded audio recordings of Aussie-FIT sessions, and (3) survey data from participants. All participating men and coaches were given the opportunity to participate in the focus groups, surveys and interviews. We also invited men who withdrew from the program to take part in individual telephone interviews to explore their reasons to discontinue. None of the men who discontinued agreed to be interviewed. This study

was designed to address three key aspects of context, implementation, and mechanisms of impact which according to the UK Medical Research Council's framework (Moore et al., 2015) are important to understand how programs such as Aussie-FIT work.

Focus groups and coach interviews

We conducted six face-to-face focus group discussions with 24 participants who had completed the program in the intervention arm or waitlist control arm deliveries (group size ranged from 2 to 7, 4 were completed at one club and 2 at the other); focus group interviews with program participants were completed in November and December 2018, within four weeks of the delivery of the second wave (i.e., the waitlist control group) of the program. Individual interviews with coaches were completed from mid-February 2019 to mid-March 2019. At completion of the program, participants were invited to take part in a focus group at the club facility. All men who were willing and available on the focus group dates and times were given the option to participate. There were no significant differences in any baseline characteristic of the participants who took part in the focus groups compared to those who completed the study, but on average they were slightly older ($M=51.05$, $SD=10.09$), and the majority were Caucasian, married or living with spouse, and in full time employment or self-employed. Focus groups were designed to explore the men's experiences of participation in Aussie-FIT, barriers to, and facilitators of engaging in specific components of the program, experiences of social support and behaviour change, and suggestions for future program amendments (Focus Group Manual – Online Supplement 1). Focus groups lasted on average 83 minutes (range 61 – 107 minutes); some interview participants had just completed the program at the time of their interview, whereas others had taken part in the first wave of the program, and so their interviews took place approximately three to four months after they had completed the program.

Four coaches (3 male, 1 female) were interviewed online to explore their experiences of delivering Aussie-FIT, their perceptions of what worked well and what did not, and to seek

suggestions for changes to future programs (Coach Interview Manual – Online Supplement 2). Interviews lasted on average 59 minutes (range 49 – 68 minutes). Focus groups and individual interviews used a standard script and were conducted by a male researcher (CD) who had not been involved in any aspect of intervention delivery, evaluation, or data collection.

Coach interviews and participant focus groups were recorded, transcribed and analysed using principles of reflexive thematic analysis (Braun & Clarke, 2019). Five authors (CD, EQ, DK, CMG, CTN) discussed, developed and agreed a series of semantic codes to label the data, driven in part by the aims of the process evaluation. These included expectations of Aussie-FIT, experiences of taking part, Aussie-FIT content, eating and drinking, PA, weight, previous experiences of weight loss programs, and social influences on their weight loss related thoughts and behaviours. Three researchers (CD, EQ, DK) read the full transcripts and listened to the audio recordings and subsequently, coded the transcripts to these semantic codes. One researcher (EQ) generated latent themes that represented meaning from across the data set relevant to the goals of this paper, and discussed these with CTN who played the role of a ‘critical friend’ and sounding board for exploration, reflection, and consideration of differing interpretations or explanations (Smith & McGannon, 2018). Themes were reviewed and refined to ensure that they represented shared meaning of central concepts. Themes were named, and an analytic narrative using data extracts was produced and contextualised within the existing literature (Braun & Clarke, 2019).

Program attendance and attrition

Coaches were asked to record session attendance using a register. The research team also monitored attrition by recording dropouts with dates and reasons for dropout when provided. The coaches were asked to contact participants who missed a session to attempt to re-engage them; men (n = 12) who dropped out during the Aussie-FIT program were invited to participate in structured telephone interviews to examine their reasons for dropping out.

Aussie-FIT session recordings

We explored the feasibility of coaches applying SDT principles when delivering the Aussie-FIT program via coding applied to the audio recordings of at least one session (out of 12 training sessions delivered by each coach) delivered by each of the six coaches (two sessions were included from 4 coaches, three sessions from 1 coach and one session from the 6th coach). The sessions were selected for recording to capture content across all 12 sessions. We used the Need-Relevant Instructor Behaviour Scale (Quested et al., 2018b) to code the frequency and intensity of ‘need supportive’, ‘indifferent’ and ‘thwarting’ communication/communication styles used by the coaches during session delivery. The tool includes 18 items which describe motivationally relevant instructor or coach behaviours. Aligned with the definitions underpinning the tool, we considered motivationally relevant behaviours to be the things the coaches may do that would have the potential to support, thwart or be indifferent towards the basic needs of the participating men (Quested et al., 2018b). Coding periods ranged from 20 to 97 minutes (mean = 65.83, SD = 22.29). In most cases, the full session was not recorded, as coaches preferred not to wear the recorder during the PA part of the sessions.

Participant surveys

Participants were asked to complete a brief questionnaire at the end of completing the three months intervention, adapted from Hancock et al (2015) on their views of the program. Eleven items explored their perceptions of the Aussie-FIT program acceptability, rated on the 1-7 scale (*strongly disagree – strongly agree*), and inviting them to suggest improvements, via open ended questions. Participants also indicated how helpful they found each of the Aussie-FIT program activities, in terms of making changes to their own behaviours, rating 24 items on a scale ranging from 1 to 3 (1 – *not helpful*, 2 – *quite helpful*, 3 – *very helpful*; 4 – N/A – *I chose not to do this*; 5 – N/A – *I do not remember this*; 6 – N/A – *missed this session*). Means and

medians are reported where appropriate, plus frequencies and percentages of participant responses to each survey item; open ended survey comments were anonymised.

Results and Discussion

The results are structured around the four aims of this paper, and findings from all data sources are integrated throughout to add depth, perspective, and triangulation of the findings reported. Pseudonyms are used throughout, and participants are identified by the club at which they attended the program (1 or 2) and the focus group they participated in (A-F). Five themes that were related to the aims of this paper are presented in the relevant sections. Ninety-three (72%) participants completed the post-program evaluation survey one week after completing the 12-week Aussie-FIT program, either at study measurement sessions or online.

1. Feasibility of uptake, and attrition

The recruitment strategy (mainly through participating AFL clubs' social media platforms and newsletters, Quested et al, 2018a) was highly effective; the program was quickly over-subscribed; 426 men expressed willingness to take part within 3 days of first advertising at each club. These men were assessed for eligibility; 296 men were ineligible: 113 did not meet at least one of the inclusion criteria: 10 were too young, 98 self-reported that they were below the BMI cut-off for inclusion in the study i.e., BMI below 28, 20 were already undertaking a structured weight loss program elsewhere; 183 were not offered places due to limited capacity (the 130 places were allocated on the basis of first come, first served, see Kwasnicka et al., 2020, Figure 1. CONSORT flow diagram for the Aussie-FIT pilot trial). The response rate to the Aussie-FIT program adds further support to challenge the assumption that men do not want to engage in programs to lose weight and change health behaviours (Hunt et al., 2020). In contrast, recent UK and US based men's weight management studies struggled to meet recruitment targets (Griffin et al., 2019; Rounds & Harvey, 2019).

We were unable to assess overall program attendance as coaches did not regularly complete participant registers. Taking attendance at the post-intervention measurement session as a proxy for program completion, 97 participants, approximately 75%, completed the program. Interviews and the focus groups revealed that participant attendance was variable from week to week, with a core group of men demonstrating commitment throughout. Coach Martin commented:

“There was obviously the 10-11 guys were there at the end, they never missed a session. They were there the entire time.”

None of the 33 participants who did not attend post-intervention measurements agreed to participate in the structured interviews to explore their reasons for withdrawal. Of the 33 men who dropped out, 12 men provided reasons via email, citing factors such as job changes (n=2), relocation to other cities (n=7), and health issues (n=3) as the key reason for program discontinuation. There were no significant differences in any baseline characteristics of the participants who dropped out compared to those who completed the study.

2. Feasibility of intervention delivery in the AFL context in Australia

Theme 1: Location, location, location. The AFL club setting was important in some men’s decision to attend the program (“*Vital, it was important*”, James, 2B), but not for everybody at the outset (“*I actually didn’t care less but I have to say I ended up being quite impressed with the fact that it was down here*”, Todd, 1E). These findings were supported by the open-ended survey responses. For most men, the association with the AFL (M = 5.39, Median = 6), and the AFL facility location (M = 5.22, Median = 5) were important (on a scale 1-7 strongly disagree – strongly agree, Table 1). These results support the FFIT study findings that for some men the professional sports club setting can act as a hook for initial engagement (Hunt et al., 2013). For men less interested in the setting at the outset (e.g., Todd), the impressive setting may become more important as the program continues. These findings show promise for association with a

sports team to be used to prompt initial and continuing engagement in health behaviour change programs in Australia, as has been successful in other countries and sport settings (Hunt et al., 2020). Coach Amy explained:

“Having that link to the football club is also that common factor that really bonded the group straight away. So even if you got nothing else to talk about with these guys, you could talk about Club A with them and the same with each other, so that was really fantastic”.

The men’s views echoed this perspective:

Des: I think [the football club] was a good ice breaker at the start.

Scott: Yeah, that’s what it was.

Des: We’re all into CLUB A. So that gave us opening conversation, if you like, where we all start talking about CLUB A and that sort of stuff, and that got us to know each other and from there, it just moved into more personal and friendly sort of stuff. (1E)

Ensuring that locations are both congruent with masculine identities and convenient has previously been highlighted as important when attempting to attract men to health interventions (Archibald et al., 2015; Hunt et al., 2013). However, there are only two Perth-based AFL clubs who are part of the 18 professional teams in total in the national league. Some participants reported travelling long distances from outside Perth, as a potential barrier to attendance. Participant Adrian saw benefit in a scenario where participants lived close to each other to increase interaction outside of the weekly sessions and therefore increase engagement:

“So I don't run into you at the shops and go, “Hey, how are you going?” So one of the things I talked to the guys about was some way of adapting this to the local footy club, or that kind of thing, so working with the local council or whatever, so that you are, you’re running into each other where you go, “OK, Saturday morning we're having a session

08:00, everyone is invited down.” At the moment, getting in here, everyone here once a week was hard enough” (Adrian, 2B).

A notable indicator of success of the FFIT programs in Scotland has been the continued interaction between many participants at the end of the program. Examples of activities to continue interaction include regular activities such as playing football, on-going FFIT-style sessions, as well as social and fund raising events (Hunt et al., 2020). In summary, the limited number of AFL clubs in WA and throughout Australia, coupled with the vast geographical distribution of the Australian population highlights the need for alternative delivery models. This contextual distinction between Scotland and Australia is worthy of further consideration if FFIT-style programs are to be scaled out in Australia, or other countries where the population is widely spread or in locations where access to professional stadia is limited (Figure 1). Obesity rates are significantly higher in many rural areas in the state, in comparison to urban areas (Australian Institute of Health and Welfare, 2018). Thus, the urban-based sample of men recruited in this study, may not be representative of the burden of disease attributable to obesity within Western Australia (Department of Health, 2017). Sporting clubs in regional Australia (e.g., local town football club) can act as a hub for social interaction, in communities where opportunities for social interaction are otherwise limited. Research is required to determine whether lower division AFL clubs or local sporting clubs, can be used effectively as settings to engage men as effectively as the AFL team context.

Please insert Figure 1 here

3. Acceptability to participants and coaches in Australia

Theme 2: A fun, worthwhile, footy-focused experience. Overall, coaches were very positive about their experience of delivering the program. They described feelings of enjoyment, “*I actually really, really enjoyed it. For me, personally, it was just a fun experience*” (Coach

Martin), valued supporting the men's achievements, and recognised training and delivery as an opportunity for professional development.

Having the program delivered by coaches who were not all employed at the football clubs differentiated Aussie-FIT from FFIT and similar programs. There was no evidence that this weakened feelings of connection to the club:

Adrian: I thought it was brilliant. I thought the two coaches we had were great. Just from their experiences, and they just talked about things that we hadn't considered before like the way the guys [professional players] trained and was down to every last measurement and that kind of thing. But I think that gave it a lot of credence, what they were saying was important. (2B).

As this extract shows, the participants were positive about the quality of the coaches, their level of commitment and their integration of football knowledge within the sessions. It was apparent that the men appreciated having coaches who were not only well versed in football knowledge, but were also committed to developing relatedness with the men:

"I think it made us feel as though we were part of it. So that was a good thing... I thought he was exceptionally good and also just things like the Wednesday training. He came out and did some Sunday walks with us and stuff like that, that people did as an off the cuff. I don't know if he was meant to do that but he just showed genuine interest, so I thought he showed that he cared and it probably had an impact from that perspective"
(Scott, 1E)

Among survey completers (n=93), opinions about the program were very positive (mean above 6 on most program aspects scale 1-7 strongly disagree - strongly agree, Table 1).

Specifically, mean scores were above six in agreement with the program being: a worthwhile investment of time, beneficial, enjoyable, helpful to prompting feeling confident and sufficiently prepared to improve eating and to be regularly physically active. Scores of 6 and higher also

indicated it was important that this program was delivered in association with the football club and at the club facility, and that it was a male only program. In the open-ended survey responses, the men commented on several aspects of the program that they found beneficial:

“I loved it. [...] the instructors were really well trained and educated and had great credibility. I loved the food diary and the whole book - which I followed precisely for 12 weeks. I will keep looking at that book for life”.

These findings were corroborated within the focus groups, where men used phrases like “fun”, “brilliant”, “loved it” to describe their experience of the program. In the focus group discussion, John commented,

“[The program] can consolidate a lot of the things that I knew I had to do and just given me the skills, tools and knowledge and social support base to enable me to do that. And I wouldn't be exaggerating if I say it was life-changing. It was life-changing and I highly recommend it. I tell everyone about it and I have a couple of mates who have done it. It's highly beneficial and thanks for the opportunity. It's been sensational” (John, 1A).

The program elements with the highest scores for being helpful for behaviour change (Table 2) were: using Wi-Fi connected activity monitor (81%); learning about food labels (73%); and setting PA goals (71%). The elements with the highest percentage of men reporting them as least helpful for behaviour change were: cutting down on alcohol (13%, some reported in the open-ended comments that they did not drink alcohol) and using the Aussie-FIT Facebook group (12% found it unhelpful; and further 12% men chose not to join). Some men noted reasons in the open-ended comments section, including that they were not regular Facebook users, that they had bad experiences with social media in the past or that they preferred not to use Facebook for this program. Despite this minority, Coach Amy reported that the Facebook groups were well utilised, *“we definitely used our Facebook groups. The guys were on [Facebook] at least weekly, but there were a lot of conversations about – I've seen this, I found this at the Footy, there's a*

healthy sandwich shop at the new Oval". In total, 73 men (78%) reported that the balance between the nutrition and PA classroom sessions and the practical PA activities within each weekly session was appropriate and 81 men (87%) reported that the physical activities in all sessions were suitable for their abilities. Among men who responded that the physical activities were not appropriate (13%), two added comments to clarify that they had injuries or health issues that made physical activities challenging for them, and the other men indicated that they would like to be pushed more by receiving more intensive, longer and/or more frequent training.

The Aussie-FIT program was offered free of charge. In the open-ended survey questions the men were asked to indicate, retrospectively, how much they would be willing to pay for the 12-week Aussie-FIT program in AUD; the average response was \$142.15 (SD=113.09), range 0 – 600, median 120. One of the men justified his answer:

"The reason I feel the \$0 cost for the course is I probably wouldn't have enquired or joined if there was a cost as I was committing so much time to travel each week to attend. I'm not really a cheapskate! Overall, for me the course was worth every minute. I lost 3.7 kilos, and I'm hoping to continue well after the end, with food focus and continual exercising."

4. Mechanisms of behaviour change

Theme 3: Internalisation of motivation. The Aussie-FIT program included new content in coach training and program delivery that drew from SDT (Ryan & Deci, 2017) with the goal of promoting the men's autonomous motivation for weight management behaviours. The coaches found the approach taken to understand and teach the motivation concepts to be accessible for both coaches and men:

"It was – the content was relevant and quite easy to coach. Motivation is always a pretty tough one to teach and coach, but I think all the structure was there to teach them well."
(Coach Peter).

The coaches spoke favourably about how training in motivation informed the delivery style:

“Quite a lot of the [coach training] session was set aside for that, knowing that the motivation is basically one of the core pillars of the program. Without it, you can teach all of the well-being stuff but it’s not gonna be maintained long term.” (Coach Martin).

For Coach Amy, the training helped her to understand how to adapt her usual delivery style to better support the men’s feelings of competence and relatedness:

“We were talking about how to create, so your own motivational atmosphere ... which actually was quite helpful for me. I think as a female going into a blokes’ program, and I think being a PE teacher as well, my tendencies towards that kind of ‘piss take’ behaviour and things like that, so it was something I had to really cut back on you know the sarcasm and things like that, and that actually made me realise that, “Okay, we’re not going to have a laugh at the guy that’s going a bit slower, we’re not going to get stuck into him”. (Coach Amy).

Coach Martin described that the activities embedded in the program helped to get the concepts across effectively and that the men found this approach useful. Coach Peter described how the ‘red and green motivation’ tool was helpful for the men to reflect on the shifts they observed in their own motivation.

“I think that’s a good way of sort of breaking it down, allowing people to get insight into looking back at their motivations. It’s something I referred back to a fair bit throughout the whole program and there was – definitely throughout the whole program, we could look back and see that maybe red motivations were what maybe got them there initially, but then however trying to evolve that into more their motivation to sustain it, actually make it a part of lifestyle going forward” (Coach Peter).

The participants' reflections also indicated that the 'red and green motivation' approach was useful to give them the understanding of, and vernacular to explain, the shifts in motivation that they observed in themselves:

"That was brought up in the first day, the idea of positive and negative, being red to green, and the idea was instead of doing it for the wife, the idea was at the end of the course was you came to do it because it was fun and you wanted to do it, and that's how it feels for us, it was fun" (Luke, 1C).

The coaches' application of motivationally supportive strategies was evidenced in the codings of 12 recorded Aussie-FIT sessions; use of need supportive strategies were more prevalent than need thwarting or need indifferent strategies (Table 3, Online Supplement 5). The highest mean for use of need thwarting strategies was "*showing disregard or rejection for men's feelings, preferences, opinions and feedback*". This strategy was only observed three times, and only in sessions delivered by two of the coaches. The most prevalent need indifferent strategy (observed 63 times in 9 coaches' sessions) was "*talking in ways that are motivationally empty*", characterised by using phrases that are encouraging, but lack qualities that would support participants' feelings of autonomy, competence or relatedness (e.g., "*go, go, go*"). Although need indifferent strategies are not necessarily maladaptive, they represent "*missed opportunities*" to have offered a further boost to need satisfaction.

The most frequently used need supportive strategy by coaches was use of inclusive language. This refers to using words and phrases that help people to feel a sense of freewill, consulted (asked, rather than told), important, respected and capable. Examples include using a questioning style to phrase instructions (e.g., '*shall we..?*', '*would you like to..?*') and using words that open up the possibility of choice rather than command. For example, '*we could*', '*you might*', '*perhaps*'. This strategy was observed between 2 and 25 times in the sessions coded. The need supportive strategy used least frequently was "*acknowledging the men's feelings and*

responding appropriately” which was used between 0 and 5 times in the sessions coded.

Providing specific and constructive feedback was the second least used strategy.

Theme 4: Small sustainable changes in diet and physical activity. Some men described that the behaviours promoted in the program had become integrated with their values and way of life. This was typically associated with descriptors of behavioural intentions to sustain behavioural changes beyond the 12-week program: *“For me, it’s not the program now, this is my life. So, this is how I live now. I don’t plan on going back and doing crazy things with food and all that kind of stuff”* (Adrian, 2B).

The focus groups indicated that the men recognised that the program was effective in supporting the development of habits to help them sustain newly acquired behaviours beyond the program.

Ricky: Habit. As I’ve said, it’s become a habit rather than just – rather than blowing in the wind. It’s ingrained over that time. I didn’t expect it. I was about week ten, even when I came over East [Australia], I suddenly realised that the program does what it’s supposed to do. You didn’t realise it until near the end you sort of go, “Hang on, I have changed the way I am eating, drinking and that.”

Stuart: Just the right mindset, I suppose. (1C).

Participants recognised that the program centred on lifestyle changes to develop sustainable changes to endure beyond the 12-week program:

Ralph: So yeah, and that’s why the whole program that was aimed at – it wasn’t a 12-week program that you go there and you’ve achieved it in 12 weeks and you’re finished. It was a 12-week education that this is what you can do on your own. I think that’s why it was so good because it was like stuff that we could take away and just establish habits, like we even talked about eating, just making habit around healthy eating habits. So it wasn’t like eat this for 12 weeks and you’ll be fixed.

The men had autonomy over the behaviours they change, goals they set etc., which was valued.

Derek: Yeah. I guess it's a key to it, isn't it, it's education. There are no quick fixes when you talk about what you weigh, it's something that you do for life and it's a lifestyle change and good habits. I think even if you take away a small amount of the sessions, you're in a better place. (2D)

These findings are consistent with evidence that habit formation is necessary for maintained health behaviours that become automatic responses to contextual cues (Gardner & Rebar, 2019). Our participants were assessed 3 and 6 months after baseline. Studies examining within person processes of habit formation have demonstrated that this is sufficient time to form health habits (Keller et al., 2021; Lally, et al., 2010). Coach Mark emphasised education to support habit development as more important in the long term than the football focus:

“I actually think going back to the habits and the motivation, so getting those healthy habits, having the motivation to I guess make them a habit, and something that you just fall into. I think that was the biggest key. A lot of the footy aspect I think, for me, was something that gets them in the door and it's something that might inspire them to come back next week. And one aspect of the session is that hook to have them keep coming. It's the habits around walking and step counts and being active in daily life because the other thing that kept coming up was the guys want something that can fit into their daily life, work around work commitments, family commitments, and that also goes back to that balance of the whole program. It's about balancing life, plus physical activity, plus a healthy diet, plus a bit of a blowout every so often for a celebration or things like that”
(Coach Mark).

The additional focus on action and coping planning in Aussie-FIT was intended to support the men to address barriers to goal progress:

Ralph: But by the end of it ... you've got really no excuse because they've closed off every loophole really. Even when you do the thing or what barriers can you foresee, what can

you do to overcome these barriers and by the time you fill this out, you've got no excuse so I can do it. So that was really something for me.

Derek: Breaking down the goals, you know, into little chunks always helps.

Freddie: And definitely like you sort of said it, I envisage me doing whatever the goal was, so it was just made that, "Okay, this week I'm gonna do that," 'cos it took out every excuse you could think. It was like, "I will do this. How I will do this?" (2D)

Theme 5: Connecting with other "men like us"

"Cos it's not only about me, it's about my fellow brothers here, we're all likeminded, so we all need encouragement" (Gareth, 1F)

The importance of support from a group of similar men was as pronounced in Aussie-FIT as in previous FFIT programs (Hunt et al., 2013). According to participant Scott, the combined effect of the football club setting and shared identity of the participants was a big draw to attending the program, *"I think it was just the fact that it was maybe here and it was aimed at men like us, I think"* (Scott, 1E). This theme was also reflected both in men's experiences during program participation (*"I think we pretty much all are on the same page. We're all starting off heavier than we wanted to be, less motivated than we wanted to be, maybe not eating well, drinking a bit, and probably describes most of us. Then slowly over time, we tried to encourage each other and try to talk ourselves in it to improving most of that, if we could"* Des, 1E), and when describing interactions beyond the 12 weekly sessions:

Des: I think you need support. You can't do it by yourself. I think you need other support from your friends and your family or from your fellow classmates. Keep in touch and keep each other going. I think it would be easy to slip back, so find some sort of support, some reason, somebody to help you to keep going. (1E).

The perceived need for organised on-going support prompted one participant to organise his own alumni group: *"For me, there is a void in the end, I thought, "I don't wanna to stop this," and I*

did, I did feel a bit of a void, and that's why we started our own things. We want to keep it going 'cos we knew it was working..." (John, 1B). However, John reflected that buy-in to his alumni program was limited: "blokes were less committed because it wasn't a XXX University doctors' thing it was a group of blokes getting together" (John, 1B)".

A new feature of Aussie-FIT not emphasised in the original FFIT program (Gray et al., 2013), and added to reflect the change in social media popularity and use, was the set-up of closed (private) Facebook groups that participants were encouraged to join. As Coach Amy described, the social media was useful for men to help them feel connected, share ideas and support and encourage each other:

" You know, even organising dinners and things like that, they're organising walking groups and they were sharing different activities that they found, different recipes and things that they found. So for us, it was the Facebook group and then the Fitbit app where they could send challenges and things to each other as well and I know a lot of them are still connected through that" (Coach Amy).

The Facebook groups were described by some men as useful tools to stay connected post-program: *"This was something that we talked about in our group carrying on talking to each other over the Facebook app or just, just keeping in contact and talking once a week, saying, "How are your steps going?" and catching up once a week or once a fortnight, once a month, whatever it might be to keep our own motivation." (Colin, 1F)*

Coach Peter saw the use of social media as an opportunity to help the men to take ownership of the program:

"Yeah, definitely the Facebook group was beneficial. It was a good way for the guys to sort of start connecting and start to sort of really drive their own program and I could assist with that a little bit, but it was good to see they could start to take some ownership and start to drive it themselves, which did happen." (Coach Peter).

These findings differ to some previous studies, in which men have not used online forum facilities. For example, in the process evaluation of the online SHED-IT program (Morgan et al., 2011), men commented that they were not interested in discussing weight loss with other men online. It is possible therefore that a face-to-face delivery format is necessary first to generate rapport that can be transferred to the digital support group (Dahl et al., 2016). The increased integration of social media into the daily lives of men in this age group than was the case at the time of previous studies likely accounts for some of these differences.

Theme 6: Competition – a double-edged sword? The FFIT program used pedometers to support men in monitoring their progress towards their graduated physical activity goals, whereas Aussie-FIT participants received waist-worn Wi-Fi connected activity monitors. The Wi-Fi connected monitor offered the additional possibility to synchronise data with other devices, view progress, and interact with others via the online portal. The men’s enthusiasm for using a Wi-Fi connected monitor to record steps echoes findings from the FFIT study, in which men “*verged on evangelical*” when discussing the benefits of the device (Hunt et al, 2013). Although not an intended design feature of Aussie-FIT, it became apparent that via the facility to view their own step count on the platform, men were also able to observe the step counts of other men in the group. In the focus groups and coach interviews this generated considerable discussion around inter- and intra-group competition. Coaches described this as developing a healthy team spirit to compete against the other club:

“The biggest thing that – my group was actually going online with the Fitbit and seeing the Club B groups beating them in their steps each week and that was kind of the moment where it was, “Right, we’re not going to let those guys win.” So that’s when my group really stepped it up, and just a funny thing that that’s what would do it but that’s when they really started to get on their Facebook group and you know, “Let’s not let those bastards

win,” and they’re really challenging each other, so I found they needed that little bit of healthy competition and something to spur them on to get them going” (Coach Amy).

However, intra-group comparison and inter-group accountability via the platform appeared to create more controlled motives to increase steps in some men, which is counter to the intended promotion of autonomous motivation:

*“Well you had your groups on the Fitbit, so someone came in and said, “I’ve just looked at the thing,” and I said, “The [other club] are ****ing first and second and we’re in third.” We’ve got to do more steps. So next minute, the next week, everyone’s steps has went through the roof and we just continued, ‘cos we weren’t gonna let those bastards be number one [laughter]. That was the only competition” (Alf, 1F).*

Despite some apparent surface motivational benefits described by men and coaches, the inclusion of competition components should be considered with caution. The use of competition as a ‘motivator’ has the potential, when not managed effectively, to undermine internalisation of motivation and could intensify ego-involvement and inevitably, some men will become the ‘losers’. When men are ego-involved (i.e., feel competent based on comparisons to others rather than self-improvement), risks of drop out are greater (Roberts & Treasure, 2012):

After the first week, I thought of quitting because I’ve... got depressed and anxious about – even the steps that I was doing and the amount of work I was doing and it wasn’t enough. I was comparing myself to Joey and Tom and Dave and... everybody else and, mentally, it got to me. I was like ten seconds from walking away but once I was told by my boss and everybody else that I’m not competing with them I’m working alongside them. I’m competing against myself. That’s changed it. But at that time, I could’ve pulled the pin”. (Colin, 1F).

In a recent qualitative study of men participating in a sport-based weight loss program, some men perceived there to be risks of competition going “too far”, which could lead to negative

consequences (Budden et al., 2020). Given the inherent tendency for some individuals to compare themselves with others or crave competition, programs such as Aussie-FIT need to focus on equipping coaches to effectively manage the motivational climate to ensure *all* men feel competent. Additionally, comparisons may take multiple dimensions, men can compare weight loss progress but also changes in diet, steps, PA, and other behavioural domains. Some authors emphasize the benefits of encouraging interpersonal appreciation (ten Hoor et al., 2016) of person specific strengths, e.g., appreciating that some men improved weight but others may have become stronger, fitter, or improved their self-control. Further research is warranted to explore the degree to which coaches could promote interpersonal appreciation whilst still maintaining an adaptive motivational environment. Coach Amy described there being a delicate, and challenging, balance to strike between celebrating achievements and promoting comparison:

“I think for me that was a difficult aspect because you think there was that balance between healthy competition and celebrating those achievements and not wanting to – I felt like it was drilled into my head at the start, we’re not here to compete and everyone goes at their own pace. ...one guy in my group, in particular wanted to stand up and everyone say what they’ve done this week at the start and have one trophy at the start where we award to the best achievement, and I know it’s fantastic. But when we’re looking back at the initial training and seeing, “well okay what about those guys who haven’t achieved anything this week”, I found that a difficult balance, how to celebrate those guys that are doing well potentially lift those other guys with them without making them feel bad, so that was a fine balance.” (Coach Amy).

Strengths and Limitations

Strengths of this process evaluation included the application of mixed methods to explore why men participated in the Aussie-FIT program, perceptions of and experiences during the program, and overall satisfaction with the program. The inclusion of interviews with coaches

who delivered the program as well as with participants added richness and perspective to the analysis. Limitations of the study included lack of documentation by coaches on participant attendance. The findings only represent the views of completers; despite invitations to do so, we were unable engage dropouts in interviews to explore their experiences. The full sessions were not recorded, as coaches preferred not to wear the recorder during the PA part of the sessions as it was not practical; lack of the PA session recording is a potential study limitation as we were unable to determine the degree to which the coaches adapted their delivery style to support participants' self-determined motivation when being active. In this study, it was not possible to evaluate the potential additive effects of new content in Aussie-FIT, not included in the FFIT intervention. The participant and coaches' positive references to specific aspects of that content (e.g., motivation content in the program and coach training) suggest it would be of value to determine whether this additional content is not only appreciated by coaches and participants, but also impacts effectiveness of the intervention.

Conclusions

This process evaluation aimed to determine recruitment and intervention delivery feasibility and explore acceptability and mechanisms of impact of the Aussie-FIT program. The recruitment method (i.e., publicity via professional AFL teams) was highly effective in engaging men in Western Australia with a BMI ≥ 28 in a weight loss program. Regarding context, the lack of population density in many parts of Western Australia and scarcity of professional clubs contributed to men traveling long journeys to attend and could be a potential limitation for program expansion using the existing format. This highlights the need to evaluate whether deliveries in other localities, for example using local football or other sports settings, can be similarly effective as a 'hook' to reach men in more rural areas of Western Australia, if the intervention proves scalable and sustainable. The AFL-focused nature of the intervention was also highly appealing and this approach could be emphasised as an engagement 'hook' when

delivering Aussie-FIT in other regions that lack a local team with a high fan base. The inclusion of additional content related to motivation, incorporating behaviour change techniques that emphasised small and sustainable changes, and the peer support of other-like minded men, were mechanisms to explain how the intervention may have produced the positive effects previously reported (Kwasnicka et al., 2020). In summary, our findings support previous results from FFIT programs that indicate implementing gender-sensitised weight loss and behaviour change programs through the professional clubs is feasible, acceptable, and poses a promising avenue to adapt and implement elsewhere in Australia to combat obesity.

References

- Aarons, G. A., Sklar, M., Mustanski, B., Benbow, N., & Brown, C. H. (2017). “Scaling-out” evidence-based interventions to new populations or new health care delivery systems. *Implementation Science, 12*(1), 111. <https://doi.org/10.1186/s13012-017-0640-6>
- Archibald, D., Douglas, F., Hoddinott, P., Van Teijlingen, E., Stewart, F., Robertson, C., Boyers, D., & Avenell, A. (2015). A qualitative evidence synthesis on the management of male obesity. *BMJ Open, 5*(10), e008372. <http://dx.doi.org/10.1136/bmjopen-2015-008372>
- Australian Institute of Health and Welfare. (2018). *A picture of overweight and obesity in Australia*. <https://www.aihw.gov.au/reports/overweight-obesity/a-picture-of-overweight-and-obesity-in-australia/contents/table-of-contents>
- Bhavsar, N., Ntoumanis, N., Quested, E., Gucciardi, D. F., Thøgersen-Ntoumani, C., Ryan, R. M., Reeve, J., Sarrazin, P., & Bartholomew, K. J. (2019). Conceptualizing and testing a new tripartite measure of coach interpersonal behaviors. *Psychology of Sport and Exercise, 44*, 107–120. <https://doi.org/10.1016/j.psychsport.2019.05.006>
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health, 11*(4), 589–597. <https://doi.org/10.1080/2159676X.2019.1628806>

- Budden, T., Dimmock, J. A., Smith, B., Beauchamp, M., Rosenberg, M., & Jackson, B. (2020). Overweight and obese men's experiences in a sport-based weight loss intervention for men. *Psychology of Sport and Exercise*, 101750.
<https://doi.org/10.1016/j.psychsport.2020.101750>
- Dahl, A. A., Hales, S. B., & Turner-McGrievy, G. M. (2016). Integrating social media into weight loss interventions. *Current Opinion in Psychology*, 9, 11–15.
<https://doi.org/10.1016/j.copsyc.2015.09.018>
- Department of Health, W. A. (2017). *Chronic Disease Prevention Directorate. Western Australian Health Promotion Strategic Framework 2017–2021. A five-year plan to reduce preventable chronic disease and injury in our communities.*
- Gardner, B., & Rebar, A. L. (2019). Habit Formation and Behavior Change. In B. Gardner & A. L. Rebar, *Oxford Research Encyclopedia of Psychology*. Oxford University Press.
<https://doi.org/10.1093/acrefore/9780190236557.013.129>
- Gray, C. M., Hunt, K., Mutrie, N., Anderson, A. S., Leishman, J., Dalgarno, L., & Wyke, S. (2013). Football Fans in Training: The development and optimization of an intervention delivered through professional sports clubs to help men lose weight, become more active and adopt healthier eating habits. *BMC Public Health*, 13(1).
<https://doi.org/10.1186/1471-2458-13-232>
- Griffin, T., Sun, Y., Sidhu, M., Adab, P., Burgess, A., Collins, C., Daley, A., Entwistle, A., Frew, E., & Hardy, P. (2019). Healthy Dads, Healthy Kids UK, a weight management programme for fathers: Feasibility RCT. *BMJ Open*, 9(12).
<http://dx.doi.org/10.1136/bmjopen-2019-033534>
- Hancox, J. E., Quested, E., Thøgersen-Ntoumani, C., & Ntoumanis, N. (2015). An intervention to train group exercise class instructors to adopt a motivationally adaptive

- communication style: A quasi-experimental study protocol. *Health Psychology and Behavioral Medicine*, 3(1), 190–203. <https://doi.org/10.1080/21642850.2015.1074075>
- Hunt, K., McCann, C., Gray, C. M., Mutrie, N., & Wyke, S. (2013). “You’ve got to walk before you run”: Positive evaluations of a walking program as part of a gender-sensitized, weight-management program delivered to men through professional football clubs. *Health Psychology*, 32(1), 57. <https://doi.org/10.1037/a0029537>
- Hunt, K., Wyke, S., Bunn, C., Donnachie, C., Reid, N., & Gray, C. M. (2020). Scale-up and scale-out of a gender-sensitized weight management and healthy living program delivered to overweight men via professional sports clubs: The wider implementation of Football Fans in Training (FFIT). *International Journal of Environmental Research and Public Health*, 17(2), 584. <https://doi.org/10.3390/ijerph17020584>
- Jensen, M. D., Ryan, D. H., Apovian, C. M., Ard, J. D., Comuzzie, A. G., Donato, K. A., Hu, F. B., Hubbard, V. S., Jakicic, J. M., & Kushner, R. F. (2014). 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society. *Journal of the American College of Cardiology*, 63(25 Part B), 2985–3023.
- Keller, J., Kwasnicka, D., Klaiber, P., Sichert, L., Lally, P., & Fleig, L. Habit formation following routine-based versus time-based cue planning: A randomized controlled trial. *British Journal of Health Psychology*.
- Koorts, H., Eakin, E., Estabrooks, P., Timperio, A., Salmon, J., & Bauman, A. (2018). Implementation and scale up of population physical activity interventions for clinical and community settings: The PRACTIS guide. *International Journal of Behavioral Nutrition and Physical Activity*, 15(1), 51. <https://doi.org/10.1186/s12966-018-0678-0>

- Kwasnicka, D., Dombrowski, S. U., White, M., & Sniehotta, F. (2016). Theoretical explanations for maintenance of behaviour change: A systematic review of behaviour theories. *Health Psychology Review, 10*(3), 277–296. <https://doi.org/10.1080/17437199.2016.1151372>
- Kwasnicka, D., Ntoumanis, N., Hunt, K., Gray, C. M., Newton, R. U., Gucciardi, D. F., Thøgersen-Ntoumani, C., Olson, J. L., McVeigh, J., Kerr, D. A., Wyke, S., Morgan, P. J., Robinson, S., Makate, M., & Quested, E. (2020). A gender-sensitised weight-loss and healthy living program for men with overweight and obesity in Australian Football League settings (Aussie-FIT): A pilot randomised controlled trial. *PLOS Medicine, 17*(8), e1003136. <https://doi.org/10.1371/journal.pmed.1003136>
- Lally, P., Van Jaarsveld, C. H., Potts, H. W., & Wardle, J. (2010). How are habits formed: Modelling habit formation in the real world. *European Journal of Social Psychology, 40*, 998–1009. <https://doi.org/10.1002/ejsp.674>
- Michie, S., Richardson, M., Johnston, M., Abraham, C., Francis, J., Hardeman, W., Eccles, M. P., Cane, J., & Wood, C. E. (2013). The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: Building an international consensus for the reporting of behavior change interventions. *Annals of Behavioral Medicine, 46*(1), 81–95. <https://doi.org/10.1007/s12160-013-9486-6>
- Morgan, P. J., Warren, J. M., Lubans, D. R., Collins, C. E., & Callister, R. (2011). Engaging men in weight loss: Experiences of men who participated in the male only SHED-IT pilot study. *Obesity Research & Clinical Practice, 5*(3), e239–e248. <https://doi.org/10.1016/j.orcp.2011.03.002>
- Ntoumanis, N., Ng, J. Y. Y., Prestwich, A., Quested, E., Hancox, J., Thøgersen-Ntoumani, C., Deci, E., Ryan, R., Lonsdale, C., & Williams, G. (2020). A Meta-Analysis of Self-Determination Theory-Informed Intervention Studies in the Health Domain: Effects on

Motivation, Health Behavior, Physical, and Psychological Health. *Health Psychology Review*. <https://doi.org/10.1080/17437199.2020.1718529>

Ntoumanis, N., Quested, E., Reeve, J., & Cheon, S. H. (2018). Need supportive communication: Implications for motivation in sport, exercise, and physical activity. *Persuasion and Communication in Sport, Exercise, and Physical Activity*, 155–169. <https://doi.org/10.1037/spy0000119>

Quested, E., Kwasnicka, D., Thøgersen-Ntoumani, C., Gucciardi, D. F., Kerr, D. A., Hunt, K., Robinson, S., Morgan, P. J., Newton, R. U., & Gray, C. (2018). Protocol for a gender-sensitised weight loss and healthy living programme for overweight and obese men delivered in Australian football league settings (Aussie-FIT): A feasibility and pilot randomised controlled trial. *BMJ Open*, 8(10), e022663. <https://doi.org/10.1136/bmjopen-2018-022663>

Quested, E., Ntoumanis, N., Stenling, A., Thøgersen-Ntoumani, C., & Hancox, J. E. (2018). The Need-Relevant Instructor Behaviors Scale: Development and Initial Validation. *Journal of Sport and Exercise Psychology*, 40(5), 258–268. <https://doi.org/10.1123/jsep.2018-0043>

Roberts, G. C., & Treasure, D. (2012). *Advances in motivation in sport and exercise*. Human Kinetics.

Robertson, C., Archibald, D., Avenell, A., Douglas, F., Hoddinott, P., Van Teijlingen, E., Boyers, D., Stewart, F., Boachie, C., & Fioratou, E. (2014). Systematic reviews of and integrated report on the quantitative, qualitative and economic evidence base for the management of obesity in men. *Health Technology Assessment (Winchester, England)*, 18(35), v. <https://doi.org/10.3310/hta18350>

Robertson, C., Avenell, A., Stewart, F., Archibald, D., Douglas, F., Hoddinott, P., Van Teijlingen, E., & Boyers, D. (2017). Clinical effectiveness of weight loss and weight

- maintenance interventions for men: A systematic review of men-only randomized controlled trials (the ROMEO project). *American Journal of Men's Health*, 11(4), 1096–1123. <https://doi.org/10.1177/1557988315587550>
- Rounds, T., & Harvey, J. (2019). Enrollment challenges: Recruiting men to weight loss interventions. *American Journal of Men's Health*, 13(1). <https://doi.org/10.1177/1557988319832120>
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Publications.
- Sharp, P., Spence, J. C., Botorff, J. L., Oliffe, J. L., Hunt, K., Vis-Dunbar, M., & Caperchione, C. M. (2020). One small step for man, one giant leap for men's health: A meta-analysis of behaviour change interventions to increase men's physical activity. *British Journal of Sports Medicine*. <http://dx.doi.org/10.1136/bjsports-2019-100912>
- Smith, B., & McGannon, K. R. (2018). Developing rigor in qualitative research: Problems and opportunities within sport and exercise psychology. *International Review of Sport and Exercise Psychology*, 11(1), 101–121. <https://doi.org/10.1080/1750984X.2017.1317357>
- ten Hoor, G. A., Plasqui, G., Ruiter, R. A., Kremers, S. P., Rutten, G. M., Schols, A. M., & Kok, G. (2016). A new direction in psychology and health: resistance exercise training for obese children and adolescents. *Psychology & Health* <https://doi.org/10.1080/08870446.2015.1070158>
- WHO. (2018). *Obesity and overweight*. <https://www.who.int/news-room/factsheets/detail/obesity-and-overweight>
- Young, M. D., Plotnikoff, R. C., Collins, C. E., Callister, R., & Morgan, P. J. (2015). Impact of a male-only weight loss maintenance programme on social-cognitive determinants of physical activity and healthy eating: A randomized controlled trial. *British Journal of Health Psychology*, 20(4), 724–744. <https://doi.org/10.1111/bjhp.12137>

Online Supplement 1

Aussie-FIT Focus Group Topic Guide

1. Introduction

- Welcome
- Aims of the group discussion and expected duration (1 hour) – I want to find out what prompted you to take part in the Aussie-FIT programme, what you thought of the programme at [Club Name], how being involved with it has affected your life (or not), any influences the programme has had on others, including family members and any changes you would like to see made to the programme. This discussion will last about 1 hour.
- I am simply here as a sort of chairperson to make sure that everyone gets a chance to speak. Anything you say is important to me and the other researchers so please don't be afraid of speaking your mind.
- I will audio-record the discussion, and the recordings will be kept for 10 years after the project finishes, but everything you say will be treated in the strictest confidence; all names mentioned will be changed for publication/presentation purposes
- Ask the group to define ground rules, for example: Only one person talks at a time; it is important to hear everyone's ideas and opinions; there are no right or wrong answers – just ideas, experiences and opinions, which are all valuable; important to hear all positive and negative perspectives; assure confidentiality – “what is shared in the room stays in the room”.
- Start by getting the men to introduce themselves and say when they completed what they ate for breakfast (for voice identification).

2. About joining Aussie-FIT

Let's start by thinking back to when you first got involved with Aussie-FIT.

Why did you join the Aussie-FIT program?

- Did you want to lose weight, or change clothes size, appearance, increase your fitness or improve your diet, health and wellbeing?

Have you taken part in other weight management groups in the past?

- For Example, Weight Watchers, lite n easy or other healthy lifestyle or group physical activity/exercise programs?
- When, how often?

What attracted you to this compared to other programs like Weight Watchers or Lite n' Easy?

- What did you think you would be doing on the program for the 12 weeks, based on the club newsletter/Facebook posts etc?
- How important was the AFL club in your decision to take part?

3. Your experience of the Aussie-FIT program

Now let's talk about your experiences of being a participant in Aussie-FIT.

How did you feel about the introduction sessions when you took part in some physical measurements, including weight, waist, BMI and blood pressure?

- What was it like receiving information about these measurements?
- Did you already know what these measures were for you or was any of it surprising?

What did you think about coaches connected with Dockers/Eagles delivering the program?

- What did you feel about their general coaching style/approach with the group?

Was there anything else you would have liked to have been included in the 12 week program? If not mentioned, ask about:

- Continuing contact with the club, coaches or other men in the group

Are there any aspects of the program that you thought were unnecessary? If so, which parts and how could we change them?

What did you think about general attendance over the 12 weeks?

- What do you think kept men coming along?
- Why do you think some men dropped out?

What differences has the Aussie-FIT program made to you and your life, if any? Including, positive or negative impacts. If not mentioned, ask about:

- Weight-loss
- Better eating habits
- Being more active
- Drinking less alcohol
- Having more energy
- Feeling better
- Making new friends
- Injuries or new aches and pains

If you feel the Aussie-FIT program had positive impacts on your life, what was it about the programme that helped you experience these? If not mentioned, ask about:

- The group interaction (and what was it about the group that was important)
- The walking component/Fitbit
- The PA sessions
- The focus on healthy eating
- Setting goals (PA, diet and weight)
- Monitoring behaviour (PA and diet)
- Monitoring weight
- New knowledge (PA and diet)

What sorts of reactions have you had from family and friends about you taking part in Aussie-FIT and making changes to your lifestyle?

4. After Aussie-FIT

Finally, I would like to discuss with you how things have been since you finished the 12 week program.

Now that you have reached the end of the programme – what is next?

- What are your plans to keep any of the changes you have made going forward; meeting up to do what? Doing things with the family or friends?

What do you think will help you keep the changes going?

What challenges do you see?

- How do you think you might deal with those?

Summary

At end of discussion, summarise what has been said and ask men if there is anything else they would like to add.

Online Supplement 2

Aussie-FIT Coach Interview Manual

1. Introduction

- Welcome
- Aims of the interview and expected duration (45-60 mins) – to explore your experience of delivering the Aussie-FIT program to men aged 35-65 so that we can take these into account in optimising the program in future.
- Anything you say is important to me and the other researchers so please don't be afraid of speaking your mind.
- I will audio-record the discussion, and the recordings will be kept for 10 years after the project finishes, but everything you say will be treated in the strictest confidence; all names mentioned will be changed for publication/presentation purposes.
- If there are any questions you do not want to answer, let me know, we can just move on to the next.

2. General

What did you think were the main things that the Aussie-FIT program was trying to achieve?

Can you tell me a bit about the Aussie-FIT program you delivered?

- Which club/group? Date and time? Why were these times chosen?
- How many men were involved?
- What was attendance like over the 12 weeks?

3. Reflections on coach training sessions

First, I want to ask you a bit about the initial training you received. How did you find the initial coach training sessions? (Prompts – were they helpful/not helpful? Was there anything that could have been done differently?)

- How did you find the theoretical content during the coach training sessions, specifically on motivation and behaviour change? (Prompt - what about the components on creating a motivational climate (including, red versus green motivation), understanding of behaviour change techniques (incremental goal setting, planning and habit formation)? What about the parts on developing your own Aussie- FIT delivery style?)

Reflection on program delivery

- Now I would like to ask you about your experience of delivering the program. Overall, how do you feel it went?
- How did you find the program to deliver? (Prompts – were there any specific challenges or problems?)
- How did you find the support you were given to deliver the program? (Prompts – from the EI and Dom/the AFL club/the venue)
- Did you find anything particularly helpful in enabling you to deliver the program? If so, what? (Prompt: looking at the lesson plans in the folders, session materials – which ones did you like/find helpful? What about group involvement during the sessions; Facebook, Fitbit etc; how about the planning and reflection activities/sheets?).
- Was there anything that made the delivery of the programme particularly difficult? (Prompt – age range, more dominant/disruptive personalities, engaging those who were more, different levels of physical abilities/fitness? Limited access to venue facilities)

- How did you feel about dealing with the questions the men asked? (Prompt any difficult topics, any issues you felt you can't address or talk about).

Reflections on program content

- What did you think was good about the program?
- What did you think was not so good about the program? And suggestions for improvement?

- Which parts of the programme did you think were effective in helping the men to lose weight? Why?
- Were there any components of the program that you felt were not useful for helping the men to lose weight? Why? Would you omit them/ change them?
- Which elements of the program did you think were effective in helping the men to increase their PA? (Prompt: the walking component/FitBit, the group exercise sessions, the support from the group/competition etc, goal setting or other activities in the 'classroom' part, etc)
- Were there any components of the program that you felt were not useful for helping the men to increase their PA? Why?

A key focus of Aussie-FIT was helping the men to make long term changes to their lifestyle, not just make changes, or experience weight loss that could not be maintained beyond the 12 weeks. Which parts of the program do you think were particularly helpful in trying to achieve this? Do you think the program was effective in achieving this? Why/why not?

4. Future program deliveries and looking forward

- Are there any changes that you would like to see made to any particular elements of the program? (Prompt – more information, more training/materials, targeting of different men?) Why?
- Would you like to see the club offering any other kinds of health programs to fans? If so, what kinds of programs and for whom (e.g., for women, kids.etc)?

Summary

At end of discussion, summarise what has been said and ask the coach if there is anything else they would like to add.

Online Supplement 3

Table 1*Acceptability of the Aussie-FIT program by men who completed the program (n=93)*

Statements	Mean (median) (scale 1-7)	Frequencies (%)
The Aussie-FIT program was a worthwhile investment of time for me	6.40 (7.00)	1 – 1 (1.1) 2 – 2 (2.2) 3 – 1 (1.1) 4 – 1 (1.1) 5 – 4 (4.3) 6 – 24 (25.8) 7 – 60 (64.5)
The Aussie-FIT program was beneficial for me	6.40 (7.00)	2 – 1 (1.1) 4 – 3 (3.2) 5 – 8 (8.6) 6 – 25 (26.9) 7 – 56 (60.2)
I enjoyed the Aussie-FIT program	6.55 (7.00)	4 – 1 (1.1) 5 – 7 (7.5) 6 – 24 (25.8) 7 – 61 (65.6)
The program helped me to feel confident to use what we learnt to improve my eating	6.33 (7.00)	2 – 1 (1.1) 3 – 1 (1.1) 4 – 2 (2.2) 5 – 6 (6.5) 6 – 35 (37.6) 7 – 48 (51.6)
The program sufficiently prepared me to improve my eating	6.23 (6.00)	3 – 1 (1.1) 4 – 3 (3.2) 5 – 11 (11.8) 6 – 36 (38.7) 7 – 42 (45.2)
The program helped me to feel confident to use what we learnt to be regularly physically active	6.29 (6.00)	3 – 1 (1.1) 4 – 2 (2.2) 5 – 12 (12.9) 6 – 32 (34.4) 7 – 46 (49.5)

Running head: AUSSIE-FIT PROCESS EVALUATION

The program sufficiently prepared me to be regularly physically active	6.26 (7.00)	2 – 1 (1.1) 4 – 3 (3.2) 5 – 13 (14.0) 6 – 28 (30.1) 7 – 48 (51.6)
--	-------------	---

The Aussie-FIT program met my expectations	6.04 (6.00)	2 – 1 (1.1) 3 – 5 (5.4) 4 – 2 (2.2) 5 – 10 (10.8) 6 – 38 (40.9) 7 – 37 (39.8)
--	-------------	--

It was important to me that this program was delivered in association with Freo/West Coast	5.39 (6.00)	1 – 3 (3.2) 2 – 3 (3.2) 3 – 3 (3.2) 4 – 9 (9.7) 5 – 23 (24.7) 6 – 31 (33.3) 7 – 21 (22.6)
--	-------------	---

It was important to me that the program was delivered at the Fremantle/West Coast facility	5.22 (5.00)	1 – 2 (2.22) 2 – 4 (4.3) 3 – 3 (3.2) 4 – 18 (19.4) 5 – 21 (22.6) 6 – 25 (26.9) 7 – 20 (21.5)
--	-------------	--

It was important to me that Aussie-FIT was a male only program	4.90 (5.00)	1 – 7 (7.5) 2 – 6 (6.5) 3 – 2 (2.2) 4 – 20 (21.5) 5 – 19 (20.4) 6 – 17 (18.3) 7 – 22 (23.7)
--	-------------	---

Note. The participants answered all questions on 1-7 scale (strongly disagree – strongly agree).

Online Supplement 4**Table 2***Ratings of Helpfulness of Each of the Aussie-FIT Program Activities.*

Content/Activity	Helpfulness Median (1-3 scale)	Frequencies (%)
Keeping a food diary (week 1)	2	1 – 2 (2.2) 2 – 45 (48.4) 3 – 41 (44.1) 4 – 3 (3.2) 6 – 2 (2.2)
Setting weight loss goals (week 2)	3	1 – 2 (2.2) 2 – 37 (39.8) 3 – 53 (57.0) 6 – 1 (1.1)
Setting PA goals (week 2)	3	1 – 1 (1.1) 2 – 25 (26.9) 3 – 66 (71.0) 6 – 1 (1.1)
Setting eating goals (week 2)	3	2 – 39 (41.9) 3 – 51 (54.8) 4 – 1 (1.1) 5 – 1 (1.1) 6 – 1 (1.1)
*Using the Fitbit to self-monitor activity (throughout)	3	1 – 4 (4.3) 2 – 14 (15.1) 3 – 75 (80.6)
*Using Facebook group (throughout)	2	1 – 11 (11.8) 2 – 46 (49.5) 3 – 25 (26.9) 4 – 11 (11.8)
*Discussions about identifying different types of motivation (red, green) (week 1)	2	1 – 4 (4.3) 2 – 47 (50.5) 3 – 37 (39.8) 5 – 2 (2.2) 6 – 3 (3.2)

Australian guide to healthy eating/food groups and portion sizes activity (week 2)	3	1 – 3 (3.2) 2 – 27 (29.0) 3 – 61 (65.6) 6 – 2 (2.2)
Talking about junk foods and food swaps (week 3)	3	1 – 2 (2.20) 2 – 28 (30.1) 3 – 61 (65.6) 6 – 2 (2.2)
Learning about food labels (week 4)	3	1 – 1 (1.1) 2 – 21 (22.6) 3 – 68 (73.1) 6 – 3 (3.2)
*Action and coping planning (week 4)	3	1 – 2 (2.2) 2 – 38 (40.9) 3 – 48 (51.6) 6 – 5 (5.4)
Cutting down on booze (week 5)	3	1 – 12 (12.9) 2 – 34 (36.6) 3 – 38 (40.9) 4 – 2 (2.2) 6 – 7 (7.5)
Visit from AFL player and talk on setbacks (week 6)	3	1 – 1 (1.1) 2 – 22 (23.7) 3 – 35 (37.6) 4 – 1 (1.1) 5 – 14 (15.1) 6 – 20 (21.5)
*Mobile application suggestions (week 6)	2	1 – 9 (9.7) 2 – 44 (47.3) 3 – 24 (25.8) 4 – 3 (3.2) 5 – 3 (3.2) 6 – 10 (10.8)
Weights as representation of weight lost (week 7)	3	1 – 2 (2.2) 2 – 36 (38.7) 3 – 38 (40.9) 5 – 3 (3.2) 6 – 14 (15.1)

*Tips for decreasing sedentary time (week 7)	2	1 – 2 (2.2) 2 – 40 (43.0) 3 – 35 (37.6) 5 – 4 (4.3) 6 – 12 (12.9)
Facts about fat, salt and sugar (week 8)	3	2 – 36 (38.7) 3 – 50 (53.8) 6 – 7 (7.5)
Developing habits and routines, watching out for triggers (week 8 and 9)	3	2 – 29 (31.2) 3 – 57 (61.3) 6 – 7 (7.5)
Eating out/looking at food menus (week 9)	3	1 – 1 (1.1) 2 – 34 (36.6) 3 – 50 (53.8) 6 – 8 (8.6)
Tips for cooking at home (week 10)	3	1 – 3 (3.2) 2 – 34 (36.6) 3 – 42 (45.2) 5 – 3 (3.2) 6 – 11 (11.8)
Dealing with setbacks (week 11)	3	2 – 39 (41.9) 3 – 42 (45.2) 4 – 1 (1.1) 6 – 11 (11.8)
Tips for maintaining weight loss (week 12/throughout)	3	2 – 35 (37.6) 3 – 49 (52.7) 5 – 1 (1.1) 6 – 8 (8.6)
Weekly goal reviews and revisions (throughout)	3	1 – 1 (1.1) 2 – 36 (38.7) 3 – 55 (59.1) 6 – 1 (1.1)
*Regular review of personal motivation (throughout)	3	1 – 2 (2.2) 2 – 34 (36.6) 3 – 56 (60.2) 6 – 1 (1.1)

Note. The scale was 1-3 (1 – not helpful, 2 – quite helpful, 3 – very helpful; 4 – N/A – I chose not to do this; 5 – N/A – I do not remember this; 6 – N/A – missed this session. Sessions marked with * are new components that were not included in the original FFIT program.

Online Supplement 5

Table 3*Descriptive Statistics of Motivational Meaning in Aussie-FIT Sessions*

		N	Min	Max	Mean	Std. Deviation	Variance
Motivationally thwarting behaviours	Comparing participants against each other or being overly competitive	12	0.00	0.00	0.00	0.00	0.00
	Criticising, belittling, devaluing or dismissing participants	12	0.00	1.00	0.08	0.28	0.08
	Using a language or a tone that is pressurising or could induce feelings of guilt or shame when communicating commands or goals	12	0.00	2.00	0.16	0.57	0.33
	Showing disregard or rejection for participants' feelings, preferences, opinions and feedback	12	0.00	2.00	0.25	0.62	0.38
Motivationally neutral behaviours	Offering choices that are not meaningful	12	0.00	2.00	0.25	0.62	0.38
	Providing goals and rules with no explanations, or explanations that are unclear or confusing	12	0.00	7.00	0.83	2.03	4.15
	Talking in ways that are motivationally "empty" (e.g., "keep going")	12	0.00	19.00	5.25	6.28	39.47
	No connection / Appearing to talk to a "camera"	12	0.00	1.00	0.08	0.28	0.08
Motivationally supportive behaviours	Acknowledging the participants' feelings and responding appropriately	12	0.00	5.00	1.00	1.59	2.54
	Giving specific and constructive feedback	12	0.00	9.00	1.66	2.74	7.51
	Creating opportunities to interact with all participants	12	0.00	9.00	4.08	2.67	7.17
	Creating sense of team unity, cohesion, inclusion and belonging	12	1.00	12.00	4.66	4.03	16.24
	Taking time to listen and be responsive to the participants' needs	12	1.00	16.00	9.16	4.50	20.33

	Encouraging questions and feedback from the participants about their goals, problems or preferences	12	1.00	19.00	9.41	6.02	36.26
Motivationally supportive behaviours	Offering meaningful praise which is unconditional	12	0.00	20.00	5.58	6.78	46.08
Motivationally supportive behaviours	Create opportunities for the participants to have input, choice and make decisions about the session, or about their eating and PA behaviours	12	0.00	18.00	10.83	4.82	23.24
Motivationally supportive behaviours	Giving meaningful and appropriate explanations	12	1.00	16.00	11.16	3.85	14.87
Motivationally supportive behaviours	Using an inclusive language (e.g., “we could try...”)	12	2.00	25.00	12.33	6.25	39.15
	Valid N (listwise)	12					

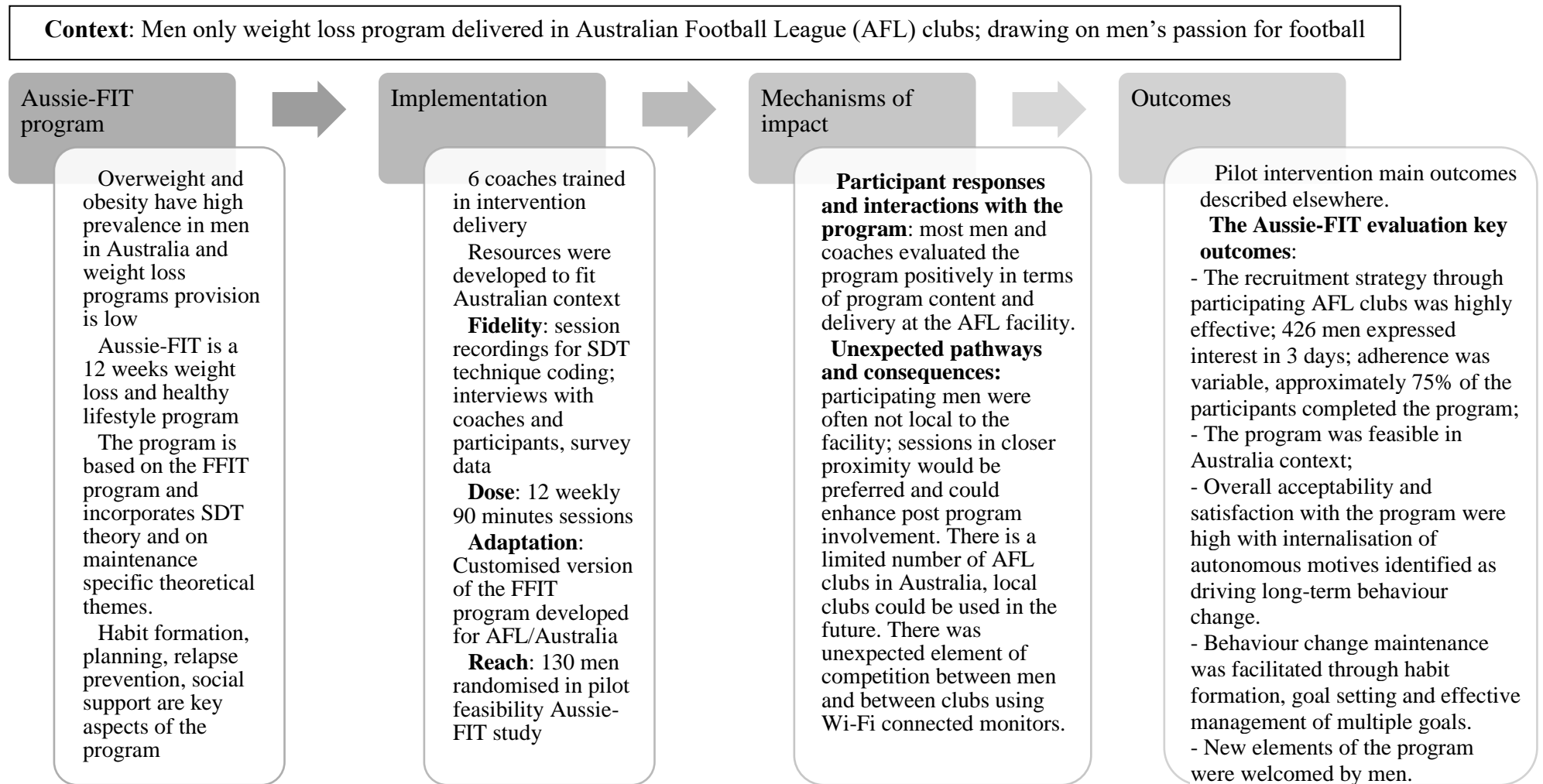


Figure 1. Key functions of process evaluation; investigation of implementation, mechanisms of impact and context by a clear intervention description and informed interpretation of outcomes; adapted from Moore et al. (2015)