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## Using segmentation to co-design a healthy eating program

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### ABSTRACT

Segmentation avoids “one size fits all” approach acknowledging that people differ in their needs and wants. This study applied segmentation during co-design to develop ideas for a healthy eating program for Australian Defence Force (ADF) personnel. Three co-design sessions were conducted with 73 ADF trainees to uncover segment-preferred solutions to encourage healthy eating. The segments provided different co-designed programs emphasising the need for tailored strategies. This study demonstrates how segmentation can be built into co-design process and the segmented preferences for a healthy eating program. The findings confirm that segmentation should be applied in health marketing ensuring effective resource allocation.

### KEYWORDS

Co-design; healthy eating; preferences; segmentation

## Introduction

Eating behaviour is complex and influenced by a myriad of components encompassing a range of individual, social and structural components (Carnell et al., 2013; Llewellyn & Wardle, 2015). These factors can influence eating behaviours subconsciously as eating is very habitual and automatic (Van't Riet et al., 2011). It has been established that military personnel often do not follow nutritionally optimal diets (Barlas et al., 2013; Kullen et al., 2016) and new recruits in particular struggle to meet nutritional requirements given their diet is unsuitable for the vigorous physical activity they are required to perform (Skinner et al., 2005). Eating behaviour research in military populations that focuses on developing and implementing eating behaviour programs is limited with the existing research mainly focusing on areas such as nutritional supplements (Knapik et al., 2018),

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sociodemographic characteristics of overweight and obesity (Hruby et al., 2015) and ration pack contents and delivery for training and combat missions (Lenferna De La Motte et al., 2023). Furthermore, these studies utilise a “one size fits all” approach failing to acknowledge that smaller groups with similar needs and preferences within the groups exist.

Segmentation avoids a “one size fits all” approach, acknowledging that people are wired differently (Cougnon & Anciaux, 2024). One-to-one marketing is best typified by organisations such as Amazon, Spotify and Netflix who generate individual recommendations using algorithms (Barwal et al., 2023; Huang et al., 2020; Martijn et al., 2022). In the absence of one-to-one marketing, segmentation is the next best way to develop a more nuanced understanding of the many different individuals that make up a target market. Research has identified that preferences differ between segments and segments respond differently to “one size fits all” programs (Arouna et al., 2021).

To identify segments, data is cluster-analysed to find individuals sharing common characteristics within a group, while demonstrating clear differences between groups. Segmentation is one of the benchmarks of social marketing and a key principle for design of effective social programs and reaching the targeted audience (Andreasen, 2002; French & Blair-Stevens, 2006). The International Social Marketing Association standards (iSMA, 2024) identify six key knowledge and skill function areas required for effective, efficient, and ethical Social Marketing Practice. Standard #3 is theory, insight, data, and evidence-informed segmentation. According to Standard #3, marketers need to know, and be able to apply, segmentation and persona development processes. Requisite skills include the ability for marketers to cluster analyse data to generate customer segments quantitatively and apply thematic analysis to develop personas.

The World Health Organization recommends that segmentation be applied to meet the values and needs of specific target audiences (World Health Organization, 2017). For example, the Tailoring Immunisation Program (TIP) (Tailoring Immunization Programmes (TIP), 2019) aims to maximise vaccine uptake. Within the wider TIP process the application of segmentation is recommended. According to the TIP (Tailoring Immunization Programmes (TIP), 2019, p. 35) process *“to focus on equity and allow segmentation of population groups, it is recommended that data are broken down by characteristics such as income and education.”* Recommended measures also include capturing behaviours (e.g. vaccine status). Segmentation can help health marketers apply limited resources more effectively (Dibb & Simkin, 2016). The application of segmentation enables interventions to be tailored appropriately to meet the unique needs and wants of different groups. For example, Lee et al. (2021) applied cluster

analysis drawing from a dataset of 530 University students identifying four segments who would be motivated differently to take up COVID-19 vaccinations. Segments differed across their area of study, personal and family vaccination behaviour, attitudes and intentions towards seasonal influenza vaccination, influenza-related information source channels, and responses to vaccine promotion messages and influencers.

Despite the advantages of using segmentation, recent reviews of the literature indicate that segmentation remains one of the least used principles in social marketing scientific research and practice. Dietrich et al. (2022) reviewed social marketing scholarly research and practice studies finding that segmentation (31%) is severely underused. This finding was also reflected in practice, with segmentation being used half the time (49%). This finding is supported by Firestone et al. (2017) and Schmidtke et al. (2021) who also found that segmentation was one of the least applied social marketing principles.

Other studies have previously identified that segmentation can provide a nuanced understanding of the differences that exist between identified groups (Czinkota et al., 2021; Sarstedt & Mooi, 2014). Three different segments were identified based on gender norms for men in a study aiming to increase participation in preventative health (McGraw et al., 2024). A study looking into wellness hotel customers identified four segments based on motivations to stay at a wellness hotel (Chi et al., 2024) and six segments among Swiss consumers were identified regarding attitudes towards microalgae foods revealing that segments with lower interest in traditional foods are more open to microalgae foods (Lucas & Brunner, 2024). Therefore, the current study aims to support consumer insight driven program design by allocating all co-design participants into their respective segments by utilising a short sorting tool.

### **Co-design**

User driven innovation stimulates behaviour change by focusing on co-creation (Trischler et al., 2019). In co-design user involvement is facilitated during program design to create programs and solutions that are user friendly (Voorberg et al., 2015). Co-design of innovations provides an opportunity to utilise the knowledge, insights and experiences of end users to accomplish effective solutions (Bird et al., 2021). Programs that are co-designed with end users are effective at increasing empowerment (Toledo-Chávarri et al., 2020). After idea generation and feasibility testing experts are engaged in program implementation to take ideas into action (Hurley et al., 2021). A seven-step iterative co-design facilitation process (see Table

**Table 1.** Seven-step co-design process and tasks.

Step	Tasks
Resourcing	Resourcing relevant materials such as academic literature or expert knowledge to underpin ideas to be tested during sensitisation step
Planning	Coordinating when and where co-design sessions will be conducted and who will be recruited
Recruiting	Participant recruitment
Sensitising	Familiarising participants with the topic by seeking feedback on range of ideas
Facilitating	Co-design facilitation and ideation where small teams put their user experience into practice and develop a program, they find useful
Reflecting	Analysing and synthesising the gained insights to identify most frequently appeared ideas
Building for change	Developing solutions with minimum feasibility with input from key stakeholders for further refinement

1) was introduced by Trischler et al. (2019) to facilitate and support creative engagement and contributions from participants.

Co-design has been successfully implemented in different contexts such as consumer engagement with social marketing digital media strategy for health promotion (Mehmet et al., 2020) and obesity prevention (Parsons et al., 2024) and the benefits of co-design have been recognised for researchers, end users and societies (Slattery et al., 2020). The importance and benefits of utilising user-centred approach to program design has been recognised, but limited application of targeted approaches for different end user groups is evident. A study utilising co-design to develop an integrated home-based primary care model for older adults reported segmenting the population, but it is unclear if the different population segments were part of the co-design process (Garasia et al., 2023). Furthermore, a need for targeted approaches and segmentation in co-design has been noted given that identifying user needs and preferences prior to co-design prevents having a mixed group of co-designers with competing needs leading to non-appealing outcomes (Fleming et al., 2019).

Previously Dietrich et al. (2016) attempted to integrate segmentation into co-design and reported results from six co-design sessions that were conducted with adolescents aged between 14–16 years old. Three alternative program solutions, catering to identified segments were identified in the research study. The Dietrich et al. (2016) study used unique identifier codes and students with matching identifier codes were classified into three segments however, some participants weren't classified into their segments due to mismatched codes and segments were mixed with participants representing different groups in one segment.

Taken together, intergovernmental organizations and global associations recommend that segmentation be applied in health marketing. Evidence is accumulating acknowledging that rates of behaviour change are higher when all social marketing principles are applied (Dietrich et al., 2022). While examples of segment preferences are available, deficits in the

approach applied to date are evident. This study extends past research demonstrating preference outcomes for a healthy eating intervention that can be applied in a workplace setting. Specifically, the application of the seven-step co-design process (Trischler et al., 2019) is detailed, including the allocation of all study participants into their segment groups. Therefore, the aim of this paper is to explain how segmentation can be applied within a co-design process by allocating individuals into segments to enable each segment to identify program preferences and design tailored offerings that would appeal to them—in essence, designing a program at a segment and not whole of population level.

## **Materials and methods**

Three co-design sessions were conducted with Australian Defence Force (ADF) early career personnel to uncover solutions that would encourage healthy eating at the military base. The aim of the co-design sessions was to gain a better understanding of how a healthy eating program can be delivered to early career personnel ensuring segment level wants and needs were met. In step one of the co-design process, relevant materials such as academic literature and expert knowledge were resourced to underpin the ideas to be tested during sensitisation step. In step two, meetings with the research partner were held prior to conducting the co-design sessions to discuss needs and review materials to ensure content and delivery were tailored appropriately. A Creating Collective Solutions (CCS) process, which is a problem structuring method with a solution design step (Rundle-Thiele et al., 2023), had previously been conducted with key stakeholders within the military eating system. This process informed the co-design process by framing the problem as the need for trainees to eat well for health and performance. The co-design process was conducted in collaboration with the ADF research partner and was designed to be as inclusive as possible. The sessions provided a safe, non-threatening environment for participants to share their thoughts and opinions without fear of judgement and were planned as a series of discussions designed to acquire insights on preferred solutions. This study was a part of a collaborative research project between a university and the Defence Science and Technology Group of the Department of Defence. Ethical approval for the study was obtained through the Human Research Ethics Committees of both organisations (approval codes 2023/737; LD12-21).

### **Participant recruitment**

In step three the research team and the research partner identified suitable military bases for the sessions and the participant recruitment process was

coordinated with the military base where the targeted sessions were planned to be conducted. Co-design details and invitations to participate were provided via phone and email to those military personnel working with recruits and trainees. Planning meetings were organised to agree on the times, dates, and locations of the sessions for those bases interested in supporting co-design implementation.

A previous study identified three unique segments of ADF trainees (Kitunen et al., 2023): Breakfast skippers (18.9% of population), Weight conscious (42.9% of population) and Uninterested (38.2% of population). Breakfast skippers ( $n = 93$ , 36.6% bachelor's degree level educated) are relatively motivated to consume a healthy diet, possess moderate perceptions of their ability and opportunity to eat healthy and have moderately healthy eating habits. Weight conscious ( $n = 211$ , 100% high school level educated) are the most motivated to consume a healthy diet, have the strongest belief in their ability and opportunity to eat healthy and have the healthiest eating habits. Uninterested ( $n = 188$ , 100% high school level educated) reported the lowest motivation to consume a healthy diet, lowest perceptions of their ability and opportunity to eat healthy and have the least healthy eating habits. Prior to the commencement of the co-design sessions, the early career personnel were allocated into these three healthy eating segments using a short five question sorting tool (Carins et al., 2022).

### ***Sensitisation to the topic***

Co-design materials were used to familiarise participants with existing approaches to encourage healthy eating. In total 10 idea templates had been developed in Step 1 (existing initiatives in the military eating and health system and academic literature were used as examples), with examples ranging from information on health and performance to mess improvements and were presented to participants during co-design sessions. Idea templates (see [Figure 1](#) for example) were administered within the 90-minute co-design session as a warm-up exercise to sensitise participants to the topic. Each participant is encouraged to freely express their opinions. Presentation of idea cards ensures co-design participants become active participants within the co-design session, and it also helps participants to understand a range of strategies that can potentially be applied to encourage healthy eating at the base.

### ***Co-design facilitation***

An experienced facilitator from the research team, supported by a skilled co-facilitator, led each of the co-design sessions. The co-design sessions



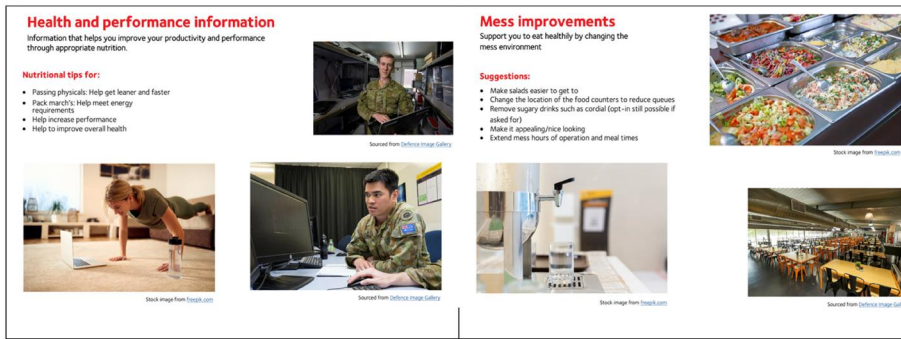


Figure 1. Examples of idea cards.

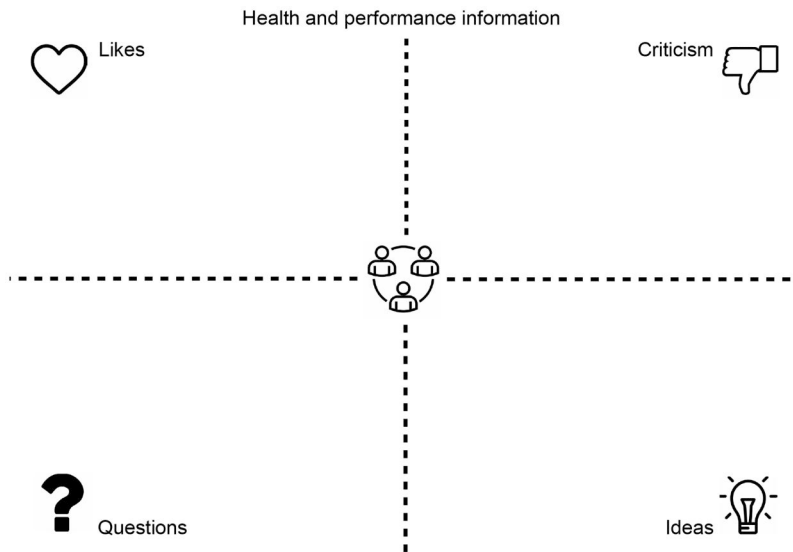


Figure 2. Feedback capture grid.

covered the sensitisation and facilitation steps of the seven-step process (Trischler et al., 2019) and were split into four stages, 1: introduction and priority survey; 2: warm up with idea templates and group discussion; 3: co-design and 4: pitch presentation. Stage 1 introduced the session aims and expectations, and participants completed an individual task where they were asked to provide up to 5 priorities that could be applied in the ADF to support personnel to eat better for health and performance. In stage 2 participants were split into small teams of 3–6 and were presented with the idea templates. Individuals were asked to identify likes and dislikes for each idea using a feedback capture grid (see Figure 2). Stage 3 consisted of the co-design activity where in small teams of 3–6 participants were asked to design a healthy eating program that would appeal to them, and other people like them. Design teams were free to develop their own ideas or build upon the strategies presented on the idea cards. Teams were given creative



freedom to use or discard any of the strategies summarised in the idea templates. Each small team received a design package to facilitate their creative process including butcher's papers, pens, markers and post-it notes. Participants were asked to consider strategies to encourage healthy eating at the base such as what activities or programs they would like to participate in, what would encourage them to participate (e.g., incentives, building skills and knowledge), where they would like to participate (e.g., online or in person), how they would like to participate (e.g., one-on-one, group setting, peer-led, expert-led), why would a program like this interests them and others like them, and to consider how would they promote the program. In stage 4 each team nominated a member of their team to provide a short 1-minute overview (pitch) of their co-designed solution. The process of presenting group ideas fostered group empowerment and promoted a sense of achievement while enabling the research team to gain an accurate and more complete understanding of the co-designed solutions.

## Results

This section outlines the results of the co-design sessions which corresponds with the sixth step of the seven-step co-design process (reflecting). Information collected during the sensitisation stage (Most and least liked idea cards) is discussed, followed by analysis of the information from the co-design stage (the co-designed solutions developed by the design teams for each segment). Overall, a total of 73 ADF trainees participated in the co-design sessions. Three different sessions were held, one for each segment, with 4–7 groups in each session (4 groups in session for segment 1, 7 groups in session for segment 2 and 7 groups in session for segment 3).

### *Most and least liked ideas cards*

In step four participants were familiarised with the topic by seeking feedback on the idea cards. The segments differed in their likes and dislikes of the ideas (see [Table 2](#)).

Uninterested (segment 1) liked two out of the ten ideas the most, namely, experts and holistic healthy life skills training (4 groups liked both ideas). They preferred holistic advice on health overall, not just eating, that comes from experts as they consider experts as a reliable source of information. Breakfast skippers (segment 2) liked recipes (7 groups liked this idea) the most from the idea cards. They like consuming healthy meals and the idea of receiving information that helps improve their productivity and performance resonated with them. Weight conscious (segment 3) liked

**Table 2.** Segment differences.

Segment	Characteristics	Likes	Dislikes	Example quotes
Uninterested	Least motivated Least skilful Low on fruit and vegetables	Experts Holistic healthy life skills training	Tracking	"Experts know what they're talking about." "Gain more info you didn't know/record or care about." "We're not allowed to use our phone when we go into the field which it makes it hard to track."
Breakfast skippers	Motivated Somewhat Healthy Relatively skilful	Recipes	Mentoring Tracking	"Ways to cook food using minimal equipment found in the lines or at home." "Unless seeking significant weight loss/gain tracking doesn't matter or isn't required."
Weight conscious	Highly motivated Most skilful Highest fruit and vegetable consumption	Recipes Health and performance information Services	Tracking	"Easy, quick and simple meal ideas." "More physical training that is catered to job physical role." "Good idea to have the online menu but they need to improve mess and their services." "There is a need to educate yourself before tracking."

three out of ten ideas (recipes, health and performance information and services) (7 groups liked these ideas). They liked information on improving productivity and performance through healthy recipes and cooking tips which provide a variety of easy, quick, and simple meal ideas, that taste better and are tailored to their needs. Health and performance information that helps improve productivity and performance through nutrition resonated with them, as it focuses on specific goals such as passing physicals and physical training, and it is tailored to their physical job role.

All three segments disliked tracking (3 groups in segment 1, 4 groups in segment 2 and 5 groups in segment 3) their daily calorie intake but for somewhat different reasons. Uninterested did not feel knowledgeable enough about the nutritional value of the foods they consume to track their eating accurately and they felt that tracking is too much effort. Breakfast skippers indicated that they did not want to track each calorie they consume or be made to feel ashamed of occasionally consuming something unhealthy. It was noted that continuous tracking could also lead to an unhealthy obsession with eating or even eating disorders. Weight conscious indicated that tracking is too regulated and can cause eating disorders if not done correctly. Finally, they saw it as too time consuming and repetitive.

Breakfast skippers disliked the idea of mentoring (3 groups). They felt they can support themselves when it comes to staying on track with healthy eating. They also felt that mentors might push their own narrative rather than providing sound advice.

All segment groups provided similar feedback on how the mess could be improved. The groups collectively mentioned that the quality of food needs to be improved and suggested that bringing back army chefs instead of using catering contractors would be an improvement. They also indicated that the quantity and variety of food needs to be improved. They suggested having more vegetarian and vegan options, bigger salad bars, and more variety in meals. Finally, the groups indicated that the mess hours need to expand to allow more time for breakfast, particularly on the days when they have physical training sessions in the morning.

**Co-designed solutions**

In step five co-design and ideation were facilitated where small teams used their experience and expertise to design a program. In step six the research team reflects on the co-design findings and ideas are analysed to identify most frequently appeared ideas and in step seven solutions with minimum feasibility are developed as a part of building for change where key stakeholders are engaged for further refining the solutions. All segments used some elements of the idea cards in their strategy design, but segments differed in their proposed solutions (see Table 3).

Uninterested designed an app that provides information on how to eat healthy and what to eat considering different diets. They also wanted help from experts, role models and through peers, and suggested flexible meal-times at the mess to allow more time to consume breakfast around physical training (PT) sessions.

Breakfast skippers designed an app along with a website that provides weekly meal preparation ideas that can be shared with friends, that allows adding in daily workouts and provides tips on how to cook healthy food. They suggested mess improvements, including having the ability to give the mess ideas on what they want to eat and pre order meals (e.g., with an iPad) as they are more likely to eat the food if it is something they want. They wanted to have more grab and go options especially in the morning

**Table 3.** Co-designed solutions.

	Uninterested	Breakfast skippers	Weight conscious
Healthy eating app (what to eat and how to eat healthy)	✓		
Help from experts and role models	✓		
App with weekly meal preparation ideas, workouts and cooking tips		✓	✓
Mess improvements: grab and go breakfast, big salad bar, healthier side dishes		✓	
Education on nutrition and access to nutritionists		✓	✓
Body scan with health experts linking results to training			✓
Third-party food providers at mess (e.g., Zambrero)			✓
Physical meal plan with information on healthy eating, what to buy and how to cook			✓

after PT, a big salad bar, more healthy sides, and blenders to make smoothies with. They suggested the menu should be available online. Additionally, access to nutritionists and regular sessions and education paired with online resources during any training lessons and during PT was preferred.

Weight conscious wanted to start with a body scan as soon as being assigned to the base to measure body fat and muscle weight. They stated this consultation with an expert should include blood tests to better understand their current situation. They suggested this should be used to associate physical training with healthy food, and that personal training be paired with mentorship that is not just about data but supports people through motivation and the provision of someone to talk to help them achieve their goals. They suggested the mess could have third-party options to add variety (such as Zambrero—a commercial Mexican restaurant) and have the menu available through a QR code at the mess so that they know what's available.

Weight conscious designed an app with a weekly meal plan that provides portions based on goals such as losing, gaining, or maintaining weight, and advice on how to improve your diet. The app would also include goals-based training with basic exercises, sleep health monitoring and would include the mess menu.

Additionally, Weight conscious designed different routines for different days such as starting a day with PT, having more stretching sessions and healthy breakfast accessible at their training wing instead of having the truck selling unhealthy foods. Extra training sessions were to be dedicated to information and education on nutrition.

Finally, they wanted a weekly meal plan. The plan would include information on healthy eating, helpful tips such as getting up early for breakfast, buying groceries on the weekend and supporting people with advice on how to cook basic healthy meals.

## Discussion

The aim of this paper was to demonstrate how segmentation can be applied within a co-design process to enable segments to identify program preferences and design offerings that would appeal to their unique segment groups. This study obtained preferences from one workplace population, analysed preference data at the segment level and gathered designs for each segment group ensuring no cross over between segment level preferences occurred. The contributions of this paper are twofold. First, this paper advances understanding of how the seven-step co-design process can be applied to gather segment-level preferences to inform program design for new programs

ensuring that the segment membership can be identified for all individual participants. The seven-step co-design process outlines a sequence of activities that are undertaken by project teams in the resourcing and planning, recruitment, sensitisation, and facilitation stages (Trischler et al., 2019). Segmentation was used at the commencement of the session. Participants were asked to answer 5 questions and based on the answers individuals were allocated into their segment group (Carins et al., 2022). Co-design sessions were held for each of the three segment groups ensuring that all designs were delivered at a segment level. Data was analysed to identify segment level similarities and differences. While past studies had identified differences in preferences between identified segment groups, the groups were mixed with participants from different segments, which may mean groups made compromises within their design to accommodate for differing preferences across segments (Kim et al., 2023). Furthermore, some co-design participants could not be matched into their segments, which may have introduced bias into the preferences yielded from the process (Dietrich et al., 2016; Fleming et al., 2019). The methods applied in this study ensured that all study participants were allocated into their segment and differences in preferences were evident between segment groups.

Second, this paper demonstrated how segment level preferences can be used to develop three target group driven programs that substantially differ from one another, and that are different from existing “one size fits all” healthy eating programs. The results indicated differences between the three segments in the co-designed healthy eating programs. This suggests that the development of three different programs could be warranted to understand if a tailored co-designed program will be more effective than a “one size fits all” program. For example, the co-designed programs included help from experts and role models to receive advice on overall health as experts were considered as a reliable source of information. This is supported by evidence revealing that influence from peers on eating and exercise may positively impact obesity prevention (Nabors et al., 2024). Tailoring and support from health professionals for holistic healthy life skills has been identified as important factor enhancing engagement (Verain et al., 2024). Both Breakfast skippers and Weight conscious included access to healthy recipes in their programs for quick, easy and simple meals to support their health and performance. Recipes have been found to be a quick, appealing and convenient resource that is easy to access (Roy et al., 2024). The findings suggests that even though all segments differed in their co-designed solutions some program elements can overlap with segments to provide tailored solutions to different segment’s needs.

All segments included mess improvements in their co-designed programs, indicating that choice architecture could be included as a part of a

program to support healthy eating. Choice architecture has been shown to be effective in a healthy eating context. Research showed that when healthy foods were made more prominent in a dining hall customers chose more of the healthier foods from the variety of options (Carins et al., 2017). Furthermore, when healthy lunch packs were made available in school canteens consumption of the healthy packs overtook the consumption of other not as healthy food options (Sanigorski et al., 2008). Providing a grab and go healthy breakfast option would support access to healthy meals in complementary ways around mess opening hours (Kenney et al., 2022). Broadening the mess operating hours would allow for more time to consume healthy breakfast around PT sessions supporting health and performance. Making salad bars more prominent or increasing the size or number of salad bars along with side dish sections in the mess would assist in selecting healthy options more frequently given programs using choice architecture are effective in improving diet-related outcomes (Chambers et al., 2021).

Digital tools especially mobile apps provide a promising platform enabling facilitation of a tailored approach. Nutrition messages can be effectively communicated, and behaviour change strategies facilitated via mobile apps (Seid et al., 2024). All segments co-designed a program that featured an app or a website but with slightly different functions and would benefit from a partially digital healthy eating program. Messages that are aligned with people's motivational orientation can significantly impact user engagement with an app that promotes healthy eating (Carfora et al., 2024). Therefore, the app must be tailored to consider segment differences to maximise user engagement. Ongoing motivation and support can be provided to Breakfast skippers and Weight conscious by features such as personalised progress trackers and customisable meal plans as goal-oriented users will appreciate features that celebrate achieving milestones (Carfora et al., 2024) whilst Uninterested would benefit from interactive forums that provide information on healthy eating. When messages match individuals' motivational goals greater interest is shown, and app download rates are higher compared to when the message is misaligned. Therefore, tailoring app descriptions to users' motivational focus can increase initial engagement among different segments (Carfora et al., 2024).

### ***Implications for health marketing***

It is essential that health marketers gain a profound understanding of their target groups to provide tailored programs that respond to the needs and preference of the groups (Parkinson & Davey, 2023). Health marketing should aim to identify the target segments and facilitate tailored training

offerings based on the different needs and preferences of these segments. This study showed how to identify segments of early career military personnel prior to program design and that the identified segments differed in their preferences of the presented program ideas and designed different healthy eating programs. The programs could include identifying what healthy foods are, how healthy food consumption supports health and performance and identifying support services for holistic health such as physical activity and sleep hygiene that are available and how to access these services throughout military service.

This moves beyond existing research by highlighting the need for segment specific solutions. Previous research has examined eating behaviours in the ADF but there has either been a very narrow focus such as looking into combat ration packs alone (Lenferna De La Motte et al., 2023) or when healthy eating programs have been implemented the focus has been on the entire population (Carins et al., 2017) potentially leaving some participants disengaged due to the program not matching the needs and preferences of different segments. Therefore, a health marketing program should aim to identify segments from the target population and co-design programs with the segments to maximise program uptake. The current study suggests a program providing elements to all segments specifically training on how to cook healthy foods with minimal equipment, education on what foods are optimal for health and performance and advice from experts on how to improve overall health beyond healthy eating such as physical activity and sleep. The training should start at the beginning of military service and continue throughout with different touchpoints and reminders to ensure thorough understanding and use of the strategies and training provided. These strategies can be supported by providing appropriate health marketing materials such as poster and pamphlets, online resources, ongoing communication and apps to enhance engagement and personalise programs to specific needs. Providing alternatives to unhealthy snacks and fast food within military bases would further support healthy eating behaviours.

### ***Limitations and future research***

This study is limited to one workplace population group, and therefore segmented co-design sessions with other populations in the same workforce, or with other workforces may generate different program designs. The study utilised a short form segment tool. Short form segmentation tools are user-friendly involving fewer questions when compared to long-form surveys that are needed to initially generate segments, so they support research teams by enabling fast group allocations. For example, Carins et al. (2022)



could correctly classify over 90% of the population using a 5-item short form segmentation tool saving respondents from having to answer the full 16 survey questions. Future research is recommended to test use of a long form segmentation survey approach within co-design to examine the cost benefits of the short form versus the benefits of higher accuracy that would provide through application of a long form segmentation survey.

This study is limited to the identification of segment level preferences. Future research is recommended to test the effectiveness of programs that are informed by the designs developed by each of the segments as reported in this research. Field trials could be used to test whether an intervention catering to segment preferences can outperform a “one size fits all” intervention approach. A field trial would permit a direct test of the utility of segmentation, and it would enable costs and benefits to be calculated to understand whether additional value is obtained from full application of segmentation.

## **Conclusion**

This study aimed to investigate how preferences for a workplace healthy eating program can be identified by allocating study participants into their segment groups prior to applying the seven-step co-design process. Furthermore, this study explained how all participants can be allocated into segments to identify program preferences and how these program preferences can be developed into tailored offerings that appeal to each segment. The findings showed that co-designed programs differed between the three segments and emphasised the need for tailored content strategies, especially regarding the different responses observed between the three segments. Future research is required to examine if the co-designed segment specific programs deliver better outcomes compared to a “one size fits all” program. This study delivers evidence of the usefulness and feasibility of segmented co-design aiming to change eating behaviour providing an important basis for further research in health marketing.

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