

A reflective paper on a small research project entitled:

Exploring the nutritional strategies of individuals prior to an early morning high intensity functional fitness class to better understand nutritional literacy and physical literacy within this specific group of athletes.

This paper is a reflection on a small research project which aimed to gather current data relating to nutritional strategies utilised by individuals prior to a morning workout. The main objective of the research project was to better understand people's perception of fueling and exercise in relation to their nutritional and physical activity needs and goals. Having identified from the literature the potential misinformation and potential health implications reported, the project aimed to support what is currently known and to better understand individuals' decision-making with their nutrition alongside their training and exercise. This paper has been written in conjunction with a digital poster displaying the key points, results and conclusion of the research project.

The topic for the research project links to the researcher's own interest in sports nutrition and how effectively information is communicated to athletes. Misinformation relating to nutrition is widespread across social media and general media platforms, and includes sports nutrition, making it difficult for individuals to find and trust evidenced-based information (Burke et al., 2018). As a registered dietitian, it's important to understand how different demographics access nutrition information and to establish their level of nutrition literacy (BDA, 2023), and in this specific project it

was also important to establish this along with their physical literacy. This information helps to inform how dietitians practice and communicate evidenced-based information with the general population, as well as with specific groups of individuals, across a variety of settings.

The root of this topic of interest is in energy intake in relation to sport and the issues associated with energy deficiency and its impact on performance and health, more commonly known as Relative Energy Deficiency in Sport (RED-S) (IOC, 2015), or its previous term The Female Athlete Triad (IOC, 2005). This topic is more widely spoken about within the sporting arena and amongst athletes, however not enough research has been conducted on those individuals who train regularly recreationally alongside their full-time careers and other life commitments, to ensure that they are taking on board sufficient calories to support their exercise and training goals. RED-S can be experienced by both men and women, hence the change in terminology to represent the impact on both genders, with symptoms including fatigue, illness, injuries, cessation of periods in females, reduced testosterone in males, reduced concentration and coordination, impact on long-term bone health, amongst other symptoms (Coyne and Woodruff, 2020; Cuhna et al., 2022). These symptoms can easily be attributed to an individual feeling tired or 'run down', rather than linking its cause as energy deficiency due to over-training or under-fueling – both knowingly and unknown (Mountjoy et al., 2015), something that has the potential to be overlooked or missed within the general population.

CrossFit is a global exercise brand which promotes its high intensity functional fitness (HIFF) style of competition and training, attracting some of the fittest individuals from

across the world to compete in its 'Open Games', a global competition open to all (Pearson and Jenkins, 2022). Alongside its training and competition programs, the brand also promotes a healthy 'clean living' lifestyle to its members (Maxwell et al., 2017; Pearson and Jenkins, 2022). HYROX is a relatively new form of HIFF, that has branded itself as functional fitness racing and is alleged to be completely different to CrossFit, however it is attracting a similar demographic to take on its competitions that are gradually becoming global much like the CrossFit brand (Upsolut Sports GmbH, 2024). It is within these circles and environments that tout a certain diet and lifestyle to its followers and members that disordered eating has been highlighted within the literature (Brisebois et al., 2022; Cunha et al., 2022; Pearson and Jenkins, 2022).. It's within these environments where RED-S could become an issue amongst those athletes at the grassroots level of HIFF, and it is at this level where the literature and research are both lacking and needs to be addressed. HIFF can be an effective form of exercise to aid weight loss, adapt body composition, increase strength, and build on cardiovascular health. However, depending on how individuals fuel these workouts, it could be impacting their performance or health goals negatively unbeknownst to those individuals who are striving to become healthy.

As a member of a well-attended HIFF gym in Cardiff, I had no issues in gaining access to this demographic of individuals, and the research project had the full support of the gym's owner and coach who allowed me to share the questionnaire with the gym's members. My intention was to create a questionnaire whereby participants could remain anonymous, had no triggering questions or topics discussed, and would take an individual no more than 3 minutes to complete. The questionnaire was created on Microsoft Forms, which was very easy to create and share to the members at the gym

via hyperlink which was emailed to all members and shared on the gym's private FaceBook page. I had intended to conduct a mixed-methods approach to the research, to give depth and better insight into participants' nutrition and exercise routines, creating a questionnaire consisting of 12 questions and included a mixture of quantitative questions and qualitative questions. The response rate to the questionnaire was higher than I'd anticipated, with 100 responses in total collected over 5 days, at which point I closed the questionnaire to ensure that the data collected was manageable to be analysed within the time scales set out for the research project.

The aim of the data capture was to better understand if individuals who regularly train early in the morning at a high intensity level fuel appropriately for their session, allowing them to perform at their best. The demographic of individuals being questioned were very specific due to a previous piece of research conducted by the researcher during the undergraduate dissertation looking at nutrition strategies of recreational female ultra-endurance athletes, showing a lack of fueling ahead of morning sessions. This lead me to hypothesize that other groups of individuals who train early in the morning are more likely to not fuel sufficiently or at all, either due to lack of time or due to nutrition advice sourced from non-evidenced base resources.

With the aim to capture individuals' reasons behind their nutrition choices, I found that the research project naturally aligned itself within qualitative research due to the objective of trying to understand the 'whys' behind their motives. However I felt that I needed to gather as much data as possible to add depth and a deeper understanding to the work which is why I decided to approach the work using mixed-methods, and

collecting both qualitative and quantitative data, and allowing me the opportunity to use the SPSS statistics software package to analyse part of the data. The other portion of the data would then get categorised or themed, and counted by hand the qualitative, or there was the option of using an alternative software called NVIVO to analyse that portion of the data.

Having finished the project and reflecting on the decisions that I made, hindsight has made me reevaluate my reasoning behind choosing mixed methods. For future projects I need to ensure that I allow more time for the design, and when considering questions that I'd like included for the project, thinking about what data I would like to gather during the process, but also to continue to consider the data when analysing and evaluating. I feel that time constraints were an issue with the project, including the time scale for the whole project, but also doing the project whilst working full-time and taking care of a young family. Although on one-hand I was fully aware of the time constraints which is why I chose a project that was low risk in terms of the ethics process and approval; however I feel that I should've spent more time and evaluation on the questionnaire itself before asking for responses. The importance of ensuring that your method of data collecting is as robust as it could possibly be only became apparent when it was too late to rectify.

It wasn't until I started to analyse the data in SPSS that I realised my error in the amount of quantitative data questions asked versus the qualitative data questions. This was a huge disappointment to discover at the analysis stage of the project, as I did not have enough time to reassess the questionnaire and gather a new data set. I tried numerous tests using the software to see if the data gathered would

present a statistically significant result, but unfortunately due to the lack of quantitative data I was not able to use the software, and resorted to analysing the qualitative data in conjunction with the small amount of quantitative data I'd gathered, but not to the extent that I had hoped.

As a researcher, I felt that at the start of the research project I had a clear concept in mind and that it would work well by gathering data using a mixed-methods approach., and although our ideas were discussed in a group setting with our module lead, this is where I feel that this project differed from a dissertation or a larger research project, as there was no dedicated supervisor to help guide and support the different projects from conception to reflection. I feel that I would've benefited from additional support, especially when considering my research methods and creating my questionnaire.

Due to size and timeframe of research project, I steered clear of questions that would be triggering for some individuals, including asking for anthropomorphic information, if they exercised for weight loss or body composition reasons, and if they fasted on purpose ahead of exercising. Due to the short time frame for the project and other time constraints of full-time work, I didn't want the ethics process to be any longer than it needed to be, which is the main reason for not including questions relating to weight and body composition in the questionnaire. I was also conscious of the ethics stance around using leading questions to influence those participants, I needed to remain unbiased and to keep my own beliefs at a distance from the research in case it influenced any of the data.

Having come to terms that the data I'd captured wasn't as comprehensively relevant for a mixed-methods form of analysis, I studied the full data set to via qualitative lenses to see what results could be discussed and did they meet my original aims and objectives for the project. Some results were expected – with a large percentage, 82%, saying that they don't eat before an early morning workout and cite time as a reason why – either pressed for time in the morning, or not wanting to get up any earlier than is necessary. The other reason for individuals not fueling is that they are concerned about digestive problems affecting their performance. Of the 18% who say that they do eat before a morning session, they reported that if they didn't eat, they would feel tired and not have enough energy to get through their workout and perform at their best.

Time and digestive problems are common barriers to athletes fueling prior to exercise, and although 82% isn't classed as statistically significant in a scientific study, it is still a large proportion of those individuals who aren't choosing to fuel their workouts on a regular basis. This number didn't surprise me; however, I was concerned due to the number of individuals who effectively trained fasted daily, specifically the number of women who trained fasted. Previous researchers have indicated the correlation between CrossFit athletes and disordered eating (Aird et al., 2018; Brisebois et al., 2022; Coyne and Woodruff, 2020; Cunha et al., 2022), which was one reason for conducting this study to better understand this demographic at grassroots level and if the literature would apply to this group as well as professional athletes (Trakman et al., 2016; Zouhal et al., 2020). This initial research project has shown that there could be some individuals within this cohort who may have disordered eating, however further research would need to be conducted with the same individuals to investigate

this hypothesis further. This expansion on the data could be captured via individual interviews, and there would need to be a contingency to ensure that those interviewed could seek additional support should they feel that they need it. These considerations are elements that would need to be approved via the ethics application, and something that I would need carefully consider before progressing due to the additional responsibility I would be putting on myself, but also asking of others involved.

Amongst some of the answers to the qualitative questions were some worrying comments showing a lack of understanding or education in relation to both nutritional literacy and physical literacy. As dietitians and performance nutritionists we're taught not to assume that people are aware of how the human body functions daily compared to when it's exercising, and the effect that food has on the body, again for general homeostasis and when being active. Some comments also alluded to the difficulty of finding reputable information that an individual can trust on the internet, text or in person. As a health professional, I am aware of this fact daily within my role as a registered dietitian, highlighting the need for better communication of evidenced-based information. This may be where this data can be considered for further research, in trying to identify ways in which individuals search for nutrition information and how they would be able to identify if the information was trustworthy. This would help to continue to inform practice within dietetics and potentially help the profession to remain current in communicating and informing the public and specialist groups.

What this research project has provided is a snapshot of the data and an idea of the level of nutritional literacy and physical literacy is within the target demographic group, however I feel that I have not achieved an effective example of a mixed-methods

project as intended. There is scope to expand and build upon all the data gathered and analysed at dissertation level, however I'm currently unsure if this is something that I'd like to do, even so, by conducting this small research project it has helped me to better understand the different research methods and theories and how I might select and apply them when considering my dissertation.

As a way of giving back to the community of individuals who willingly participated in the research project, and also at the request of the HIFF gym owner where I was able to access these individuals, they have requested that I report back to the group the results of my research. The results will be shared via a presentation, looking at the data that was collated and discuss with the group how best to fuel for this intensity of workouts and the benefits of fueling the body for performance and health outcomes.

To summarise, this small project has identified some positives and negatives in the way that I approached the whole process and will no doubt benefit and influence my decisions when considering areas of research and methods at masters dissertation level. When considering ideas for dissertation, to have an awareness of the time constraints of my own life and work commitments. I pride myself in my organisational and time management skills, however I felt that this could've been managed better for this project and will look to improve on this for dissertation. One key point is ensuring that I identify the most suitable research methods for any future research project to enable all the data to be analysed to its full potential. If considering quantitative research methods, to fully consider all questions being asked, and how the data set can be analysed. I felt confident using all Microsoft applications for the project,

however need to be more confident using SPSS and NVIVO packages, as this will help with time management and organising the data.

I'm unsure if I will use the data collated from this project to expand further for my dissertation, or to consider a different area of research for that piece of work, however I feel positive looking ahead to my dissertation and look forward to taking all that I've learnt into any future research projects, with some defined aims for how to approach my ideas and research design as I've critically discussed throughout this reflective paper.

Word count: 2795

References

- Aird, T.P., Davies, R.W. and Carson, B.P., 2018. Effects of fasted vs fed-state exercise on performance and post-exercise metabolism: A systematic review and meta-analysis. *Scandinavian journal of medicine & science in sports*, 28(5), pp.1476- 1493.
- Brisebois, M., Kramer, S., Lindsay, K.G., Wu, C.T. and Kamla, J., 2022. Dietary practices and supplement use among CrossFit® participants. *Journal of the International Society of Sports Nutrition*, 19(1), pp.316-335.
- British Dietetic Association (BDA), 2023. Code of Professional Conduct. The British Dietetic Association, Birmingham.
- Burke, L.M., Hawley, J.A., Jeukendrup, A., Morton, J.P., Stellingwerff, T. and Maughan, R.J., 2018. Toward a common understanding of diet–exercise strategies to manipulate fuel availability for training and competition preparation in endurance sport. *International journal of sport nutrition and exercise metabolism*, 28(5), pp.451- 463.
- Coyne, P. and Woodruff, S.J., 2020. Examining the influence of CrossFit participation on body image, self-esteem, and eating behaviours among women. *Journal of Physical Education and Sport*, 20(3), pp.1314-1325.
- Cunha, M.C.F.D., Junqueira, A.C.P., Carvalho, P.H.B.D. and Laus, M.F., 2022. Disordered eating behaviors among CrossFit athletes. *Jornal Brasileiro de Psiquiatria*, 71, pp.280-287.
- International Olympic Committee (IOC), 2005. Consensus statement adopted on the Female Athlete Triad. <https://olympics.com/ioc/news/consensus-statement-adopted-on-the-female-athlete-triad>
- International Olympic Committee (IOC), 2015. IOC Consensus Statement on Relative Energy Deficiency in Sport (RED-S), beyond the Female Athlete Triad. <https://olympics.com/ioc/medical-research/consensus-statements#ancre17>
- Maxwell, C., Ruth, K. and Friesen, C., 2017. Sports nutrition knowledge, perceptions, resources, and advice given by certified CrossFit trainers. *Sports*, 5(2), p.21.
- Mountjoy, M., Sundgot-Borgen, J., Burke, L., Carter, S., Constantini, N., Lebrun, C., Meyer, N., Sherman, R., Steffen, K., Budgett, R., and Ljungqvist, A., 2015. Consensus statement: The IOC consensus statement: beyond the Female Athlete Triad – Relative Energy Deficiency in Sport (RED-S). *British Journal of Sports Medicine*, Volume 48, issue 7. BMJ Journals, BMJ Publishing Group Ltd & British Association of Sport and Exercise Medicine. <https://bjsm.bmj.com/content/48/7/491>
- Pearson, R.C. and Jenkins, N.T., 2022. Dietary Intake of Adults Who Participate in CrossFit® Exercise Regimens. *Sports*, 10(3), p.38.
- Trakman, G.L., Forsyth, A., Devlin, B.L. and Belski, R., 2016. A systematic review of athletes' and coaches' nutrition knowledge and reflections on the quality of current nutrition knowledge measures. *Nutrients*, 8(9), p.570.

Upsolut Sport GmbH, 2024. HYROX. <https://hyrox.com/the-history/>

Zouhal, H., Saeidi, A., Salhi, A., Li, H., Essop, M.F., Laher, I., Rhibi, F., Amani-Shalamzari, S. and Ben Abderrahman, A., 2020. Exercise training and fasting: current insights. Open access journal of sports medicine, pp.1-28.

THE END.