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Records to monitor intake and improve dietary habits, knowledge and behaviours in elite athletes

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Objectives

Traditional methods of dietary assessment used in sports nutrition are burdensome, prone to substantial error and resource-intensive, especially for the nutrition-professional if groups of athletes reside in different geographical areas⁽¹⁾. Therefore, new approaches to monitor dietary intake and provide nutrition care for athletes are warranted. Within apps, such as MealLogger, features including: image-based food records, social-media functionality for in-app personalised feedback to individuals or groups, peer-support, and a platform to deliver nutrition education material, may assist nutrition-professionals to deliver services.

Methods

The feasibility of using MealLogger was evaluated among a group of elite male hockey players (n=17). Participants were instructed to log meals for three days every week and then received individualised feedback from a sports nutritionist. Weekly in-app nutrition-education fact-sheets and videos were delivered through the app. Participants' compliance, engagement, usability and acceptance of MealLogger were evaluated through app-data analytics and a participant exit survey. A pre- and post-questionnaire assessed sport-nutrition knowledge.

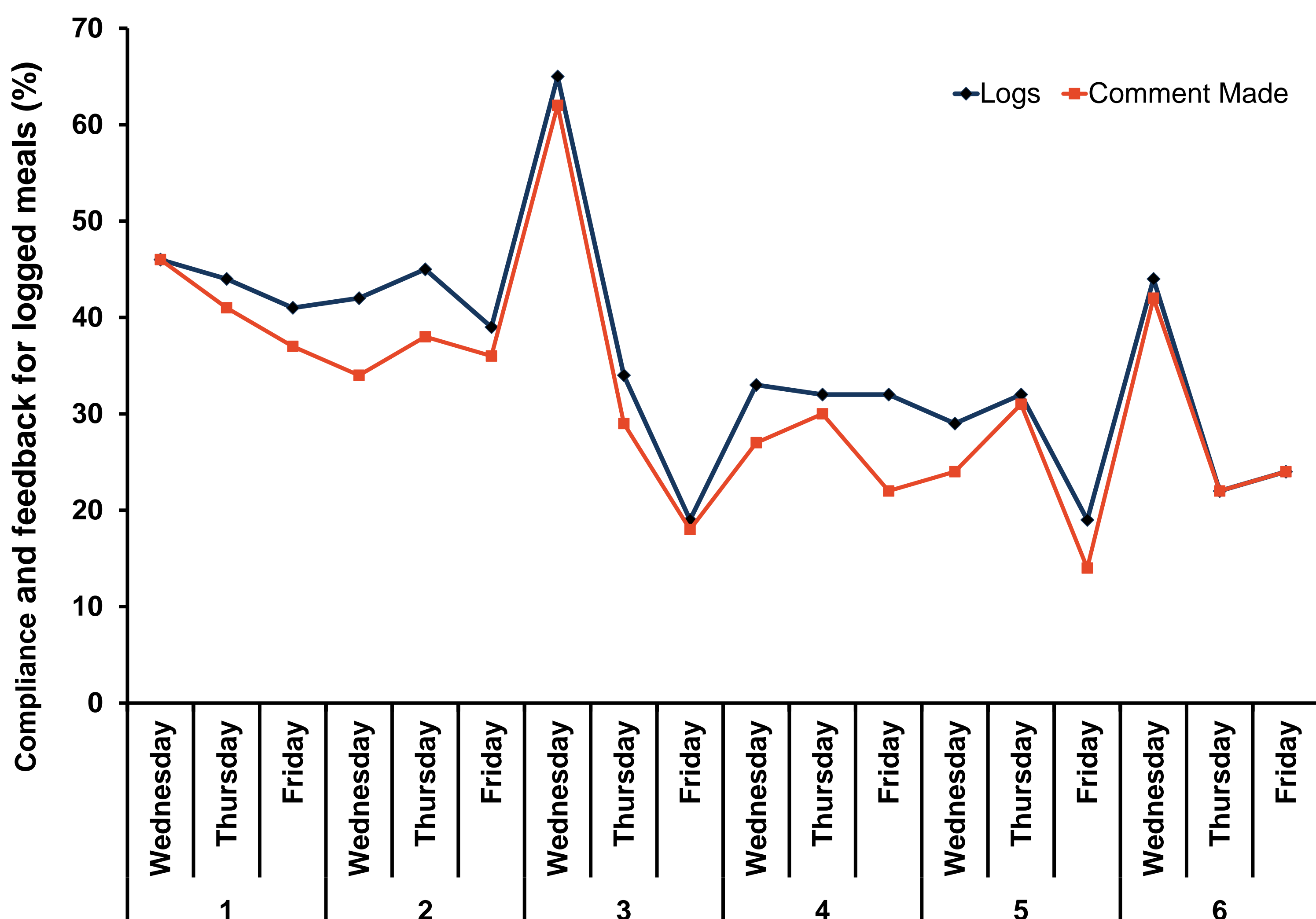


Figure 1. Compliance of meal logging and feedback provided by nutritionists during six week intervention.

Results

The participants were aged 18-20 years with a mean age of 19 years (± 0.7 std. dev). Participants trained on average 12 hours per week (± 4.3 std. dev), and participants were competing at an international (94%) or a national level (6%). Most participants were living with others in a flatting situation (52%) or living at home (35%), while 13% were living at a university hostel similar residence. Most participants 82.2% were also attending university.

Overall 577 meals were logged. Compliance with logging meals started at 86% (week 1) and decreased to 59% (week 6); overall compliance was 66% (Figure 1). Participants appeared engaged with the app, with 444 comments or "likes" generated on teammate's posts. Nutrition-professional support in the form of a comment or "like" was provided for 90% of logged meals, median response time was 39 min (min = 2 min; max = 60h 33 min).

Participants reported the education material received resulted in positive dietary behaviour changes (Figure 2) and many (13/17) also attributed the positive changes due to viewing other team members' meal-logs. Data analytics revealed the engagement with education material was highly variable depending on the weeks education theme (Table 1). Overall feedback indicated that using MealLogger was a positive experience, enhanced the team environment, and positively impacted team dynamics. Improved sport-nutrition knowledge corroborated participant feedback (pre: 55% versus post: 61% mean correct answers, $P=0.01$).

References

Poslusna K, Ruprich J, De Vries JHM, Jakubikova M, Van't Veer P. Misreporting of energy and micronutrient intake estimated by food records and 24hour recalls, control and adjustment methods in practice. Br J Nutr. 2009;101(SUPPL. 2):S73-S85.

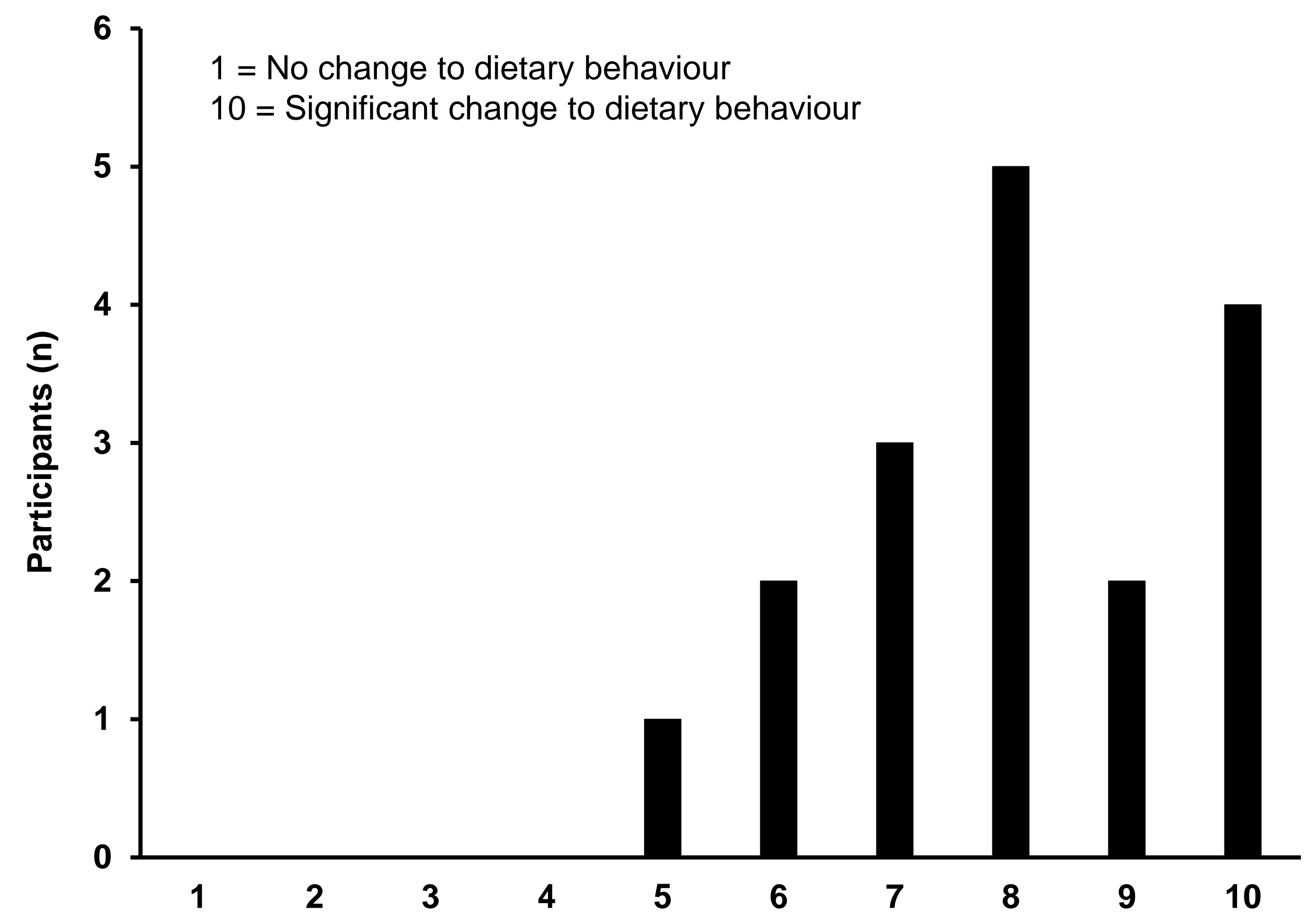


Figure 2. Self-reported impact of MealLogger and intervention on dietary behaviours.



Example of feedback provided to participant through the MealLogger app: "Awesome brekie! Full of fibre and complex carbs to give you slow burning energy across the day! Also nice to see you are having a good lean protein source (eggs) to aid muscle recovery & keeping on top of the hydration. –Great pre-game meal choice."

Table 1. Participant engagement with education material

Week	Week focus	Views/downloads of Fact Sheet	Views of Education Video
Week 1	Hydration	6	11
Week 2	Body composition	144	6
Week 3	Supplements	52	7
Week 4	Nutrition across a training week	2	7
Week 5	Event nutrition	6	3
Week 6	Nutrition for optimal recovery	4	4

Conclusions

Results from this pilot suggest using feature rich image-based apps, such as MealLogger, are an effective approach to monitor dietary intake, maintain client contact, and deliver nutrition-professional support for elite athletes. Further research should compare the efficacy of using image-based applications to monitor dietary intake and educate athletes against traditional approaches.



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