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Title	Development of measures of nutrition knowledge and attitudes in Singaporean athletes: exploring the relationships of nutrition knowledge and attitudes with dietary behaviour
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Abstract

Background: The Knowledge-Attitude-Behaviour (KAB) model is integral to nutrition interventions at the Singapore Sports Institute. The model suggests that knowledge influences one's attitudes, in turn leading to behaviour changes. Theoretically, the KAB model would be an effective model for nutrition interventions. However, this is thrown into question as the evidence supporting nutrition knowledge and dietary behaviour relationship in athletes is poor. Identifying relationships within the KAB model is necessary in order to assess whether it creates effective nutrition interventions.

Unfortunately, poorly constructed knowledge and attitude instruments compromise the assessment of the relationships within the KAB model.

Aims: The primary aim of this study was to develop well-constructed instruments that can be used to measure nutrition knowledge and attitudes in Singaporean athletes. The secondary aim of the study was to conduct a pilot study exploring the relationships of nutrition knowledge and attitudes with dietary behaviour.

Hypothesis: It was hypothesized that attitudes mediate the relationship between nutrition knowledge and dietary behaviour in athletes.

Study Design and Methods: There were three stages to the proposed study:

Stage 1: Development of instruments to examine nutrition knowledge, and nutrition-related attitudes towards improving sports performance through dietary behaviour.

Stage 2: Empirical examination of the validity and reliability of the knowledge and attitude instruments was done with the help of 3 trained Sports Dietitians and 193 undergraduate student volunteers who completed the questionnaire instruments.

Stage 3: Administration of the knowledge and attitude instruments in a pilot study to critically examine the relationship of nutrition knowledge and attitudes with dietary behaviour in a group of 15 Singaporean national athletes (netballers).

Results: A significant moderate positive correlation between the total score of the Nutrition Knowledge Questionnaire and the Attitudes subscale score was observed in a group of 193 undergraduate students ($r = 0.333, p < 0.01$). Positive correlation, albeit non-significant, was also observed when 33 of these undergraduate students were re-tested ($r = 0.259, p > 0.05$) and also in a team of 15 national netball players ($r = 0.508, p > 0.05$). Preliminary results from the pilot study conducted on netballers found that nutrition knowledge predicted dietary behaviour, as expected. Attitudes, however, were found to be a significant negative predictor of dietary behaviour and contrary to the hypothesis, did not mediate the relationship between nutrition knowledge and dietary behaviour.

Conclusions: The nutrition knowledge and attitude instruments created in this study were valid and reliable. Results from the study have offered some clarity for the relationships within the KAB model. These findings were in line with the suggested knowledge-attitude-behaviour relationship in the KAB model. More research is needed to gather a complete picture of the influence of attitude on dietary behaviour. Application of these findings would spearhead future nutrition education interventions in athletes.