

Abstract

An Investigation of Dietary Iron Intake and Literacy among 11–14 Year Old Females in New Zealand †

Renee Jansen , Pamela von Hurst , Jerushah Keightley, Hajar Mazahery  and Claire E. Badenhorst * 

School of Sport, Exercise and Nutrition, College of Health, Massey University, Auckland 0632, New Zealand

* Correspondence: c.badenhorst@massey.ac.nz; Tel.: +64-92136410

† Presented at the Annual Scientific Meeting of the Nutrition Society of New Zealand 2022, Wellington, New Zealand, 1–2 December 2022.

Abstract: Iron deficiency is the most prevalent micronutrient deficiency globally and is a common diagnosis in adolescent females. Causal factors for this population include low dietary iron intake, iron bioavailability, increased iron requirements and excessive iron losses. Iron intakes of adolescent females were last analysed in the 2002 New Zealand Children’s Nutrition Survey, reporting an average intake of 9.9mg/day. Up-to-date information on dietary iron intake and literacy in adolescent females is not available to health professionals. Therefore, this study’s aim was to determine dietary iron literacy and its associations with dietary intakes of iron-rich foods in young adolescent females within New Zealand. Females ($n = 286$) aged 11–14 years from all-girls schools around New Zealand were recruited to complete an anonymous online questionnaire. The questionnaire comprised demographic questions, an adapted iron literacy questionnaire and a validated iron food frequency questionnaire. The results suggest a moderate level of iron literacy in most participants (66.8%, $n = 191$), with 21.7% ($n = 62$) demonstrating low dietary iron literacy and 11.5% ($n = 33$) demonstrating high dietary iron literacy. Vegetarian, pescatarian, and vegan participants had higher iron knowledge scores than those not on a particular diet ($p = 0.001$). Age had a weak relationship with iron knowledge score category ($\chi^2 = 6.27$, $p = 0.044$). Significant differences were found between ethnic groups and food group consumption frequency. Seafood and legumes, eggs, nuts and seeds were eaten more frequently among Asian participants, while iron-fortified foods were eaten more frequently among Māori participants. Participants from higher decile schools were found to consume red meat ($p = 0.009$), seafood ($p = 0.024$) and fruit ($p = 0.021$) more frequently than those from moderate decile schools. There was no relationship between dietary iron literacy score and intake of iron-rich foods. Our results demonstrate that iron literacy is low to moderate among adolescent females within New Zealand and is not associated with current dietary iron intake behaviours. Future studies may consider educational interventions to change intake behaviours, and objective measures of iron status and food intake via biochemical data and food recalls.

Keywords: iron; iron intake; iron knowledge; literacy; dietary iron; dietary patterns; adolescents



Citation: Jansen, R.; von Hurst, P.; Keightley, J.; Mazahery, H.; Badenhorst, C.E. An Investigation of Dietary Iron Intake and Literacy among 11–14 Year Old Females in New Zealand. *Med. Sci. Forum* **2023**, *18*, 23. <https://doi.org/10.3390/msf2023018023>

Academic Editors: Claire Smith, Sally Mackay, Shabnam Jalili-Moghaddan and Michelle Gibbs

Published: 21 March 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Author Contributions: Conceptualisation, methodology, R.J., C.E.B., P.v.H. and J.K. Investigation, R.J. Data curation, R.J. and H.M. Writing—original draft preparation, R.J. Writing—review and editing, R.J., C.E.B., P.v.H. and H.M. Supervision, C.E.B. and P.v.H. Project administration, R.J. Funding acquisition, C.E.B. and P.v.H. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Beef + Lamb New Zealand.

Institutional Review Board Statement: This project has been evaluated by a peer review and judged as low-risk. Consequently, it has not been reviewed by one of the University’s Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you want to raise with

someone other than the researcher(s), please contact Professor Craig Johnson, Director of Research Ethics, by emailing humanethics@massey.ac.nz (reference 4000025457).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study, prior to their completion of the questionnaire.

Data Availability Statement: Raw data that support the findings of this study are available from the corresponding author, upon reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.