Optimising dietary intake and nutrition related health outcomes in Aboriginal women and their children

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Thesis by publication

I hereby certify that this thesis is in the form of a series of published papers of which I am joint author. I have included as part of the thesis a written statement from each co-author, endorsed by the Faculty Assistant Dean (Research Training), attesting to my contribution to the joint publications.

...........................................................

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Conflict of interest

Amy Ashman reports no conflict of interest.
Publications and presentations arising from this thesis

Manuscripts in peer-reviewed journals: Published


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Nutrition Society of Australia Annual Scientific Meeting, Melbourne, Australia, November 29th–December 2nd, 2016 (Poster presentation).


Author note

The studies outlined in this thesis were set in Tamworth, Walgett and Newcastle, in the state of New South Wales (NSW), Australia. I would like to acknowledge the traditional custodians of these lands; the Gomeroi people of Tamworth, the Kamilaroi people of Walgett, and the Awabakal and Worimi people of Newcastle. I would like to pay my respects to Elders both past and present and children of the present and future, and extend this respect to Indigenous readers of this manuscript.

Throughout this document, the terms Indigenous and Aboriginal are both used. Indigenous Australians refer to both Aboriginal and Torres Strait Islander peoples, and the term Indigenous is used in this document to refer to Indigenous people throughout Australia, or Indigenous people internationally. In NSW, where the research described in this thesis takes place, the traditional custodians of the land self-identify as Aboriginal, rather than Indigenous. Therefore in this thesis ‘Aboriginal’ is used to describe research study participants in the Gomeroi gaaynggal and Diet Bytes and Baby Bumps studies. For publications in international journals, the term Indigenous has been used.

The PhD candidate is an Accredited Practising Dietitian (APD), and therefore the research described in this thesis is from a dietitian’s perspective, with reference to how members of the dietetic profession can assist with optimising the dietary intakes and nutrition-related health outcomes of Aboriginal mothers and their infants.
Glossary of common abbreviations

ACAES: Australian Child and Adolescent Eating Survey
AES: Australian Eating Survey
AGTHE: Australian Guide to Healthy Eating
APD: Accredited Practising Dietitian
BMI: Body Mass Index
CI: Confidence Interval
DAA: Dietitians Association of Australia
DBBB: Diet Bytes and Baby Bumps study
EAR: Estimated Average Requirement
FFQ: Food Frequency Questionnaire
IQR: Interquartile Range
kg: Kilograms
mg: Milligrams
n: Numbers (sample)
NHMRC: National Health and Medical Research Council
NRV’s: Nutrient Reference Values
NSW: New South Wales
PBF: Percentage Body Fat
RDI: Recommended Dietary Intake
SD: Standard Deviation
VFA: Visceral Fat Area
WHO: World Health Organization
µg: Micrograms
24-R: 24-Hour Food Recall
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Abstract

Aboriginal Australians have high rates of many chronic diseases, the causes of which are multi-factorial. Optimal nutrition throughout life is protective against a number of adverse health outcomes, and can begin with setting the scene for lifelong health in utero and in the first years of life. However, little is currently known about the dietary intakes of Aboriginal Australian women in pregnancy and in the postpartum period, and their children, particularly in early infancy. This thesis by publication is presented as a series of published research articles. Specific research aims and the results of studies arising from this thesis are summarised below.

Dietitians are well-placed to support and work alongside Aboriginal communities in developing and supporting strategies to optimise nutrition for Aboriginal woman and children. Dietitians must demonstrate cultural competency, however opportunities for practical experiences working with Aboriginal communities are limited during undergraduate nutrition degree programs. The aim of the first study was to evaluate the cultural awareness experiences of student and new-graduate dietitians working in an Aboriginal ArtsHealth setting. Six participants reported on their experiences through either written feedback (via email) or oral feedback (via semi-structured interview). A generic inductive approach was used for qualitative data analysis. Key themes emerged around ‘building rapport’ and ‘developing cultural understanding’. Some participants reported an increased understanding of the context around health disparity for Aboriginal Australians, and the experiences of the student and new-graduate dietitians were overwhelmingly positive.

To optimise nutrition, current nutrition practices and dietary intakes need to be quantified. The second study of this thesis reports on the dietary intakes and anthropometric and body composition measures of a sample of women and their infants from the Gomeroi gaaynggal study, a prospective longitudinal cohort of Aboriginal women and their children in regional NSW from pregnancy to five years postpartum. A cross-sectional analysis of n=73 mother-child dyads from three months to five years postpartum found a breastfeeding initiation rate of 85.9%, with
a median (interquartile range [IQR]) duration of 1.4 months (0.5 – 4.0). Introduction of infants to solid foods and cow’s milk were at 5.0 months (4.0–6.0) and 12.0 months (10.0–13.0) respectively. At one year postpartum 66.7% of women were overweight or obese, and 63.7% were overweight or obese at 2 years postpartum. Results from the Gomeroi gaaynggal cohort were preliminary, but suggest that women in this cohort may benefit from further support to optimise nutrition for themselves and their children.

Providing women with tailored nutrition advice requires appropriate tools for dietary assessment. Image-based dietary records are emerging as a novel method for dietary assessment that limits some of the participant burden associated with traditional methods of dietary assessment. The Diet Bytes and Baby Bumps study used image-based dietary records captured via smartphones and a purpose-built brief tool (the Selected Nutrient and Diet Quality [SNaQ] tool) to assess nutrient and food group intakes of pregnant women and to inform the delivery of tailored nutrition advice to participants during their pregnancy. Twenty-five women (27 recruited, including 8 Aboriginal Australians, one withdrawn, one incomplete), had image-based records appropriate for analysis. Median intakes of core food groups of grains and cereals, vegetables, fruit, meat and dairy were reported as being below recommendations, but intakes of energy-dense, nutrient-poor foods exceeded recommendations. Cohen kappa showed moderate to substantial agreement between the SNaQ tool and the nutrient analysis software when assessing adequacy of micronutrient intakes. Relative validity was established by comparison of the image-based dietary records and 24-hour food recalls. There were significant correlations between the two methods of dietary assessment for energy, macronutrients and micronutrient intakes ($r=.40–.94$, all $P<.05$), with acceptable agreement between methods. Seventeen women reported changing their diets as a result of receiving personalised nutrition advice. The DietBytes method of image-based dietary assessment was well-received, with 88% of participants stating they would use the method again, including all Aboriginal participants.
A systematic review was conducted to identify existing programs that have aimed to improve nutrition-related outcomes in Indigenous pregnant women worldwide, and to identify positive factors contributing to successful programs. This review consisted of 27 studies (20 programs) from Australia, Canada, and the United States of America; the most prevalent outcome measures were breastfeeding initiation/duration (n=11 programs) and birth weight (n=9 programs). Activities employed within programs that resulted in statistically significant improvements in health and/or nutrition outcomes included individual counselling and education, and involvement of peer counsellors or other Indigenous program staff. In successful programs, emphasis was placed on designing nutrition interventions in collaboration with Indigenous communities.

This research thesis has highlighted key areas for improving dietary intake and nutrition-related health of Aboriginal Australian women and their children, including breastfeeding duration, appropriate timing of introduction to solid food and cow’s milk, nutrient and food group intake of pregnant and postpartum women, and improving rates of overweight and obesity in women postpartum. An image-based dietary record method of dietary assessment has demonstrated relative validity and acceptability for dietary assessment of Aboriginal pregnant women and acceptability to guide nutrition counselling. Dietitians can best support Aboriginal women and children by working in collaboration with communities to optimise nutrition, and support practice-based student experiences during university training where possible to assist in development of cultural competency skills.