**Changing landscape of nutrition and dietetics research? A bibliographic analysis of top-tier published research in 1998 and 2018**

**Supplementary information**

**Table S1. Study Type 1**

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| **Study Type** | **Description** |
| **Descriptive Study** | Papers exploring frequency, patterns or predictors of behaviours (e.g. alcohol use, smoking, PA), or related variables such as knowledge, attitudes, healthcare practices, policy or legislation. These can include epidemiologic studies examining frequency or patterns of risk factors and how these may be related to disease at a community or population level. |
| **Measurement Study** | Papers developed or examining the qualities of a measurement instrument such as reliability, validity or acceptability. Data collection methods include the use of questionnaires, interviews, physiological assessments and observations |
| **Intervention Study** | Papers testing the effectiveness of interventions to modify preventative health risk behaviours and/or the implementation of best practices by healthcare professionals. Intervention publications were defined by the research aims rather than the study design or type of intervention. |

**Table S2. Study Design definitions as per NHMRC definitions 2**

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| **Systematic review/meta-analysis** | A systematic review involves systematic location, appraisal and synthesis of evidence from scientific studies. Meta-analysis is the pooled measure of effect from the studies included in the systematic review. |
| **Review** | Involves the non-systematic synthesis of evidence from scientific studies. |
| **Randomised controlled trial** | Unit of experimentation is allocated to either an intervention group or a control group, using a random mechanism (e.g. coin toss, random number table, computer-generate random numbers) and the outcomes from each group are compared. For this review, RCTs also include pseudo-randomised controlled trials which is where the unit of experimentation is allocated to either an intervention group or control group, using a pseudo-random method (e.g. alternative allocation, allocation by days of the week or odd-even study numbers) and the outcomes from each group are compared. |
| **Non-randomised controlled trial** | The unit of experimentation is allocated to either an intervention group or a control group, using a non-random method (such as patient or clinician preference/availability) and the outcomes from each group as compared. This can include a controlled before-and-after study, where the outcome measurements are taken before and after the intervention is introduced, and compared at the same time point to outcome measures in the (control) group. Can also include an adjusted indirect comparison, where 2 randomised controlled trials compare different interventions to the same comparator e.g. the placebo or control condition. The outcomes from the two interventions are then compared indirectly. |
| **Cohort study** | Outcomes for groups of people observed to be exposed to an intervention, or the factor under study, are compared to outcome from groups of people not exposed. Included: Prospective cohort study- where groups of people (cohorts) are observed at a point in time to be exposed or not exposed to an intervention (or the factor under study) and then are followed prospectively with further outcomes recorded as they happen. Retrospective cohort study- where the cohorts (groups of people exposed and not exposed) are defined at a point of time in the past and information collected on subsequent outcomes, e.g. the use of medical records to identify a group of women using oral contraceptives 5 years ago, and a group of women not using oral contraceptive and then contacting these women or identifying in subsequent medical records the development of deep vein thrombosis. |
| **Cross-sectional study** | A group of people are assessed at a particular point (or cross section) in time and the data collected on outcomes relates to that point in time i.e. the proportion of people with asthma in October 2004. This type of study is useful for hypothesis-generation, to identify whether a risk factor is associated with a certain type of outcome, but more often than not, the causal link cannot be proven unless a time dimension is included. |
| **Case-control** | People with the outcome or disease (cases) and an appropriate group of controls without the outcome or disease (controls) are selected and information is obtained about their previous exposure/non-exposure to the intervention or factor under study. |
| **Case series** | A single group of people exposed to the intervention (factor under study). Post-test: only outcomes after the intervention are recorded in the series of people, so no comparisons can be made. Pre-test/post-test: measures on an outcome are taken before and after the intervention is introduced to a series of people and are then compared (A.K.A. before and after study). |
| **Cost effectiveness study** | Cost-effectiveness analysis estimates the costs of health gains of alternative interventions, this can involve the calculation of DALYs, cost of the intervention, estimates of health gains 3. |
| **Qualitative research** | Utilise research techniques including ‘small-group discussion’ for investigating beliefs, attitudes and concepts of normative behaviour; ‘semi-structured interviews’, to seek views on a focused topic or, with key informants, for background information or an institutional perspective, ‘in-depth interviews’ to understand a condition, experience, or event from a personal experience, or event from a personal perspective; and ‘analysis of texts and documents’, such as government reports, media articles, websites or diaries, to learn about distributed or private knowledge 4. |
| **Mixed methods** | Is a research approach whereby researchers collect and analyse both quantitative and qualitative data within the same study 5. |

**Table S3. Summary of the translational research phases, based on National Institutes of Health and Institute Of Medicine descriptions 6**

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| --- | --- |
| **Translational research phase** | **Description** |
| T0 | Research which identifies a problem, or identifies an opportunity or approach to tackle a health issue.  Common to disciplines such as molecular or biological insights, behavioural research, or epidemiological research. |
| T1 | Involves the development of tests or other clinical interventions, but it can also lead to nonmedical interventions such as policy, behavioural, social, and other public health interventions. |
| T2 | Involves rigorous analysis and investigation of whether the new interventions improve health outcomes (in randomised controlled trials or other study designs). This research can contribute to evidenced based guidelines and recommendations by professional organisations and independent panels. |
| T3 | Includes investigations designed to increase uptake and implementation of evidenced-based recommendations into practice.  T3 research aims to investigate ways of moving evidence into health practice, and can include the assessment of: evidence-practice gaps; barriers of enablers of policy or practice change; quality improvement initiatives; or effectiveness, implementation and dissemination intervention trials. |
| T4 | Involves evaluation of the effectiveness and cost-effectiveness of interventions in the “real world” in diverse populations. |

**Table S4. Translation process of research 7**

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| --- | --- |
| **Basic Research** | Basic and pre-clinical studies that generate knowledge about new targets, markers, or pathways. |
| **Pre-clinical research** | T1 trials that generate knowledge about whether interventions work in humans. |
| **Clinical research** | Phase T2 and T3 trials that generate knowledge about whether interventions help (i.e. are interventions effective?). |
| **Clinical implementation** | Phase T4 and pragmatic trials that generate knowledge about whether interventions help patients in practice and how to implement them in these settings. |
| **Public Health** | Observational, outcome based studies and implementation research that generate knowledge about whether and how interventions improve population health (T4). |

**Table S5. Implementation and Dissemination themes (extracted for T3 or T4 studies)**

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| --- | --- |
| **Dissemination** | Is an active approach of spreading evidence-based interventions to the target audience via determined channels using planned strategies 8. Involves a carefully planned process that involves considering the target audience, the messages you want to get across and the communication strategies that will help you achieve this.  Is the targeted distribution of information and intervention materials to a specific public health or clinical practice audience. The intent is to spread knowledge and the associated evidence-based interventions 9. |
| **Implementation** | Implementation science is the study of methods to promote the adoption and integration of evidence-based practices, interventions, and policies into routine health care and public health settings to improve the impact on population health. Implementation science examines how evidence-based programs work in the real world. By using implementation science and implementation strategies, you can help bridge the divide between research and practice- and bring programs that work to communities in need 10. |
| **Adaptation** | The process of thoughtful and deliberate alteration to design or delivery of an interventions, with the goal of improving its fit or effectiveness in a given context. It can encompass any change made to an intervention, whether deliberately and proactively, or in reaction to unanticipated challenges that arise in a given session or context.  The adjustment of an intervention for different target populations, localities and organisational factors 11. |
| **Sustainability** | Describes to what extent an evidence-based intervention can deliver its intended benefits over an extended period of time after external support from the donor agency is terminated. 3 operational indicators of sustainability include (1) maintenance of a programs initial health benefits, (2) institutionalisation of the program in a setting or community, and (3) capacity building in the recipient setting or community.  The continued use of program components and activities for the continued achievement of desirable program and population outcomes. Sustainability may include decisions during the initial project planning or adoption, as well as organisational support and financial strategies during implementation 9. |
| **Scaling-up** | Refers to deliberate efforts to increase the impact of successfully tested health interventions so as to benefit more people and to foster policy and program development on a lasting basis 12. |

**Table S6: Study type, design and translational research phase for the four journals that remained the same across between 1998-2018.**

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| --- | --- | --- | --- | --- | --- |
|  | **1998**  **(n246)** | | **2018**  **(*n* 465)** | | † |
| **Study Type** | ***n*** | **Proportion (%)** | ***n*** | **Proportion (%)** | **P value**† |
| Descriptive | 194 | 78.9 | 388 | 83.4 | 0.178 |
| Intervention | 34 | 13.8 | 57 | 12.3 |
| Measurement | 18 | 7.3 | 20 | 4.3 |
| **Study Design** | ***n*** | **Proportion (%)** | ***n*** | **Proportion (%)** | **P value** |
| Case Control | 16 | 6.5 | 15 | 3.2 | <0.001 |
| Case Series | 27 | 11.0 | 7 | 1.5 |
| Cohort | 11 | 4.5 | 52 | 11.2 |
| Cross sectional | 21 | 8.5 | 39 | 8.4 |
| Non-randomised Trial | 25 | 10.2 | 7 | 1.5 |
| Non-Systematic Review | 84 | 34.1 | 218 | 46.9 |
| Other | 16 | 6.5 | 14 | 3.0 |
| RCT | 45 | 18.3 | 61 | 13.1 |
| Systematic Review/Meta-analysis | 1 | 0.4 | 52 | 11.2 |
| **Transition Phase** | ***n*** | **Proportion (%)** | ***n*** | **Proportion (%)** | **P value** |
| T0 | 217 | 88.2 | 421 | 90.5 | 0.006\* |
| T1 | 18 | 7.3 | 12 | 2.6 |
| T2 | 11 | 4.5 | 32 | 6.9 |
| **Translation process of research** | ***n*** | **Proportion (%)** | ***n*** | **Proportion (%)** | **P value** |
| Basic Research | 219 | 89.0 | 421 | 90.5 | 0.001\* a |
| Clinical Research | 8 | 3.3 | 32 | 6.9 |
| Pre-Clinical Research | 19 | 7.7 | 11 | 2.4 |
| Public Health | 0 | 0 | 1 | 0.2 |

**\*** IFDIT, Integrative Framework of Dissemination, Implementation and Translation;

\* Indicates statistical significance (p<0.05) based on 95% CI;

†Person’s chi squared statistical test for difference across time unless otherwise indicated.

a Fisher’s exact test

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