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Australian Longitudinal Study on Women’s Health (ALSWH) is a long-running survey funded by the Australian Government Department of Health to provide evidence to develop and evaluate policies to lead to better health for all Australian women. Now in its nineteenth year, ALSWH involves more than 50,000 women in four cohorts, selected from the Australian population.

When it began in 1996, the Study was designed to cover the adult lifespan, and comprised three age cohorts - young women aged 18 to 23 (now 36-41), mid-aged women aged 45 to 50 (now 63-68) and older women aged 70 to 75 (now 89-94). Since 2013 a new cohort of young women, born in 1989-95 and now aged 19-25, have been surveyed annually to ensure that the Study continues to cover the adult lifespan.

A major report describing the methods used to recruit this youngest cohort was prepared for the Australian Government Department of Health this year. The report also provides a description of the cohort’s health status, and compares their health with the health of women from the 1973-78 cohort when they were the same age in 1996. A brief summary of the report is presented here.

During the year we also prepared summary reports on the 1973-78 and 1921-26 cohorts, outlining the health trajectories and key issues for each cohort since the beginning of the Study in 1996. Highlights from each summary are presented later in this report.

This year ALSWH continued to survey the women in the oldest cohort - born in 1921-26 and now aged 89-94 - at six-monthly intervals, with surveys sent in May and November. The second survey of the new young cohort (born in 1989-95) was also completed, and pilot testing of the cohort’s third survey began in December. Our commitment to integrating and promoting new technology has continued, with more and more participants completing surveys online.

In addition to the main survey work, we have continued to conduct substudies and subsidiary analyses, enhance data quality and documentation, and produce scientific papers and conference presentations on all aspects of women’s health. This year linkage of de-identified ALSWH data with Aged Care data and other health datasets (such as State-based hospital, perinatal and cancer data) commenced, and several research projects using the linked data have begun. Topics under investigation include access to health services, and prevalence of conditions such as dementia.

This year has been my first year as ALSWH Director. The Study has come a long way since 1996 when I joined as the first statistician for ALSWH and it continues to evolve in exciting directions, allowing continued provision of invaluable evidence and insights to support the development of women’s health policy in Australia. I would like to give thanks to the Department of Health for their ongoing support for the Study, to my colleagues for all their hard work, and to the women who have continued their participation in the research.

Gita Mishra
Study Director
STEERING COMMITTEE

Professor Gita Mishra
BSc, MSc, PhD
Director, Australian Longitudinal Study on Women's Health
School of Public Health
University of Queensland

Professor Julie Byles
BMed, PhD
Co-Director, Australian Longitudinal Study on Women's Health
Director, Research Centre for Gender, Health & Ageing
University of Newcastle

Professor Wendy Brown
BSc(Hons), DipEd, MSc, PhD
School of Human Movement Studies
University of Queensland

Professor Jayne Lucke
BA(Hons), PhD
Australian Research Centre in Sex, Health and Society
La Trobe University

Professor Nancy Pachana
AB, MA, PhD
School of Psychology
University of Queensland

A/Professor Leigh Tooth
BOccThy(Hons), PhD
Deputy Director and Project Co-Ordinator Australian Longitudinal Study on Women's Health
School of Public Health
University of Queensland

Professor David Sibbritt
BMath, MMedStat, PhD
Faculty of Nursing, Midwifery and Health
University of Technology Sydney

A/Professor Deirdre McLaughlin
B.Beh Sc, BSc, PhD, MAPS
School of Public Health
University of Queensland

Dr Meredith Tavener
BAppSci (Hons), GradDip (Health Prom), MMedSci (Comm Med & Clin Epi), PhD
Research Centre for Gender, Health and Ageing
University of Newcastle

Ms Jenny Powers
BSc, Assoc DipAppSci(Comp), MMed Stat
Research Centre for Gender, Health & Ageing
University of Newcastle

Professor Christina Lee
BA, PhD, FAPS
School of Psychology
University of Queensland

A/Professor Deborah Loxton
BPsych(Hons), Dip Mgt, PhD
Deputy Director, Australian Longitudinal Study on Women's Health
Research Centre for Gender, Health & Ageing
University of Newcastle

Professor Nancy Pachana
AB, MA, PhD
School of Psychology
University of Queensland

A/Professor Leigh Tooth
BOccThy(Hons), PhD
Deputy Director and Project Co-Ordinator Australian Longitudinal Study on Women's Health
School of Public Health
University of Queensland

Professor David Sibbritt
BMath, MMedStat, PhD
Faculty of Nursing, Midwifery and Health
University of Technology Sydney

A/Professor Deirdre McLaughlin
B.Beh Sc, BSc, PhD, MAPS
School of Public Health
University of Queensland

Dr Meredith Tavener
BAppSci (Hons), GradDip (Health Prom), MMedSci (Comm Med & Clin Epi), PhD
Research Centre for Gender, Health and Ageing
University of Newcastle

Ms Jenny Powers
BSc, Assoc DipAppSci(Comp), MMed Stat
Research Centre for Gender, Health & Ageing
University of Newcastle
COLLABORATORS & INVESTIGATORS

This list includes the first named investigator or collaborator from all currently active projects as recorded through the ALSWH Expression of Interest process.
For more information please see www.alswh.org.au

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof Jon Adams</td>
<td>School of Public Health, University of Technology Sydney</td>
</tr>
<tr>
<td>Prof Marie-Paule Austin</td>
<td>Perinatal and Women's Mental Health, University of New South Wales</td>
</tr>
<tr>
<td>Prof Kylie Ball</td>
<td>School of Exercise and Nutrition Sciences, Deakin University</td>
</tr>
<tr>
<td>A/Prof Alexander Broom</td>
<td>School of Social Science, The University of Queensland</td>
</tr>
<tr>
<td>Dr Rhonda Brown</td>
<td>School of Nursing and Midwifery, Deakin University</td>
</tr>
<tr>
<td>Dr Nicola Burton</td>
<td>School of Human Movement Studies, The University of Queensland</td>
</tr>
<tr>
<td>Dr Catherine Chojenta</td>
<td>Research Centre for Gender, Health and Ageing, The University of Newcastle</td>
</tr>
<tr>
<td>Dr Bronwyn Clark</td>
<td>School of Human Movement Studies, The University of Queensland</td>
</tr>
<tr>
<td>A/Prof Lindy Clemson</td>
<td>Faculty of Health Sciences, The University of Sydney</td>
</tr>
<tr>
<td>Laura Cloostermans</td>
<td>Centre for Prevention and Health Services Research, National Institute for Public Health and the Environment, The Netherlands</td>
</tr>
<tr>
<td>Dr Linda Cobiac</td>
<td>School of Population Health, The University of Queensland</td>
</tr>
<tr>
<td>Prof Clare Collins</td>
<td>School of Health Sciences (Nutrition and Dietetics), The University of Newcastle</td>
</tr>
<tr>
<td>Prof Hugh Craig</td>
<td>School of Humanities &amp; Social Sciences, The University of Newcastle</td>
</tr>
<tr>
<td>Prof Patricia Davidson</td>
<td>Centre for Cardiovascular &amp; Chronic Care, University of Technology Sydney</td>
</tr>
<tr>
<td>Xenia Dolja-Gore</td>
<td>Research Centre for Gender, Health and Ageing, The University of Newcastle</td>
</tr>
<tr>
<td>Dr Kate Fairweather-Schmidt</td>
<td>School of Psychology, The University of Adelaide</td>
</tr>
<tr>
<td>Peta Forder</td>
<td>Research Centre for Gender, Health and Ageing, The University of Newcastle</td>
</tr>
<tr>
<td>Dr Cynthia Forlini</td>
<td>University of Queensland Centre for Clinical Research, The University of Queensland</td>
</tr>
<tr>
<td>Dr Paul Gardiner</td>
<td>School of Population Health, The University of Queensland</td>
</tr>
<tr>
<td>Dr Gerrie-Cor Gast</td>
<td>National Institute for Public Health and the Environment, The Netherlands</td>
</tr>
<tr>
<td>Dr Kristiann Heesch</td>
<td>School of Public Health, Queensland University of Technology</td>
</tr>
<tr>
<td>Prof James Herbert</td>
<td>Cancer Prevention and Control Program, University of South Carolina</td>
</tr>
<tr>
<td>Prof Isabel Higgins</td>
<td>Research Centre for Gender, Health and Ageing, The University of Newcastle</td>
</tr>
<tr>
<td>Dr Libby Holden</td>
<td>School of Population Health, The University of Queensland</td>
</tr>
<tr>
<td>Isobel Hubbard</td>
<td>School of Medicine &amp; Public Health, The University of Newcastle</td>
</tr>
<tr>
<td>Dr Alexis Hure</td>
<td>School of Medicine and Public Health, The University of Newcastle</td>
</tr>
<tr>
<td>A/Prof Rafat Hussain</td>
<td>School of Health, University of New England</td>
</tr>
<tr>
<td>Dr Caroline Jackson</td>
<td>School of Population Health, The University of Queensland</td>
</tr>
<tr>
<td>Dr Melissa Johnstone</td>
<td>School of Psychology, The University of Queensland</td>
</tr>
<tr>
<td>A/Prof Mike Jones</td>
<td>Psychology Department, Macquarie University</td>
</tr>
<tr>
<td>Dr Mark Jones</td>
<td>School of Population Health, The University of Queensland</td>
</tr>
<tr>
<td>Dr Asad Khan</td>
<td>School of Health &amp; Rehabilitation, The University of Queensland</td>
</tr>
<tr>
<td>Prof Ilona Koupil</td>
<td>Stockholm University &amp; Karolinska Institute</td>
</tr>
<tr>
<td>Jun Lai</td>
<td>Research Centre for Gender, Health and Ageing, The University of Newcastle</td>
</tr>
<tr>
<td>Dr Derrick Lopez</td>
<td>Centre for Health and Ageing, The University of Western Australia</td>
</tr>
<tr>
<td>Dr Lesley MacDonald-Wicks</td>
<td>Nutrition &amp; Dietetics, The University of Newcastle</td>
</tr>
<tr>
<td>A/Prof Dianna Maglino</td>
<td>Baker IDI Heart and Diabetes Institute</td>
</tr>
<tr>
<td>Dr Parker Magin</td>
<td>School of Medicine and Public Health, The University of Newcastle</td>
</tr>
<tr>
<td>Prof Michael Martin</td>
<td>School of Finance, Australian National University</td>
</tr>
<tr>
<td>Dr Samantha McKenzie</td>
<td>School of Population Health, The University of Queensland</td>
</tr>
<tr>
<td>Dr Seema Mihrshahi</td>
<td>School of Population Health, The University of Queensland</td>
</tr>
<tr>
<td>Nawi Ng</td>
<td>Research Centre for Gender, Health &amp; Ageing, The University of Newcastle</td>
</tr>
<tr>
<td>Prof Lynne Parkinson</td>
<td>Health CRN, CQ University Australia</td>
</tr>
<tr>
<td>Dr Amanda Patterson</td>
<td>School of Health Sciences, The University of Newcastle</td>
</tr>
<tr>
<td>Dr Toby Pavey</td>
<td>School of Human Movement Studies, The University of Queensland</td>
</tr>
<tr>
<td>Dr Geeske Peeters</td>
<td>School of Human Movement Studies, The University of Queensland</td>
</tr>
<tr>
<td>Prof Margot Schofield</td>
<td>School of Public Health, La Trobe University</td>
</tr>
<tr>
<td>Dr Elizabeth Spencer</td>
<td>School of Humanities &amp; Social Sciences, The University of Newcastle</td>
</tr>
</tbody>
</table>

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CURRENT STUDENTS

PhD Students

Amani Hamad Alhazmi
University of Newcastle
Supervisors: Prof Manohar Garg and Dr Elizabeth Stojanovski

Haya Mohammed Al-Jadani
University of Newcastle
Supervisors: Prof Clare Collins, Prof David Sibbritt and Dr Amanda Patterson

Maha Alsalam
University of Melbourne
Supervisors: Prof Julie Byles, Dr Milton Hasnat and Mark McEvoy

Amy Anderson
University of Newcastle
Supervisors: A/Prof Deborah Loxton, Dr Frances Kay-Lambkin and Dr Alexis Hure

Sue Conrad
University of Queensland
Supervisors: A/Prof Leigh Tooth, Prof Annette Dobson and A/Prof Deirdre McLauglin

Katie de Luca
University of Newcastle
Supervisors: Prof Lynne Parkinson, Dr Fiona Blyth, Prof Julie Byles and A/Prof Henry Pollard

Gina Dillon
University of New England
Supervisors: A/Prof Rafat Hussain, A/Prof Deborah Loxton, Dr Salfur Rahman and Dr Eva Kibele

Xenia Dolja-Gore
University of Newcastle
Supervisors: A/Prof Deborah Loxton, Prof Julie Byles and Prof Catherine D’Este

Jane Frawley
University of Newcastle
Supervisors: Prof David Sibbritt and Prof Jon Adams

Ellie Gresham
University of Newcastle
Supervisors: Prof Julie Byles and Dr Alexis Hure

Natalie Holowko
University of Queensland
Supervisors: Prof Gita Mishra, Prof Ilona Koupl, A/Prof Leigh Tooth and Dr Mark Jones

Anju Joham
Monash University
Supervisor: Prof Helena Teede

Hong Ju
University of Queensland
Supervisors: Prof Gita Mishra and Dr Mark Jones

Lucy Leigh
University of Newcastle
Supervisors: Prof Irene Hudson and Professor Julie Byles

Janni Leung
University of Queensland
Supervisors: A/Prof Deirdre McLaughlin, Dr Sam McKenzie and Prof Annette Dobson

Cassandra Jean Lindsey
University of Wisconsin-Madison
Supervisors: Prof Lynne Parkinson and Dr Paul Kowel

Thomas Lo
University of Newcastle
Supervisors: Prof Lynne Parkinson, Prof Julie Byles and Dr Michelle Cunich

Vijayendra Murthy
University of Newcastle
Supervisors: Prof David Sibbritt and Prof Jon Adams

Danielle Schoenaker
University of Queensland
Supervisors: Prof Gita Mishra, Prof Annette Dobson, Dr Sabita Soedamah-Muthu and Dr Gerrie-Cor Gast

Honours Students

Carmen Yee
University of Newcastle
Supervisors: Dr A/Prof Leigh Tooth, Prof Annette Dobson and Dr Michelle Cunich

Parvash Eftekhar
University of Newcastle
Supervisors: Dr Julie Byles and Peta Forder

Jia Yin Ooi
University of Newcastle
Supervisors: Dr A/Prof Deirdre McLaughlin, Dr Paul Kowel, A/Prof Leigh Tooth and Dr Michele Cunich

Angela Rao
University of Technology Sydney
Supervisors: Prof David Sibbritt, Dr Louise Hickman and Prof Jane Phillips

Jia Yin Ooi
University of Newcastle
Supervisors: Dr A/Prof Deirdre McLaughlin, Dr Paul Kowel, A/Prof Leigh Tooth and Dr Michele Cunich

Jananie Theiveyanathan
Australian National University
Supervisors: Prof Michael Martin and A/Prof Deborah Loxton

Louise Wilson
University of Queensland
Supervisors: Prof Gita Mishra, A/Prof Deirdre McLaughlin and Prof Julie Byles

Tazeen Majeed
University of Newcastle
Supervisors: Prof Julie Byles and Peta Forder

Dr Jennifer Stewart Williams
Research Centre for Gender, Health and Ageing, The University of Newcastle

Dr Angela Taft
Mother and Child Health Research, La Trobe University

Prof Nicholas Talley
Faculty of Health, The University of Newcastle

Prof Helena Teede
Monash Institute of Health Services Research, Monash University

Dr Janique Van Uffelen
Institute of Sport, Exercise & Active Living (ISEAL), Victoria University

Dr Lauren Williams
Faculty of Health, University of Canberra

Dr Melissa Harris
School of Medicine and Public Health, The University of Newcastle

Dr Graciela Muniz-Terrera
University College London

Dr Rachel Huxley
School of Population Health, The University of Queensland

Dr Leanne Brown
Department of Rural Health, The University of Newcastle

Dr Marit Laaksonen
University of New South Wales

Dr Enamul Kabir
School of Human Movement Studies, University of New South Wales

Dr Sungwon Chang
Faculty of Health, University of Technology Sydney

Dr Kathryn Backholer
Baker IDI Heart and Diabetes Institute

Prof Flavia Cicuttini
Department of Epidemiology and Preventative Medicine, Monash University

Dr Jency Thomas
School of Public Health and Human Biosciences, La Trobe University

Marlise Hofer
University of British Columbia

Bonnie Field
Centre for Research and Action in Public Health, University of Canberra.

Dr Luke Knibbs
School of Population Health, The University of Queensland

Alison Flehr
Department of General Practice, Monash University

A/Prof Renate Meyer
Department of Statistics, University of Auckland

Dr Tina Skinner
School of Human Movement Studies, The University of Queensland
An interdisciplinary investigation into the relationships between drought and mental health in Australia

Candidate: Jane Rich
Degree: PhD
University: The University of Newcastle
Supervisors: A/Professor Deborah Loxton and Doctor Sarah Wright

In the current context of climate change, weather temperatures and droughts are set to increase in intensity and frequency. It is unclear what the adverse health outcomes might be as a result of this experience. Some research suggests that experiences of drought challenge mental health and wellbeing and there are reports of increases in male suicide rates at that time (Hanigan, Butler, Kokic and Hutchinson 2012). What is not certain is how experiences of drought might affect women’s health and wellbeing.

This public health thesis drew together information from science, health, geography, and sociology to explore the lived experience of drought for three generations of Australian women. The project examined these experiences through three different studies. Firstly, a thematic analysis explored the diversity and breadth of experiences of women in drought. Secondly, a longitudinal analysis qualitatively explored the experiences of drought over time for Australian women and thirdly, three in-depth narratives, from telephone interviews with women, illustrated the connections between the themes, by presenting women’s stories in the wider context of their lives.

Data from the Australian Longitudinal Study on Women’s Health (ALSWH) were analysed in these three studies to explore women’s experiences of drought. This project was particularly interested in the implications of drought on the ageing and wellbeing of women. Data from three age groups of women born between 1973-78, 1946-51 and 1921-26 were included in the analyses. Three separate studies were conducted in each age group, totalling nine different analyses.

The first study conducted a thematic analysis of women’s free-text comments collected by the ALSWH. The aim of this study was to assess drought in the wider context of women’s lives and to examine diversity of experiences. This thematic analysis revealed several important insights. Firstly, there are generational differences in women’s experiences of drought. Secondly, this study revealed the importance of specific events surrounding women and their life in drought, such as raising families, caring for others, and maintaining their health and community involvement. Thirdly, this analysis found that gender was an important aspect of experiences of drought. Many women-specific themes were raised.

The second study aimed to uncover the longitudinal impact of living in drought. This chapter visually mapped each cohort’s survey years and free-text comments to reveal common concepts and themes from the women’s free-text comments. Leximancer software was used to assist in analysis. This study found firstly that a longitudinal lens is vital for drought research. Secondly, this study found that ageing needs to be a vital aspect of drought research. Thirdly, three in-depth narratives, from telephone interviews with women, illustrated the connections between the themes, by presenting women’s stories in the wider context of their lives.

The third study aimed to enable women to tell their story of drought, through telephone interviews. In the narrative analyses the women’s experiences were linked to quantitative health and rainfall data collected by the ALSWH. Results from this study build on the findings of the previous two studies by drawing together women’s reflections and insights. The narratives provide the links and details between themes. Results found that firstly, women have important roles, particularly in caring for their families and husbands during drought. Secondly, ageing was raised as an important theme for each cohort’s narrative. Thirdly, this chapter revealed the incredibly complex experience of drought, drought did not occur in isolation but as part of wider events in life.

This project concluded that drought is a gendered experience. Both gender and ageing must be considered when planning for future droughts.

Calculation of haem iron intake in young women from the Australian Longitudinal Study on Women’s Health and its positive association with iron status

Candidate: Angela Reeves
Degree: Honours
University: The University of Newcastle
Supervisors: Dr Amanda Patterson, Mr Mark McEvoy and Dr Lesley MacDonald-Wicks.

Identifying the main dietary predictors of iron deficiency is important for addressing what is a globally significant nutritional issue. Total iron intake is not strongly associated with iron stores, but limited research suggests haem iron intake may be more predictive. Haem iron is not readily available in most nutrient databases, limiting further research in this area, and in particular, large epidemiological work.

This project aimed to develop a method for measuring haem iron intake in a representative sample of young adult Australian women (25-30 years) and examine its association with self-reported diagnosed iron deficiency over six years of follow-up.

Experimentally determined haem iron contents for Australian red meats, fish and poultry were applied to haem-containing foods included in the Dietary Questionnaire for Epidemiological Studies (DQES) Food Frequency Questionnaire (FFQ). Haem iron intakes were then calculated for 9076 women from the young cohort of the Australian Longitudinal Study on Women’s Health (ALSWH) using the DQES dietary data from the third ALSWH survey (2003). Logistic regression was used to examine the association between haem iron intake (2003) and the incidence of iron deficiency in 2006 and 2009.

Adjusted multivariate logistic regression showed that baseline haem iron intake was a statistically significant predictor of iron deficiency in 2006 (OR: 0.91; 95% CI: 0.84 - 0.99; p-value: 0.020) and 2009 (OR: 0.89; 95% CI: 0.82 - 0.99; p-value: 0.007). Energy adjusted covariate analysis slightly increased the effect size in 2006 (OR: 0.90; 95% CI: 0.84 - 0.99; p-value: 0.020) and 2009 (OR: 0.87; 95% CI: 0.82 - 0.96; p-value: 0.007).

This project concludes that increasing haem iron intake reduces the odds of iron deficiency developing in young adult Australian women.
PROJECT STAFF

The University of Queensland

ALSWH Director
Prof Gita Mishra

Deputy Director /Project Coordinator
A/Prof Leigh Tooth

Principal Research Fellow
A/Prof Deirdre McLaughlin

Research Project Manager
Megan Ferguson

Statisticians
Richard Hockey
Michael Waller

Research Assistants
Janni Leung
Danielle Schoenaker
Megan Barker
Ariel Lackoff
Dr Hsiu-Wen Chen

Research Fellow
Dr Libby Holden

Data Manager - Surveys
David Fitzgerald

Data/Statistical Assistants
Ewan MacKenzie
Carl Holder

Administrative Officers
Katherine De Maria
Leonie Gemmell

The University of Newcastle

Co-Director ALSWH/RCGHA Director
Prof Julie Byles

Deputy Director
A/Prof Deborah Loxton

Research Assistants
Dr Meredith Tavener
Dr Rosie Mooney

Research Fellows
Jennifer Powers
Xenia Dolja-Gore
Sheree Harris
Peta Forder

Operations Manager
Anna Graves

Database Developer
Ryan Tuckerman

Research Assistants
Natalie Townsend
Luke Duffy

Administrative Officers
Melanie Moonen
Clare Thomson

Project Assistant Team Leader
Jenny Helman

Project Assistants
Stephanie Pease
Margaret Jobber
Ellen Monaghan

Casual Project Assistants
Shelby O’Carroll
Sally Rooney
Tatum Dann
Clancy Byles
Tahnee Blacker
Health and wellbeing of women aged 18 to 23 in 2013 and 1996

Findings from the Australian Longitudinal Study on Women’s Health

The ALSWH major report for 2014 described the methods used to recruit the Study’s newest cohort of young women born 1989-95. The report also provided information about the health of the young women recruited, and compared their health with the health of young women of the same age in 1996. Findings of the report are summarised here – the full report is available on the study website.
Recruitment

Recruitment used an innovative new protocol that was effective at reaching this new cohort young women. Rather than sending letters through Medicare, which are largely ignored by this cohort, we used an open recruiting protocol with a strong reliance on social media and invited women to complete an online survey. A total of 17,568 women were recruited, of these 498 were selected to form a pilot group, with a total of 17,070 women forming the 1989-95 cohort.

Representativeness

Representativeness of the cohort enables generalisation of findings from the Study to support the development of national health policy and healthcare planning. Compared with women of the same age in the 2011 Australian Census and the Australian Health Survey (2011-12), the young women in the 1989-95 cohort are representative of women of their age in Australia in terms of age distribution, marital status, and area of residence. There is some over-representation in the cohort of university educated women. This may be in part due to the distinct ALSWH sample frame, which unlike the Census, excluded women who did not have a valid Medicare number.

Sociodemographic characteristics

The cohort displays a good range of diversity of women's backgrounds and social circumstances.

- At recruitment, 23% of women in the cohort had a university degree, and 8% had not completed Year 12. Analysis by age and area of residence showed that higher educational qualifications, especially university level education, were strongly related to age. Level of educational attainment was directly proportional to participation in the labour force. Also, women in major cities were more likely to have higher educational qualifications, particularly university level, than women in regional and remote areas.

- 23% of the women were in a de facto relationship, and 3% were married (similar to the 2011 Census). Compared with women aged 18 to 23 in 1996, contemporary young women were more likely to be in a de facto relationship (23% compared with 12%) and less likely to be married.

- Young women's living arrangements had changed very little from 1996 to 2013 – at both times, a similar proportion of women lived with parents (about half) or lived with partners (about one-quarter).

- 61% of young women in 2013 reported having some level of difficulty managing on their income, compared with 51% of women in the same age group in 1996. Difficulty managing was highest for women with less than Year 12 qualifications, with almost two-fifths of these women finding it impossible or difficult to manage on their income all of the time.

Alcohol consumption

Patterns of alcohol consumption by young women have changed little since 1996, with one in four women (26%) reporting drinking alcohol 'weekly or more frequently' in 2013, compared with 29% in 1996.

- In 2013, around 5% of the cohort consumed an average of more than two standard drinks per day and thirteen per cent engaged in binge drinking (consuming more than four drinks on one occasion) on at least a weekly basis.

- Little variation was evident by sociodemographic characteristics, but women living in remote or very remote areas had the highest prevalence of binge drinking with one in five (22%) doing so weekly or more frequently; 37% of women with university level qualifications reported binge drinking at least monthly.

Tobacco use

Findings from the new cohort provide evidence to support the effectiveness of policies to reduce smoking rates.

- From 1996 to 2013, the percentage of women aged 18 to 23 who had never smoked increased from 53% to 63%, while there was also a substantial decline in the percentage of current smokers from one in three (32%) to less than one in five (19%).

Illicit drugs

- The majority (53%) of the young women had used marijuana, with 30% doing so within the last 12 months. Usage was highest among women with less than Year 12 education (35%) and women living in major cities (32%). Marijuana use peaked at around age 20.

- Other illicit drugs had been used by 29% of the women, with 17% using other illicit drugs within the last 12 months. Usage was highest among women with less than Year 12 education (23%) and women living in remote areas (20%) or in major cities (19%).
Around 70% of the 1989-95 cohort met the Australian threshold recommendation for physical activity. When compared with women of the same age in 2000 (Survey 2 of the 1973-78 cohort), women aged 22 to 23 in 2013 were more physically active - only 30% of women in 2013 were categorised as inactive or having low physical activity, compared with 41% in 2000.

**Being overweight or obese**

Thirty-three per cent of women in the 1989-95 cohort were overweight (19%) or obese (14%), which is a marked increase from 1996, when only 20% of young women were overweight or obese. In 2013, the percentage of overweight and obese women increased with age and area of residence (from the major cities to remote or very remote areas), and was highest among women with less than Year 12 education level.

**Preventive services and screening:**

- Overall more than half the women aged 18 to 23 in 2013 reported having had a Pap test within the last two years, which was slightly more than the percentage of women in the age group in 1996. As expected, use of Pap tests increased with age.
- 86% of women aged 18 to 23 in 2013 reported that they had their blood pressure checked, and 30% of women reported having their skin checked for “spots, lesions, moles.”
- Women aged 18 to 23 in 2013 were eligible for the free HPV vaccination program at school when it was introduced in 2007. However, only 83% reported they had ever been vaccinated for HPV, with little variation by area of residence.
- Reporting of HPV vaccination was lowest among the 18 year olds (78%) and highest among those aged 21 or more (85-86%). It was lowest among those with the lowest levels of educational attainment.

**Psychological distress**

Young adulthood is characterised by many social, educational, occupational and residential changes that in some, can lead to high levels of psychological distress.

- Levels of psychological stress reported by young women were higher in 2013 than in 1996. In 2013, distress was higher (55%) for the younger women aged 18 to 20 than for women aged 21 to 23 (45%), suggesting that distress is associated with psychological pressures experienced during the transition from adolescence to young adulthood.
- Over half (59%) of the new cohort reported at least one episode of suicidal thoughts and 45% reported self-harm.
- Many women had sought professional help to improve their mental health, with about a third reporting they had been diagnosed with or treated for either depression or anxiety.
- Across all mental health measures, women with less than a Year 12 education or those with a certificate or diploma qualification were more likely to report poor mental health.

**Violence**

Levels of physical and sexual violence were similar for young women in 2013 and 1996.

- In 2013, almost one in five women (19%) had experienced physical or sexual violence in the last 12 months, and more than half (56%) had experienced physical or sexual violence at some stage in their lives – for women with less than Year 12 education the prevalence was 77%.
- Bullying had been experienced in the last 12 months by almost one in five women (18%), and by 70% of women at some stage in their lives.
- The prevalence of Intimate Partner Violence increased across the age range and was more prevalent outside major cities.
- 45% of the women reported some form of current or past abuse, with 12% reporting one form of abuse, 8% two forms and 25% reporting three or more forms of abuse.

**Physical activity**

**Physical health**

- Nearly one-third of young women had been diagnosed with low iron, and a quarter had been diagnosed with asthma.
- More than one in five reported frequent experience of severe tiredness (29%), back pain (21%), headaches or migraines (23%), irregular periods (20%), or severe period pain (22%).
- The number of young women reporting difficulty in sleeping (25%), back pain (21%), vaginal discharge or irritation (11%), haemorrhoids (2%), constipation (6%) and other bowel problems (5%), had doubled since 1996.

**Sexual and reproductive health**

- The pill and condoms were the main forms of contraception used by women aged 18 to 23 in 2013.
- Women with less than Year 12 educational attainment were more likely to report not using contraceptives the last time they had sex (27%) compared with women with higher qualifications (7-15%).
- Contraceptive use was reported by a higher percentage of women living in major cities and those with Year 12 or university qualifications.
- There remain marked variations in the percentage of women who reported ever having been pregnant according to age, area of residence and education level: 21% of women aged 23, 24% of women living in remote or very remote areas, and 41% of those with less than Year 12 qualifications reported ever having been pregnant.

**Access to health services**

- Women's preference for a female doctor was different for different age groups within the cohort but there was little difference between women aged 18 to 23 in 2013 and in 1996.
- 78% of women aged 18 to 23 in 2013 reported doctors as a source of information, with a similar figure across the age range, area of residence, and education level.
- 62% of women identified family members as a source of health information; however, there was a clear decline in the percentage with age and was lowest among those who had not completed Year 12 qualifications.
- 44% of the women identified the internet as a source of health information; the percentage was higher among those living in the major cities than elsewhere, increased with age (37% at 18 to 49% at age 23 years) and was higher among those with higher levels of education.
- Overall 69% of women had their own Medicare card while 13% had a copy of a parent's card and 18% had to borrow their parents' card.

**Summary**

The 2014 major report gives an overview of the recruitment of a large cohort of young women to the Australian Longitudinal Study on Women's Health. While there are some minor differences between women recruited and the Australian population of women of the same ages, the cohort is still broadly representative of the general population. It also presents a diversity of backgrounds and circumstances, which will allow continued assessment of a wide range of factors associated with women's health - a major aim of the Study. Young women in the new cohort are not dissimilar to women of the same age in 1996, but they are more physically active and appear to have higher levels of psychological stress. Over time we expect to see rapid changes in young women's social circumstances, health risks, health, and health care use which will provide new understandings of what influences the health of young women in the 21st Century.
In 2014, summary reports have been provided on the 1973-78 and 1921-26 cohorts, outlining the health trajectories and key issues for each cohort since the beginning of the study. Major research findings are also reported. Highlights from each summary are presented here—the full reports are available on the website.
The cohort has been surveyed six times since 1996 - details of survey dates and response rates are shown in Table 1.

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<tbody>
<tr>
<td>Age 18-23</td>
<td>Age 22-27</td>
<td>Age 25-30</td>
<td>Age 28-33</td>
<td>Age 31-36</td>
<td>Age 34-39</td>
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<tr>
<td>N = 14,247</td>
<td>N = 9,688</td>
<td>N = 9,081</td>
<td>N = 9,145</td>
<td>N = 8,200</td>
<td>N = 8,010</td>
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Surveys have covered the main issues affecting the health of contemporary young women, with questions selected to reflect national health and social policy concerns, and to add to knowledge of women's well-being during this stage of the life-span. Topics have included:

- Education, employment, household composition and other sociodemographic factors
- Nutrition, physical activity, smoking, alcohol and other health behaviours and risk factors
- Contraception, childbirth, fertility problems and other reproductive health issues
- Mental health - including depression and anxiety
- Physical health - including diseases, chronic conditions, symptoms and health related quality of life (including health related quality of life, diseases, conditions, symptoms)
- Use of health services, such as GPs, specialists and hospitals
- Ease of access to health services and satisfaction with services
- Time use (including paid and unpaid work, family roles, leisure)
- Interpersonal violence

Selected health trajectories from Survey 1 to Survey 6

Over the survey period, there has been a marked increase in weight (Figure 1) and a concomitant increase in the percentage of women whose BMI was within the overweight or obese categories, from 20% at Survey 1 to around 45% by Survey 6. A small percentage of women reported being underweight at Survey 1 and this fell steadily over the five subsequent surveys.

Methods of contraception have also changed over the survey period, with use of the contraceptive pill and condoms decreasing as other forms of contraceptive (e.g., long acting reversible contraceptives) became available and more popular (Figure 3).

Major research outputs

Since 2001, data from surveys of the 1973-78 cohort have been used in more than 30 reports prepared for the Australian Government Department of Health and other Government agencies, and more than 125 published papers. The major themes covered have been mental health, reproductive health, weight, nutrition, and physical activity, chronic conditions, and health service use. Findings from the 1973-78 cohort have also directly influenced Federal and State Government policy. Recent contributions of note include the 2010 Australian Government National Women's Health Policy 2014 Australian Government Physical Activity Guidelines and the 2013 New South Wales Government's Health Framework for Women's Health.

Key issues

ALSWH findings from the 1973-78 cohort have contributed to identifying national priorities for research on the health of young women, including:

- How to increase participation by young women in healthy lifestyle behaviours such as reduced sitting time, increased physical activity, less caloric consumption, maintenance of healthy body weight, and reduced smoking and risk taking behaviour concerning drugs and alcohol.
- How to optimally utilise the internet, in particular social media, to increase young women's awareness of health issues and healthy behaviour practices.
- Identifying domestic violence and abuse before it becomes detrimental to young women's health.
- Identification of ways to reduce young women's risk of sexually transmitted infections and risky health behaviours which, if not identified and treated early enough, can impact on future fertility.
- Early identification of mental health issues and ways to promote early treatment.
- How to assist young women manage and balance work and family commitments so as to minimise negative impacts on mental and physical health.
Future data collection from the 1973-78 cohort and from the newest cohort of young women (born 1989-95) will allow ALSWH to continue providing unparalleled data on the early predictors of many health outcomes, as well as supporting the development of health policy, and informing the type, timing, and targeting of preventive health initiatives and health services.

Surveys have included questions on a broad range of health-related themes, including:

- Physical, social and emotional functioning (SF-36 Health related quality of life measure)
- Degree of difficulties with activities of daily living and need for assistance with activities of daily living
- Sight and hearing difficulties
- Falls
- Physical activity, height and weight
- Demographics and living circumstances

The percentage of women who rated their health as fair or poor increased from 27% at age 70 to 75 years to 45% by age 85 to 90 years. Derived from a series of standard questions that assess health-related quality of life, the two main sub-scales showed only a slight decline for the mean score for mental health that contrasted with a marked decline in the mean score for physical functioning.

The change in self-rated health and physical functioning was reflected in increases in the percentage of women reporting high blood pressure, diabetes, heart disease, and those who reported having had a stroke (see Figure 4). The percentage of those with osteoporosis and arthritis also increased over the survey period (Figure 4).

The decline in health was also in line with increases in GP consultations, with the percentage of women who consulted their GP more than 12 times over the previous year rising from 15% to 20%.

**Functional abilities and caring**

The percentage of women who reported needing help from others for daily tasks due to long-term illness rose fourfold, from 8% at age 70 to 75 years to 34% by age 87 to 92 years. This was also evident in the increase of scores that assess difficulties with activities of daily living (such as dressing and bathing) and instrumental activities of daily living (such as cooking and driving).

Women were also likely to be caring for others because of that person’s illness or disability. At age 70-75, women were twice as likely to be caring for someone else (17%) than needing care for themselves. By Survey 6, this ratio was reversed, with around 10% of women aged 85-90 years caring for another person. The percentage of women who reported providing care for children on at least an occasional basis declined from 45% at age 73 to 78 years to 14% at 85 to 90 years.

**Health and health service use**

The oldest ALSWH cohort was surveyed six times between 1996 and 2011. Since November 2011 they have been surveyed every six months. Survey dates and response rates are shown in Table 2 and Table 3.

**Table 2 ALSWH 1921-26 cohort - schedule of surveys and response rates 1996 - 2011**

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<tbody>
<tr>
<td>Age 70-75</td>
<td>Age 73-78</td>
<td>Age 76-81</td>
<td>Age 79-84</td>
<td>Age 82-87</td>
<td>Age 85-90</td>
<td></td>
</tr>
<tr>
<td>N=12,432</td>
<td>N=10,434</td>
<td>N=8,647</td>
<td>N=7,158</td>
<td>N=5,661</td>
<td>N=4,056</td>
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**Table 3 ALSWH 1921-26 cohort six-month follow-up survey completions (2011 – 2013)**

<table>
<thead>
<tr>
<th>6MF 1 (November 2011)</th>
<th>6MF 2 (May 2012)</th>
<th>6MF 3 (November 2012)</th>
<th>6MF 4 (May 2013)</th>
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<tbody>
<tr>
<td>Mailed</td>
<td>4,707</td>
<td>3,754</td>
<td>2,750</td>
</tr>
<tr>
<td>Respondents</td>
<td>3,839 (82%)</td>
<td>3,353 (89%)</td>
<td>2,894 (89%)</td>
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Data from earlier surveys highlight that most older women are in good, very good or excellent health during their 70% and early 80%, and are able to live...
Increasing needs for health care are illustrated by the increasing number of general practitioner visits over successive time points. However, it must be noted that women with the greatest need for health service use are more likely to have died over the course of the study. There is also a suggestion of a potential inequity in access to GP services at the oldest ages, although this requires more thorough investigation.

Healthy behaviours including nutrition and physical activity are key drivers of health in older age. This cohort entered adulthood prior to the global rise in the incidence of obesity. Few women were obese, and women’s BMI tended to decrease over time. Underweight is a potential issue for this cohort, particularly as they age and may represent a loss of lean body mass and poor nutrition. Moreover, underweight women are less likely to have survived and are less likely to be included in the later surveys. Increasing levels of physical inactivity may exacerbate these nutritional problems, resulting in poor appetite as well as loss of muscle strength. Physical activity programs for older people can be tailored to their functional capacity, and can help improve strength and balance, reduce falls and improve independence and overall wellbeing.

As the cohort ages, fewer women are able to drive themselves, and they are more likely to be reliant on public transport. Lack of transport options limit women’s ability to provide care, participate in social activities, and seek health care. Access to convenient, affordable and safe transport and appropriate community designs contribute to age friendly environments which can promote social integration and physical health.

The changes in women’s health demonstrated in this summary provide important information for understanding the pace of change in the development of health conditions, increasing levels of disability and increasing needs for health and social care and other forms of instrumental support. Self-reporting of conditions on the surveys has been validated against hospital records with good agreement for conditions such as arthritis, moderate agreement for cardiovascular disease, and poor agreement for stroke. Reports of osteoporosis are dependent on access to bone densitometry which is indicated for women over age 70. Increasing reporting of osteoporosis over the study period will reflect both true increases in prevalence as well as increases in diagnoses of pre-existing conditions.

Supportive environments for older people include neighbourhoods, housing and transport. ALSWH data show how the women transition from living in a house, to living in a unit, retirement village or aged care facility. These changes in housing mirror changes in marital status from being more likely to be married to more likely to be widowed and may also correspond to increasing needs for assistance in activities of daily living. Women may also have moved to be near family, and in so doing allow themselves to have a greater role in caring for grandchildren as well as receiving care for themselves. Appropriate housing for older people has been identified as a critical factor in maintaining functional independence and community participation. Many women would have sold their houses to move to other accommodation, unlocking housing for other parts of the community and releasing the equity to provide for other needs. Appropriate housing is also essential for the delivery of aged care and in keeping with policies for ageing in place.

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Diet quality score is a predictor of type 2 diabetes risk in women: The Australian Longitudinal Study on Women’s Health. British Journal of Nutrition, 2014; 112(06), 945-951.

Methods: Nineteen women from the Australian Longitudinal Study on Women's Health (ALSWH) who were free of diabetes and completed FFQ at baseline. The associations between the ARFS and DGI were assessed using multiple logistic regression models, adjusting for sociodemographic characteristics, lifestyle factors and energy intake. During 6 years of follow-up, 311 incident cases of type 2 diabetes were reported. The DGI score was inversely associated with type 2 diabetes risk (OR comparing the highest with the lowest quintile of DGI was 0.51; 95% CI 0.35, 0.76; P for trend = 0.01). There was no significant association between the ARFS and type 2 diabetes risk (OR comparing the highest with the lowest quintile of ARFS was: 0.99; 95% CI 0.68, 1.43; P for trend = 0.42).

Results: Women reported a number of problems with the information about alcohol use during pregnancy and with its dissemination. There were inconsistencies in the information about alcohol use during pregnancy and in the advice provided. Mixed messages and confusion about identifying a safe level of consumption had implications on women's decisions to drink or abstain during pregnancy. Women expressed a need for a clear, consistent message to be provided to women as early as possible. They preferred that the message come from healthcare professionals or another reputable source.

Conclusions: To make an informed decision about alcohol use during pregnancy, women must first be provided with the latest evidence-based information. As this study found a number of limitations with information provision, it is suggested that a systematic approach be adopted by healthcare professionals, in line with best-practice guidelines, to ensure all women are made aware of the alcohol recommendations for pregnancy.


Background: Risky patterns of alcohol use prior to pregnancy increase the risk of alcohol-exposed pregnancies and subsequent adverse outcomes. It is important to understand how consumption changes once women become pregnant.

Methods: A sample of 1577 women from the 1973–78 cohort of the Australian Longitudinal Study on Women's Health were included if they first reported being pregnant in 2000, 2003, 2006, and 2009 and reported risky drinking patterns prior to that pregnancy. Multinomial logistic regression was used to determine which risky drinking patterns were most likely to continue into pregnancy. Results: When reporting risky drinking patterns prior to pregnancy, only 6% of women reported weekly drinking only, whereas 46% reported binge drinking only and 48% reported both. Women in both binge categories were more likely to have experienced financial stress, not been partnered, smoked, used drugs, been nulliparous, experienced a violent relationship, and were less educated. Most (54%) continued these risky drinking patterns into pregnancy, with 40% reducing these behaviors, and 14% completely ceasing alcohol consumption. Once pregnant, women who bingeed only prior to pregnancy were more likely to continue (55%) than reduce drinking (29%). Of the combined drinking group 61% continued to binge and 47% continued weekly drinking. Compared with the combined drinking group, binge only drinkers prior to pregnancy were less likely to reduce rather than continue their drinking once pregnant (OR = 0.37, 95% CI 0.29, 0.47).

Conclusions: Over a third of women continued risky drinking into pregnancy, especially binge drinking, suggesting a need to address alcohol consumption prior to pregnancy.


Background: Recent estimates suggest that high body mass index (BMI), smoking, high blood pressure (BP) and physical inactivity are leading risk factors for the overall burden of disease in Australia. The aim was to examine the population attributable risk (PAR) of heart disease for each of these risk factors, across the adult lifespan in Australian women.

Methods: PARs were estimated using relative risks (RRs) for each of the four risk factors, as used in the Global Burden of Disease Study, and prevalence estimates from the Australian Longitudinal Study on Women's Health, in 15 age groups from 22–27 (N=9608) to 85–90 (N=3901).

Results: RRs and prevalence estimates varied across the lifespan. RRs ranged from 6.15 for smoking in the younger women to 1.20 for high BMI and high BP in the older women. Prevalence of risk exposure ranged from 2% for high BP in the younger women to 79% for high BMI in mid-age women. In young adult women up to age 30, the highest population risk was attributed to smoking. From age 31 to 90, PARs were highest for physical inactivity.

Conclusions: From about age 30, the population risk of heart disease attributable to inactivity outweighs that of other risk factors, including high BMI. Programmes for the promotion and maintenance of physical activity deserve to be a much higher public health priority for women than they are now, across the adult lifespan.


Background: Although many people survive an initial stroke, little is known about long-term impacts of stroke on survival. Methods: Data from the Australian Longitudinal Study on Women’s Health (ALWH) were used to compare 12-year survival rates in older women with prevalent stroke, incident stroke, and no stroke. Cox regression models were fitted to assess the effect of lifestyle and demographic characteristics on the relationship between stroke and all-cause mortality. The “no stroke” group was used as the reference category in all statistical models.

Results: At baseline, 6% of the women reported a previous stroke (prevalent stroke). At survey 2 in 1999, a further 3% reported having a stroke between 1996 and 1999 (incident stroke). Stroke was significantly associated with reduced long-term survival. Age-adjusted hazards ratios (HRs) were: 1.64 (1.43-1.89) for the “prevalent stroke” group and 2.29 (1.97-2.66) for the “incident stroke” group. Adjusting for comorbidities reduced the HRs, but the risk of death was still significantly higher in the 2 stroke groups. Adjusting for demographic and lifestyle factors did not make any further difference to the relationship between stroke and survival. However, obesity and past smoking were also risk factors for mortality.

Conclusions: This study highlights the long-term impacts of stroke on life expectancy and the importance of comorbidities and other lifestyle factors in affecting post stroke survival.

54 papers using ALSWH data were published or accepted for publication in national and international scientific journals during 2014.
Objective: To examine the factors related to Papanicolaou (Pap) tests, mammography and cholestrol testing in mid-aged Australian women as they age.

Methods: Data were obtained from the 1946–51 cohort of the Australian Longitudinal Study on Women’s Health, a prospective study of the health and lifestyle of Australian women. Data were collected via self-report mailed surveys on a three-yearly basis since 1996, when participants were aged 45–50. Demographic factors, health service use and health-related factors were examined in relation to screening practices in a lagged analysis.

Results: As women aged, they were less likely to have a Pap test and more likely to report having a mammogram and a cholestrol test. Smokers were less likely to have all screening tests, and HRT use and more general practitioner (GP) visits were associated with increased odds of having health checks. Compared to healthy weight, higher BMI was associated with increased odds of cholestrol testing but decreased odds for Pap testing; obese women had lower odds for mammography and Pap testing. Worse self-rated health and self-report of a chronic condition were significantly related to increased likelihood of cholestrol testing. While some demographic and area of residence factors were also significantly associated with screening, large inequities based on socioeconomic status were not evident. Conclusions: Health and healthcare use are important determinants of screening.

Implications: Greater advantage needs to be taken of opportunities to encourage women with more health risk behaviours and health problems to engage in screening.


While grief, emotional distress and other mental health conditions have been associated with pregnancy loss, less is known about the mental health impact of these events during subsequent pregnancies. This paper examined the impact of any type of pregnancy loss on mental health in a subsequent pregnancy and postpartum. Data were obtained from a sub-sample (N = 584) of the 1973-78 cohort of the Australian Longitudinal Study on Women's Health, a prospective cohort study that has been collecting data since 1996. Pregnancy loss was defined as miscarriage, termination due to medical reasons, ectopic pregnancy and stillbirth. Mental health outcomes included depression, anxiety, stress or distress, sadness or low mood, excessive worry, lack of enjoyment, and feelings of guilt. Demographic factors and mental health history were controlled for in the analysis. Women with a previous pregnancy loss were more likely to experience sadness or low mood (AOR = 1.75, 95% CI: 1.11 to 2.76, p = 0.0162), and excessive worry (AOR = 2.01, 95% CI: 1.24 to 3.24, p = 0.0043) during a subsequent pregnancy, but not in the postpartum phase following a subsequent birth. These results indicate that while women who have experienced a pregnancy loss are a more vulnerable population during a subsequent pregnancy, these deficits are not evident in the postpartum.


Objective: To examine changes in sitting time (ST) in women over nine years and to identify associations between life events and these changes.

Methods. Young (born 1973–78, n = 5215) and mid-aged (born 1946–51, n = 6973) women reported life events and ST in four surveys of the Australian Longitudinal Study on Women’s Health between 2000 and 2010. Associations between life events and changes in ST between surveys results. Against a background of complex changes there was an overall decrease in ST in young women (median change –0.48 h/day, interquartile range [IQR] = –2.54, 1.50) and an increase in ST in mid-aged women (median change 0.43 h/day; IQR = –1.29, 2.00) over nine years. In young women, returning to study and job loss were associated with increased ST, while having a baby, beginning work and decreased income were associated with decreased ST. In mid-aged women, changes at work were associated with increased ST while returning home and decreased income were associated with decreased ST. Conclusions. ST changed over nine years in young and mid-aged Australian women. The life events they experienced, particularly events related to work and family, were associated with these changes.


Objective: To determine if associations exist between a range of unsaturated fatty acid intakes and mental health outcomes.

Design: Cross-sectional data analysis of the Australian Longitudinal Study on Women’s Health (ALSWH) Young Cohort Survey 3 that included the validated seventy-four-item Dietary Questionnaire for Epidemiological Studies FFQ, validated mental health scales and self-report questions on depression and anxiety.

Subjects: A nationally representative sample of young Australian women (25-30 years) from ALSWH. The 7635 women with plausible energy intakes (>45 but <2000 MJ/d) were included in the analyses.

Results: Adjusted logistic regression analyses found statistically significant associations between higher intakes of α-linolenic acid and decreased likelihood of depressive symptoms indicated by the ten-item Center for Epidemiological Studies Depression Scale (CESD-10; OR=0.77, 95 % CI 0.60, 0.99; P=0.040) and the Short Form Health Survey (SF-36) mental health subscale [OR=0.73 95 % CI 0.56, 0.96; P=0.024]. Furthermore, higher intakes of n-6 fatty acids (OR=0.96, 95 % CI 0.91, 0.99; P=0.019) and linoleic acid (OR=0.96, 95 % CI 0.93, 0.99; P=0.020) were associated with decreased likelihood of self-reported diagnosed anxiety and higher intakes of n-9 fatty acids (OR=1.02, 95 % CI 1.00, 1.04; P=0.041) and oleic acid (OR=1.02, 95 % CI 1.00, 1.05; P=0.046) were associated with increased likelihood of self-reported diagnosed anxiety.

Conclusions: Increased intakes of α-linolenic acid were associated with a reduced likelihood of depressive symptoms, increased intakes of n-6 fatty acids and linoleic acid were associated with a reduced likelihood of self-reported diagnosed anxiety and increased intakes of n-9 fatty acids and oleic acid were associated with an increased likelihood of anxiety. Additional studies are needed to further elucidate associations between unsaturated fatty acids and depression and anxiety.


Background: Arthritis is a significant contributor to illness, pain and disability and imposes a considerable burden on the community. Pain is a cardinal symptom in arthritis and has significant implications on biopsychosocial wellbeing. The multidimensional nature of the experience of pain in arthritis has not been well defined in community-based samples.

Aims: The two aims of this study are to generate profiles of pain from a community sample of older women and to compare profiles for women with and without arthritis.

Methods: The sub study is a cross-sectional postal survey of 7090 community-dwelling women. The study includes a range of measures on health, arthritis and pain that will be used to examine the multidimensional nature of the experience of pain in arthritis and generates profiles of pain.

Discussion: With no core set of measures for the evaluation of arthritis pain, this survey was created from an amalgamation of measures to capture multiple dimensions of pain. Findings from this study will assist in defining the symptom of pain in arthritis and may lead to further research in evidence-based treatment options for people with arthritis.

Dixon S, Herbert D, Loxtorn D & Lucke J. ‘As many options as there are, there are just not enough for me’: Contraceptive use and barriers to access among Australian women. The European Journal of Contraception and Reproductive Health Care, 2014; 19(5), 340-351.

Objective: A comprehensive life course perspective of women’s experiences in obtaining and using contraceptives in Australia is lacking. This paper explores free-text comments about contraception provided by women born between 1973 and 1978 who participated in the Australian Longitudinal Study on Women’s Health (ALSWH).

Methods: The ALSWH is a national population-based cohort study involving over 40,000 women from three age groups, who are surveyed every three years. An initial search identified 1600 comments from 690 women across five surveys from 1996 (when they were aged 18–23 years) to 2009 (31–36 years). The analysis included 305 comments from 289 participants. Factors related to contraceptive access and options for contraceptive use were identified and explored using thematic analysis.

Results: Five themes recurred across the five surveys for women aged: (i) side effects affecting physical and mental health; (ii) lack of information about contraception; (iii) negative experiences with health services; (iv) contraceptive failure; and (v) difficulty with accessing contraception.

Conclusion: Side effects of hormonal contraception and concerns about contraceptive failure influence women’s mental and physical health. Many barriers to effective contraceptive use persist, but women’s reproductive lives. Further research is needed into reducing barriers and minimising negative experiences, to ensure optimal contraceptive access for Australian women.


This study examines differences in uptake of the Medicare items rolled out in 2006 under the ‘Better Access Scheme’ (BAS) between rural and non-rural Australian women. It compares differences in women’s uptake of the BAS services by area of residence (ARIA+) across time using...
the Australian Longitudinal Study of Women’s Health (ALSWH) survey data linked to Medicare data. Women aged 28-33 years at the time the BAS was introduced that responded to the self-reported question on depression/anxiety and consented to linkage of their survey data with Medicare data (n = 4316). Participants were grouped by ARIA+ according to BAS use, diagnoses of anxiety/depression but no BAS use and other eligible women. Across all areas, women born 1973-1978 had better response rates to questions on depression/anxiety or having treatment under the BAS had a significantly lower mean mental health score compared to other women. Significantly more women living in non-rural areas had used at least one service provided under the BAS initiative compared to women in urban areas who have a diagnosis of depression/anxiety but not been treated under the BAS. While there is a gradual uptake of the new BAS services, a large percentage of women who have a diagnosis of depression/anxiety have not been treated under the BAS. The data suggest that women in rural areas have been better able to take up the services compared to non-urban women.

Frawley J, Adams J, Steel A, Broom A, Gallois C & Sibbritt D. 
Majority of women are influenced by non-professional information sources when deciding to consult a complementary and alternative medicine (CAM) practitioner during pregnancy. Journal of Alternative and Complementary Medicine, 2014; 20(7), 1-7.

Objectives: Up to 67% of women are using some form of complementary and alternative medicine (CAM) during their pregnancy, and this study was conducted to investigate the information sources that these women find influential in relation to such use.

Design: The study sample was obtained via the Australian Longitudinal Study on Women's Health. This article is based on a sub-study of 1383 pregnant women who were surveyed in 2010. The women answered questions about CAM use, pregnancy-related health concerns, and influential information sources in relation to CAM use. Logistic regression models were used to determine the information sources that women find influential in their decision making regarding CAM use.

Results: Of the respondents (n=1383, 79.2% response rate), 48.1% (n=623) of the pregnant women consulted a CAM practitioner and 91.7% (n=1485) used a CAM product during pregnancy. The results show that, of the women who half (46.8%, n=693) were influenced by their own personal experience of CAM and 43% (n=423) by family and friends. Other popular sources of information were general practitioners 27% (n=263), the media (television, radio, books, magazines, newspapers) 22% (n=220), obstetricians 21% (n=208) and midwives 19% (n=190). Numerous statistically significant associations between influential information sources and pregnancy-related health conditions were identified.

Conclusions: Women utilize a wide variety of information sources regarding their CAM use during pregnancy. Nonprofessional sources of information were found to be particularly influential, and maternity health care professionals need to have a nonjudgmental and open discussion with women about their CAM use during pregnancy in order to ensure safe and effective maternal outcomes.


Purpose: The influence of social support on health and quality of life has been well documented. There is less evidence on whether health status affects social support, and little is known about the scale relationship between social support and health in early adulthood. This study investigates these associations using both concurrent and time-lagged measures at 5 time-points over 12 years during early adulthood.

Methods: A population-based cohort of 9,758 young women from the Australian Longitudinal Study on Women’s Health was used. Women were aged 22–27 in 2000 and 35–39 in 2012. The General Health subscale of the SF-36 and the MOS Social Support Survey 6-item Scale were used, with scores standardised to a range of 0–100.

Longitudinal tobit models were used, because both social support and general health were skewed, with marked ceiling effects. All models were adjusted for status of the outcome of interest at the immediately previous survey.

Results: With both concurrent and time-lagged measures, there was a statistically significant difference in mean general health scores across social support quintiles after adjusting for demographic and behavioural covariates: lower general health was associated with lower social support. In reverse, social support mean scores were also significantly different across general health quintiles in both concurrent and time-lagged fully adjusted models.

Conclusion: Social support is significantly associated with both current and subsequent general health in early adulthood. The significance of the reverse associations indicates that the two mutually influence each other. This study highlights the importance of social support as a health-related quality of life issue.


Purpose: This study aimed to validate a 6-item 1-factor global measure of social support developed from the MOS-Social Support Survey (MOS-SSS) for use in large epidemiological studies.

Methods: Data were obtained from two large population-based samples of participants in the Australian Longitudinal Study on Women’s Health. The two cohorts were aged 33–38 and 38–43 at data collection (n = 10,616 and 8,977, respectively). Items selected for the 6-item 1-factor measure were derived from the factor structure obtained from unpublished work using an earlier wave of data from one of these cohorts. Descriptive statistics, including polychoric correlations, were used to describe the abbreviated scale. Cronbach’s alpha was used to assess internal consistency and confirmatory factor analysis to assess scale validity. Concurrent validity was assessed using correlations between the new 6-item version and established 19-item version, and other concurrent variables.

Results: In both cohorts, the new 6-item 1-factor measure showed strong associations between scale and social support. It had excellent goodness-of-fit indices, similar to those of the established 19-item measure. Both versions correlated similarly with concurrent measures.

Conclusion: The 6-item 1-factor MOS-SSS measures global functional social support with fewer items than the established 19-item measure.


Background: Limited evidence exists about the role of education and own educational mobility on body weight trajectory. A better understanding of how education influences long term weight gain can help us to design more effective health policies.

Methods: Using random effects models, the association between i) highest education (n = 10 018) and ii) educational mobility over a 9 year period (n = 9 907) and weight gain was analysed using five waves of data (ages 13 years) from the Australian Longitudinal Study on Women’s Health 1973–78 cohort (from 18–23 years to 31–36 years).

Results: Highest educational attainment was inversely associated with weight at baseline and weight gain over 13 years. Compared to high educated women, those with a low (12 years or less) or intermediate (trade/
Contraception use and pregnancy outcomes in women with polycystic ovary syndrome: Data from the Australian Longitudinal Study on Women’s Health. Human Reproduction, 2014; 29(4), 802-808.

Study question: Do contraception use, pregnancy outcome and number of children differ in women with and without polycystic ovary syndrome (PCOS)?

Summary answer: Women with PCOS were less likely to report use of contraception and more likely to report a miscarriage, whilst number of children was similar between groups.

What is known already: The oral contraceptive pill is used in the management of PCOS, but the patterns of contraceptive use in women with PCOS is not known. In women who have undergone assisted reproduction, the risk of pregnancy loss appears higher, yet pregnancy loss and family size among community-based women with PCOS is not known.

Study design, size and duration: This is a cross-sectional analysis of a longitudinal cohort study. Mailed survey data were collected at five time points (years 1996, 2000, 2003, 2006 and 2009). Data from respondents to Survey 4 (2006), aged 28–33 (n = 9145, 62% of the original cohort aged 18–23 years) were analysed.

Participants/materials, settings, methods: This study was conducted in a general community setting. Data from participants who responded to the questions on contraceptive use, contraception and pregnancy outcome were analysed. The main outcome measures were self-reported PCOS, body mass index (BMI), contraception use, pregnancy loss and number of children.

Main results and the role of chance: In women aged 28–33 years, women with PCOS were less likely to be using contraception (61% versus 79%, P < 0.001) and more likely to be trying to conceive (56 versus 45%, P < 0.001), compared with women not reporting PCOS. A greater proportion of women with PCOS reported pregnancy loss (20 versus 15%, P = 0.003). PCOS was not independently associated with pregnancy loss; however, BMI was independently associated with pregnancy loss in the overweight and obese groups (OR 1.2, 95% CI 1.04–1.4, P = 0.02 and OR 1.4, 95% CI 1.1–1.6, P = 0.001, respectively). Fertility treatment use was also independently associated with pregnancy loss (adjusted OR 3.2, 95% CI 2.4–4.2, P < 0.001). There was no significant difference in number of children between women with and without PCOS.

Limitations, reason for caution: PCOS, contraception use and pregnancy outcome data were self-reported. Attrition occurred, but is reasonable compared with similar longitudinal cohort studies.

Wider implications of the findings: This community-based cohort aged 28–33 years provides insights into the contraceptive use, pregnancy loss and family size of a large cohort of unselected women. Women reporting PCOS had lower rates of contraception use and were more likely to be currently trying to conceive, suggesting that they may be aware of potential fertility challenges, yet in those not planning to conceive, contraceptive use was low and further education may be required. Despite prior reports of higher rates of pregnancy loss in PCOS, usually from infertility services, in this community-based population, PCOS was not independently associated with pregnancy loss, yet independent risk factors for pregnancy loss included higher BMI, were higher in PCOS. The number of children per woman was similar in both the groups, albeit with more infertility treatment in PCOS. This may reas to why PCOS that with access to fertility treatment, family sizes appear similar to women not reporting PCOS.


Context: Polycystic ovary syndrome (PCOS) affects 6–21% of women. PCOS has been associated with an increased risk of dysglycaemia including gestational diabetes (GDM) and type 2 diabetes (T2DM). Objective: To assess the prevalence of dysglycaemia and the impact of obesity in young reproductive-aged women with and without PCOS in a community-based cohort.

Design: Cross-sectional analysis of data from a large longitudinal study (the Australian Longitudinal Study on Women’s Health (ALSWH)). Participants: Women were randomly selected from the national health insurance database. Standardised data collection was held at 5 survey time points (years 1996, 2000, 2003, 2006 and 2009). Data from survey 4 (n=9145, 62% of original cohort aged 18 to 23 years) were examined for this study. Main outcome measures: Self-reported PCOS, GDM and T2DM Results: In women aged 28 to 33 years, PCOS prevalence was 5.8% (95% CI: 5.3%-6.4%). The prevalence of GDM (in women reporting prior pregnancy) and T2DM was 11.2% and 5.1% in women with PCOS and 3.8% and 0.3% in women without PCOS respectively (p for both<0.001). PCOS was associated with increased odds of GDM and T2DM. After adjusting for age, Body Mass Index (BMI), hypertension, smoking and demographic factors, the odds of GDM (OR 2.1, 95% CI 1.3-3.9, p=0.002) and T2DM (OR 8.8, 95% CI 3.9-20.1, p<0.001) remained increased in women reporting PCOS.

Conclusions: In a large community-based cohort of reproductive-aged women, PCOS was independently associated with higher risk of GDM and T2DM, independent of BMI. Aggressive screening, prevention and management of dysglycaemia is clearly warranted in women with PCOS.


Women’s work and family choices are affected by social pressures and external constraints. Understanding young women’s aspirations for future work and family is important for understanding their future needs and for developing supportive work–family practices and policies. Despite criticism, Lifestyle Preference Theory has been argued to explain women’s life choices, and historically has been used to inform Australian policy. We add two additional issues: whether Lifestyle Preference Groups are consistent with young Australian women’s stated preferences; whether aspirations are consistent over time; and whether women’s later lives are consistent with their earlier stated preferences. Using four waves of data from the Australian Longitudinal Study on Women’s Health (ALSWH), young women’s work and family aspirations were investigated cross-sectionally and longitudinally. Most aspired to both paid work and family; most changed their preferences over time; and the fit between preferences in 2000 and lifestyle in 2009 was modest. Lifestyle Preference Theory was not an adequate fit to the data.


Background: Graphical techniques can provide visually compelling insights into complex data patterns. In this paper, we present a non-linear lagged plot showing changes in categorical variables for participants measured at regular intervals over time and propose statistical models to estimate distributions of marginal and transitional probabilities.

Methods: The plot uses stacked bars to show the distribution of categorical variables at each time interval.
with different colours to depict different categories and changes in colours showing trajectories of participants over time. The models are based on nominal logistic regression and were applied for both ordinal and nominal categorical variables. To illustrate the plots and models we analyse data on smoking status, body mass index (BMI) and physical activity level from a longitudinal study on women’s health. To estimate marginal distributions we fit survey data as a random effect variable whereas for transitional distributions we fit status of participants (e.g. smoking status) at previous surveys. Results: For the illustrative data the marginal models showed BMI increasing, physical activity decreasing and smoking decreasing linearly over time at the population level. The transition models showed smoking status to be highly predictable for individuals whereas BMI was only moderately predictable and physical activity was virtually unpredictable. Most of the predictive power was obtained from participant status at the previous survey. Predicted probabilities from the models mostly agreed with observed probabilities indicating adequate goodness-of-fit. Conclusions: The proposed form of lasagne plot provides a simple visual aid to show transitions in categorical variables over time in longitudinal studies. The suggested models complement the plot and allow formal testing and estimation of marginal and transitional distributions. These simple tools can provide valuable insights into categorical data on individuals measured at regular intervals over time.

Ju H, Jones M & Mishra G. Premenstrual syndrome and dysmenorrhea: symptom trajectories over 13 years in young adults. Maturitas, 2014; 80(4), 299-305. Objectives: To ascertain the prevalence of premenstrual syndrome (PMS) and dysmenorrhea in Australian women and to examine whether there is population subgroups with distinct symptom trajectories. Study design: A prospective cohort study, including 9671 young women random sampled from national Medicare database and followed up for 13 years, examined the prevalence, the trend and the symptom trajectories of the conditions. Main outcome measures: Prevalence of PMS and dysmenorrhea over time, their symptom trajectories, and the probability of symptom reporting at follow-up. Results: The prevalence of PMS varied between 33 and 41% and that of dysmenorrhea between 21 and 26%. The probabilities of reporting PMS and dysmenorrhea were 0.75 (95% CI, 0.73, 0.76) and 0.70 (95% CI, 0.68, 0.72), respectively, among women who reported them in three previous consecutive surveys. Four unique trajectories were identified for both conditions. PMS was experienced by 80% of women sometime during the study period, with normative (22.1%), late onset (21.9%), reciprocal and long-course courses. Dysmenorrhea occurred in 60% of women with normative (38.3%), low (28.0%), recovering (17.2%) and chronic (16.5%) groups identified. Conclusions: PMS and dysmenorrhea are common among young women. Both have relatively stable prevalence over time, but exhibit considerable variation at the individual level. Four subgroups of women who followed similar symptom trajectories were identified. PMS was experienced by 80% of women during the study period and it tended to be a long-lasting problem in many. Although 60% of women experienced dysmenorrhea, only a small group continuously reported it. Smoking status to be highly predictable for individuals whereas BMI was only moderately predictable and physical activity was virtually unpredictable. Most of the predictive power was obtained from participant status at the previous survey. Predicted probabilities from the models mostly agreed with observed probabilities indicating adequate goodness-of-fit.

Ju H, Jones M & Mishra G. The prevalence and risk factors of dysmenorrhea. Epidemiologic Reviews, 2014; 36(1), 104-113. Dysmenorrhea is a common menstrual complaint with a major impact on women’s quality of life, work productivity, and healthcare utilization. A comprehensive review was performed on longitudinal or case-control cross-sectional studies with large community-based samples to accurately determine the prevalence and/or incidence and risk factors of dysmenorrhea. Fifteen primary studies, published between 2002 and 2011, met the inclusion criteria. The prevalence of dysmenorrhea varies between 16% and 91% in women of reproductive age, with severe pain in 2%-29% of the women studied. Women’s age, parity, and use of oral contraceptives were inversely associated with dysmenorrhea, and high stress and increased risk of dysmenorrhea. The effect sizes were generally modest to moderate, with odds ratios varying between 1 and 4. Family history of dysmenorrhea strongly increased its risk, with odds ratios between 3.8 and 20.7. Inconclusive evidence was found for modifiable factors such as cigarette smoking, oral obesity, depression, and abuse. Dysmenorrhea is a significant symptom for a large proportion of women of reproductive age however, severe pain limiting daily activities is less common. This review confirms that dysmenorrhea improves with increased age, parity, and use of oral contraceptives and is positively associated with stress and family history of dysmenorrhea.


Background: Back pain is an increasingly prevalent health concern amongst Australian women for which a wide range of treatment options are available, offered by recognised medical, allied, complementary and alternative medicine (CAM) providers. Although there is an emerging literature on patterns of provider utilisation, less is known about the reasons why women with back pain select their chosen practitioner. In this paper we explore the influences on back pain sufferers’ decision-making of treatment with practitioners for their most recent episode of back pain.

Methods: Drawing on 50 semi-structured interviews with women aged 60–65 years from the Australian Longitudinal Study on Women’s Health (ALSWH) who have chronic back pain, we focus on the factors which influence their choice of practitioner. Analysis followed a framework approach to qualitative content analysis, augmented by NVivo 9 qualitative data analysis software. Key themes were identified and tested for rigour through inter-rater reliability and constant comparison.

Results: The women identified four predominant influences on their choice of practitioner for back pain: familiarity with treatment or experiences with individual practitioners; recommendations from social networks; geographical proximity of practitioners; and, qualifications and credentials of practitioners. The therapeutic approach or evidence-base of the practices being utilised was not reported by the women as central to their back pain treatment decision-making.

Conclusions: Choice of practitioner appears to be unrelated to the therapeutic approaches, treatment practices or the scientific basis of therapeutic practices. Moreover, anecdotal lay reports of effectiveness and the treatment environment are more influential than formal qualifications in guiding women’s choice of practitioner for their back pain. Further work is needed on the interpersonal, collective and subjective underpinnings of practitioners choice, particularly over time, in order to better understand why women utilise certain practitioners for back pain.

Leung J, Pachana N & McLaughlin D. Social support and health-related quality of life in women with breast cancer: A longitudinal study. Psycho-Oncology, 2014; 23(9), 1014-1020. Objectives: A breast cancer diagnosis is a distressing event that impacts on physical and psychological functioning. This study examined the longitudinal relationships among a diagnosis of breast cancer, social support, and health-related quality of life (HRQOL).

Methods: Participants were 412 women from the 1946–1951 birth cohort of the Australian Longitudinal Study on Women’s Health (ALSWH) who self-reported a new diagnosis of breast cancer between 1998 and 2007. The three surveys of longitudinal data analyzed included data 3 years before diagnosis, at diagnosis (baseline), and 3 years after diagnosis (follow-up). Social support was measured using the 19-item Medical Outcomes Study Social Support Survey; HRQOL was measured using the Medical Outcomes Study 36-item Short-Form Health Survey.

Results: Compared with pre-diagnosis HRQOL, women newly diagnosed with breast cancer reported significantly poorer HRQOL in subscales related to pain, physical functioning, and psychological well-being. At 3-year follow-up, HRQOL had improved in most domains to levels consistent with pre-diagnosis. Levels of social support remained stable across time. The structural equation model showed that social support was positively predictive of better physical and mental HRQOL at 3-year follow-up.

Conclusions: Longitudinal analyses indicate that social support appears to be an important predictor of HRQOL in women diagnosed with breast cancer. In particular, positive emotional and informational support that may normally be provided by a partner is an important factor. Identification of those lacking social support, especially patients without partners, will enable them to be guided to appropriate support networks and programs.

Objectives: This paper examines factors associated with the uptake of i) long-acting reversible, ii) permanent and iii) traditional contraceptive methods among Australian women.

Methods: Participants in the Australian Longitudinal Study on Women’s Health born in 1973-78 reported on their contraceptive use at three surveys: 2003, 2006 and 2009. The participants were 5,849 women aged 25-30 in 2003 randomly sampled from Medicare. The main outcome measure was current contraceptive method. Women who did not report trauma exposure. The association between trauma and CHD was largely explained by psychological factors, suggesting a direct pathway between exposure to trauma and risk of CHD.


This paper examines how the relationships between the factors (predictive, enabling and illness) of the 1973 Andersen framework and service use are influenced by changes in the caring role in older women of the 1921–26 cohort of the Australian Longitudinal Study on Women’s Health. Outcome variables were the use of three formal community support services: (a) nursing or community health services, (b) home-making services and (c) home maintenance services. Predictor variables were survey wave and the following carer characteristics: level of education, country of birth, age, area of residence, ability to manage on income, need for care, sleep difficulty and changes in caring role. Carer changes were a significant predictor of formal service use. Their inclusion did not attenuate the relationship between the Andersen framework factors and service use, but instead provided a more complete representation of carers’ situations. Women were more likely to have used support services if they had changed into or out of co-resident caring or continued to provide co-resident care for a frail, ill or disabled person, needed care themselves, and reported sleep difficulties compared with women who did not provide care.

Conclusions: Location of residence is an important factor in women’s choices about long-acting and permanent contraceptive in addition to the number and age of their children.

Implications: Further research is needed to understand the role of geographical location in women’s access to contraceptive options in Australia.


The objective of the current study was to examine whether exposure to trauma in the form of a history of physical, mental, emotional or sexual abuse or violence predicted new onset of CHD (coronary heart disease) in women. In addition, this study aimed to examine the mediation effects of psychological, lifestyle and health related factors in the abuse-CHD relationship. Data from 6 surveys over 15 years, from the Australian Longitudinal Study on Women’s Health, a large prospective cohort study, were used. Participants from the 1946-1951 cohort who did not self-report heart disease at surveys 1 (1996) and 2 (1998) and who had provided information on other variables were included (n = 9,276). After adjusting for age, women who reported trauma exposure at baseline were 1.54 times more likely (95 % confidence interval 1.29-1.83) to report new onset of CHD than those who did not report trauma exposure. The association between trauma and CHD was largely explained by psychological factors, suggesting a direct pathway between exposure to trauma and risk of CHD.


Objective: To examine the prevalence and characteristics of women who self-prescribe complementary and alternative medicine (CAM) for back pain.

Methods: A cross-sectional survey of a nationally-representative sample of women aged 60-65 years from the Australian Longitudinal Study on Women’s Health (ALSWH).

Results: A significant number of women (75.2%, n = 985) self-prescribed one or more CAM for back pain in the previous twelve months. Use of self-prescribed CAM for back pain was not associated with socio-economic status. The most common self-prescribed CAM used by women was supplements (n = 776, 59.2%), vitamins/minerals (n = 592, 45.2%), yoga/meditation (n = 187, 14.3%), herbal medicines (n = 172, 13.1%) and aromatherapy oils (n = 112, 8.8%). Women who visited general practitioners (GPs) more than three times in the previous twelve months were 1.59 times (95% CI: 1.14, 2.22) more likely to self-prescribe CAM for back pain than those women who did not visit GPs. Women who visited a pharmacist three or more times in the previous twelve months were 2.90 times (95% CI: 1.65, 5.09) more likely to self-prescribe CAM for back pain than those women who did not visit a pharmacist.

Conclusion: This study identifies substantial usage of self-prescribed CAM by women for back pain regardless of their education, income or urban/rural residency. In order to ensure safe, effective practice it is important that all providing and managing health services for back pain sufferers remain mindful of patients’ possible use of self-prescribed CAM.


Objective: To identify the proportion of female carers who experience death thoughts and the factors associated with these thoughts, using data from the Australian Longitudinal Study on Women’s Health (ALSWH).

Methods: A cross-sectional analysis of the fifth ALSWH survey was conducted. 10,528 middle-aged women provided data on caring and death thoughts, 3077 were carers and 2005 of those were included in the multivariate analysis.

Results: 7.1% of female carers had felt life was not worth living in the previous week and were classified as having experienced death thoughts compared with 5.7% of non-carers (p < .01). Carers with death thoughts had poorer physical and mental health, higher levels of anxiety, lower levels of optimism, and reported less social support (p < .01). In a multivariate model social support, mental health, carer satisfaction, and depressive symptoms significantly predicted death thoughts. Carers with clinically significant depressive symptoms were four times more likely to experience death thoughts than those without. Carers who were satisfied with their role were 50% less likely to have experienced death thoughts than those who were dissatisfied.

Conclusions: A small but significant proportion of female carers experience death thoughts and may be at risk for suicide. These findings add to the growing body of evidence on suicide-related thoughts and behaviours in carers and have implications for health professionals and service providers.


Background: Physical inactivity and prolonged sitting are associated with negative health outcomes.

Purpose: To examine the health-related costs of prolonged sitting and inactivity in middle-aged women.
Methods: Australian Longitudinal Study on Women's Health participants (born 1946–1951) answered questions about time spent sitting, walking, and in moderate and vigorous leisure activities in 2001 (n=6108), 2004 (n=5902), 2007 (n=5754) and 2010 (n=5535) surveys. Sitting time was categorized as low (0–4), moderate (5–7), and high (8 hours/day).

Methods: Administrative claims data were used to describe AOM dispensing in 4649 participants born in 1921-1926 and still alive in 2011 for confounders. No statistically significant associations were found between sitting time and costs. When comparisons were made with a HC group, there is considerable room for improvement in the diet quality of Australian BCS. Given research suggesting higher risk of chronic conditions such as obesity amongst BCS, and the recognition of optimising diet quality as a key factor in health promotion for all population groups, data from the present study suggest the need for research targeting the feasibility and impact of improving diet quality of Australian BCS.

Differences between categories in median costs were estimated using quintile regression over four surveys with bootstrapped 95% CIs. Analyses were performed in 2013.

Results: In 2010, annual median costs were AU$689 (interquartile range [IQR]=274, 1541) in highly active participants, AU$709 (IQR=283–1575) in participants with low sitting time, and AU$709 (IQR=283–1575) in participants with high sitting time. The difference in median costs for inactive and highly active participants was AU$94 (CI=57, 131) after adjustment for confounders. No statistically significant associations were found between sitting time and costs. When sitting and physical activity were combined, high sitting time did not add to the inactivity-associated increased costs. Associations were consistent across normal weight, overweight, and obese subgroups.

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Conclusions: No statistically significant associations were found between sitting time and costs. When comparisons were made with a HC group, there is considerable room for improvement in the diet quality of Australian BCS. Given research suggesting higher risk of chronic conditions such as obesity amongst BCS, and the recognition of optimising diet quality as a key factor in health promotion for all population groups, data from the present study suggest the need for research targeting the feasibility and impact of improving diet quality of Australian BCS.

Methods: This cross-sectional study included 281 BCS and 4609 HC from the Australian Longitudinal Study on Women's Health mid-aged cohort completing Survey 3 in 2001. Data from the Dietary Questionnaire for Epidemiological Studies food frequency questionnaire were used to calculate the Australian Recommended Food Score (ARFS), a validated summary estimate of diet quality based on adherence to the Australian dietary guidelines.

Results: The mean (SD) ARFS of the BCS group was 33.2 (9.4) out of a maximum of 74. Mean (SD) total ARFS and component scores of BCS did not differ from the HC group [32.9 (8.7)] and no differences were found in ARFS between urban and rural BCS.

Conclusions: This is the first study dedicated exclusively to describing the diet quality of Australian BCS. Although no difference was found when comparisons were made with a HC group, there is considerable room for improvement in the diet quality of Australian BCS. Given research suggesting higher risk of chronic conditions such as obesity amongst BCS, and the recognition of optimising diet quality as a key factor in health promotion for all population groups, data from the present study suggest the need for research targeting the feasibility and impact of improving diet quality of Australian BCS.

Methods: Analyses were undertaken on the 2001 and 2004 surveys of mid-aged women in the Australian Longitudinal Study on Women's Health. Dependent variables were self-reported use in past 4 weeks of medications recommended or prescribed by a doctor for depression, anxiety, stress, and sleep problems; and modelled baseline factors that predicted use over 3 years for each condition.

Results: Prevalence of prescribed medication use (2001, 2004) for each condition was depression (7.2, 8.9 %), anxiety (7.4, 9.0 %), stress (4.8, 5.7 %), and sleep problems (8.7, 9.5 %). Multivariable analyses revealed that odds of medication use across 3 years in all four conditions were higher for women with poorer mental and physical health, using hormone replacement therapy (HRT), or having seen a counsellor; and increased over time for depression, anxiety, and stress models. Medication use for depression was also higher for overweight/obese women, ex-smokers, and unmarried. Medication use for anxiety was higher for unmarried and non-working/low occupational women. Medication use for stress was higher for non-working women. Additional predictors of medication use were surgical menopause, area of residence.

Conclusions: Self-reported use of prescribed medication for four mental health conditions is increased over time after controlling for mental and physical health and other variables. Research needs to explore decision-making processes influencing differential rates of psychoactive medication use and their relationship with health outcomes.


Background: Age at natural menopause (ANM) is considered a marker of biological ageing and is increasingly recognized as a sentinel for chronic disease risk in later life. Socioeconomic position (SEP) and lifestyle factors are thought to be associated with ANM.

Methods: We performed a systematic review and meta-analyses to determine the overall mean ANM, and the effect of SEP and lifestyle factors on ANM by calculating the weighted mean difference (WMD) and pooling adjusted hazard ratios. We explored heterogeneity using meta-regression and also included unpublished findings from the Australian Longitudinal Study on Women's Health.

Results: We identified 46 studies across 24 countries. Median age at menopause (time variable) was 48.8 years (95% CI=48.3, 49.2), with between-study heterogeneity partly explained by geographical region. ANM was lowest among African, Latin American, Asian and Middle Eastern countries and highest in Europe and Australia, followed by the USA. Education was associated with later ANM (WMD middle vs low education 0.30, 95% CI: 0.10, 0.51; high vs low education 0.64, 95% CI 0.26, 1.02). A similar dose-response relationship was also observed for occupation. Smoking was associated with a 1-year reduction of ANM (WMD: -0.91, 95% CI: -1.34, -0.48). Being overweight and moderate/high physical activity were modestly associated with later ANM, but findings were less conclusive.

Conclusions: ANM varies across populations, partly due to differences across geographical regions. SEP and some lifestyle factors are associated with ANM, but further research is needed to examine the impact of the associations between risk factors and ANM on future health outcomes.


Objective: The study examined prevalence of self-reported use of medication recommended or prescribed by a doctor for depression, anxiety, stress, and sleep problems; and modelled baseline factors that predicted use over 3 years for each condition.

Methods: Analyses were undertaken on the 2001 and 2004 surveys of mid-aged women in the Australian Longitudinal Study on Women's Health. Dependent variables were self-reported use in past 4 weeks of medications recommended or prescribed by a doctor for depression, anxiety, stress, and sleep problems; and modelled baseline factors that predicted use over 3 years for each condition.

Results: Prevalence of prescribed medication use (2001, 2004) for each condition was depression (7.2, 8.9 %), anxiety (7.4, 9.0 %), stress (4.8, 5.7 %), and sleep problems (8.7, 9.5 %). Multivariable analyses revealed that odds of medication use across 3 years in all four conditions were higher for women with poorer mental and physical health, using hormone replacement therapy (HRT), or having seen a counsellor; and increased over time for depression, anxiety, and stress models. Medication use for depression was also higher for overweight/obese women, ex-smokers, and unmarried. Medication use for anxiety was higher for unmarried and non-working/low occupational women. Medication use for stress was higher for non-working women. Additional predictors of medication use were surgical menopause, area of residence.

Conclusions: Self-reported use of prescribed medication for four mental health conditions is increased over time after controlling for mental and physical health and other variables. Research needs to explore decision-making processes influencing differential rates of psychoactive medication use and their relationship with health outcomes.

Background: While some studies have reported effectiveness of aromatherapy oils use during labour there is no reported evidence of efficacy or risks of aromatherapy oils use for pregnancy-related symptoms or conditions. A number of aromatherapy oils are unsafe for use by pregnant women yet there is currently no research examining the prevalence and characteristics of women who use aromatherapy oils during pregnancy.

Aim: To conduct an empirical study of the prevalence and characteristics of women who use aromatherapy oils during pregnancy.

Methods: The research was conducted as part of the Australian Longitudinal Study on Women's Health (ALSWH), focusing on the nationally representative sample of Australian women aged 31–36 years. Data were collected via a cross-sectional questionnaire (n = 8200) conducted in 2009.

Results: Self-prescribed aromatherapy oils were used by 15.2% of pregnant women. Pregnant women were 1.57 (95% CI: 1.01, 2.43) times more likely to self-prescribe use of aromatherapy oils if they have allergies or hayfever, and 2.26 (95% CI: 1.34, 3.79) times more likely to self-prescribe use of aromatherapy oils if they have a urinary tract infection (UTI).

Conclusion: Our study highlights a considerable use of aromatherapy oils by pregnant women. There is a clear need for greater communication between practitioners and patients regarding the use of aromatherapy oils during pregnancy, as well as for health care practitioners to be mindful that pregnant women in their care may be using aromatherapy oils, some of which may be unsafe.

Sibbritt D; Catling C, Adams J, Shaw A & Homer C

Sibbritt D. The decline of herbal medicine/naturopathy consultations: How research can help further the profession. Australian Journal of Herbal Medicine, 2014; 26(1), 8-9.

At present there is much debate within the herbal medicine/naturopathy professions as to the merits of registration. Further, there is a history of division within the professions of herbal medicine and naturopathy in relation to different models of regulation. So, with the decline of herbal/naturopathy consultations with a CAM practitioner, various demographic and employer status factors were related, including employment status, financial status and level of education. Women’s health insurance coverage, health status, and perceptions toward both conventional maternity care and CAM were also associated with their likelihood of consultations with all practitioner groups in diverse ways.

Conclusions: The determinants for women’s consultations with a CAM practitioner varied across practitioner groups. Stakeholders and researchers would benefit from giving attention to specific individual modalities when considering CAM use in maternity care.

Steel A, Adams J, Sibbritt D, Broom A & Gallois C

Determinants of women consulting with a complementary and alternative medicine practitioner for pregnancy-related health conditions. Women and Health, 2014; 54(2), 127-144.

Abstract Objective: To explore the determinants that are related to women’s likelihood to consult with a complementary and alternative medicine (CAM) practitioner during pregnancy. Study setting: Primary data collected as a sub-study of the Australian Longitudinal Study on Women’s Health (ALSWH) in 2010. Study design: A cross-sectional survey of 2445 women from the ALSWH ‘younger’ cohort (n=8012) who had identified as being pregnant or had recently given birth in 2009.

Data collection/extraction: Independent Poisson backwards stepwise regression models were applied to four CAM practitioner outcome categories: acupuncturist, chiropractor, massage therapist and naturopath.

Principal findings: The survey was completed by 1835 women (79.2%). The factors associated with women’s consultation with a CAM practitioner differed by practitioner group. A range of demographic factors were related, including employment status, financial status and level of education. Women’s health insurance coverage, health status, and perceptions toward both conventional maternity care and CAM were also associated with their likelihood of consultations with all practitioner groups in diverse ways.

Conclusions: Women in the 1973–78 cohort showed more varying and transitional caring trajectories compared to those in the 1946–51 cohort. followers of a socio-economic status were associated with trajectories representing ‘ongoing’ and ‘starting’ caring, they were not associated with ‘transitional’ caring trajectories. Three distinct trajectories of caring were identified for the mid-age women: these represented ongoing, ‘starting’ and never caring. The mid-age women, poorer socio-economic status indicators were associated with the ‘ongoing’ caring, but not ‘starting’ caring.

Tu F, Hongyan Du, Goldstein G, Beaumont J, Zhao Y & Brown W

The influence of prior oral contraceptive use on risk of endometriosis is conditional on parity. Fertility and Sterility, 2014; 101(6), 1697-1704.

Objective: To estimate the influence of prior oral contraceptive pill (OCP) use on future diagnosis of endometriosis, adjusting for parity.

Design: Prospective cohort study, the Australian Longitudinal Study on Women’s Health.

Patient(s): 9,585 women age 18-23 at study onset. Intervention(s): None.

Main outcome measure(s): Risk of self-reported endometriosis estimated with Cox proportional-hazards regression with time-dependent covariates.

Result(s): Compared with never users, endometriosis hazard ratios in nulliparous women with ≤3 years
and ≥ 5 years of OCP use (preceding diagnosis) were 1.8 (95% CI, 1.30-2.53) and 2.3 (95% CI, 1.59-3.40), respectively. Similar risk was seen in both women reporting infertility at age 30 years or older. In parous women with < 5 years of use, the hazard ratio for endometriosis was 0.41 (95% CI, 0.15-1.06) and for ≥ 5 years of use was 0.45 (95% CI, 0.16-1.23). Women reporting early noncontraceptive OCP use had a twofold higher risk (odds ratio 2.07; 95% CI, 1.72-2.51).

Conclusion(s): Prior OCP exposure reduces the risk of diagnosis of endometriosis in parous women but increases it among nulliparous women; these associations appear unaffected by fertility status. An increased risk of endometriosis diagnosis seen in women reporting early noncontraceptive OCP use may explain some of the positive OCP risk seen in nulliparous women.


Objectives: To identify the biological, socio-demographic, work-related and lifestyle determinants of physical activity (PA) in young adult Australian women. Design: Prospective cohort study. Methods: Self-reported data from 11,676 participants (aged 22-27 years in 2000) in the Australian Longitudinal Study on Women's Health were collected over 9 years in 2000, 2003, 2006 and 2009. Generalised Estimating Equations were used to examine univariable and multivariable associations of body mass index (BMI), country of birth, area of residence, education, marital status, number of children, occupational status, working hours, physical activity, smoking, alcohol intake and stress with week- and weekend-day sitting time. Results: Compared with women in the respective referent categories, (1) women with higher BMI, those born in Asia, those with less than 12 years of education, doing white collar work, working 41-48 hours a week, current smokers, non, rare or risky/high risk drinkers and those being somewhat stressed had significantly higher sitting time; and (2) women living in rural and remote areas, those partnered women, those with children, those without a paid job and blue collar workers, those working less than 34 hours a week, and active women had significantly lower sitting time. Conclusions: Among young adult Australian women, those with higher BMI, those born in Asia, those with less than 12 years of education, doing white collar work, working over 40 hours a week, current smokers, non, rare or risky/high risk drinkers and those being somewhat stressed had significantly higher sitting time; and (2) women living in rural and remote areas, those partnered women, those with children, those without a paid job and blue collar workers, those working less than 34 hours a week, and active women had significantly lower sitting time. Study limitations: Dietary assessment was carried out only at baseline and although adjustments were made for all known potential confounders, residual confounding cannot be entirely excluded.

Conclusions: Low dietary zinc intake is associated with a greater incidence of depression in both men and women, as shown in two prospective cohorts. Further studies into the precise role of zinc compared to other important nutrients from the diet are needed.
Women’s Health (ALS WH). Design: Cross-sectional analysis of a longitudinal women not reporting PCOS in a community-based infertility, fertility treatment use and relationship to treatments published to date. We aim to compare natural history studies on fertility and fertility anovulatory infertility, with major health and economic burden. 6-21% of women. PCOS is the primary cause of infertility. We note increased prevalence of hypertension and treatment was significantly higher in women reporting PCOS, compared to 16 of 4547 women not reporting PCOS (p<0.001). Hypertension was associated with BMI (OR 1.07, 95% CI 1.05-1.10, p<0.001) with a trend towards an association with infertility and use of fertility treatment. Results: Self-reported PCOS prevalence was 5.8% (95% CI: 5.3-6.4%). Infertility was noted by 72% of 309 women reporting PCOS, compared to 16% of 4547 women not reporting PCOS (p<0.001). Infertility was 15 fold higher in women reporting PCOS (adjusted OR 14.9, 95% CI 10.9-20.3), independent of BMI. Of women reporting infertility, there was greater use of fertility hormone treatment, (62%, n=116 vs 33%, n=162, p<0.001) in women reporting PCOS; however IVF use was similar. Conclusions: In this community-based cohort of women, infertility and use of fertility hormone treatment was significantly higher in women reporting PCOS. Considering the prevalence of PCOS and the health and economic burden of infertility, strategies to optimise fertility are important.

Navin TJ, Stewart-Williams J, Parkinson L, Sibbritt D & Byles JE. Identification of diabetes, heart disease, hypertension and stroke in mid- and older-aged women: comparing self-report and administrative hospital data records. Geriatrics & Gerontology International, 2014. Aim: To estimate the prevalence of diabetes, heart disease, hypertension and stroke in self-report and hospital data in two cohorts of women; measure sensitivity and agreement between data sources; and compare between cohorts. Methods: Women born between 1946-1951 and 1921-1926 were included in the present study. The prevalence of diabetes, heart disease, hypertension and stroke was estimated using self-report (case 1 at latest survey, case 2 women multiple surveys) and hospital records. Agreement (kappa) and sensitivity (%) were calculated. Logistic regression measured the association between patient characteristics and agreement. Results: Hypertension had the highest prevalence and estimates were higher for older women: 32.5% case 1, 4.5% case 2, 12.8% in hospital data (1946-1951 cohort); 57.8% case 1, 73.2% case 2, 38.2% in hospital data (1921-1926 cohort). Agreement was substantial for diabetes: k=0.75 case 1, k=0.70 case 2 (1946-1951 cohort); k=0.77 case 1, k=0.80 case 2 (1921-1926 cohort), and lower for other conditions. The 1946-1951 cohort had 2.08 times the odds of agreement for hypertension (95% CI 1.56 to 2.78; P<0.0001), and 6.25 times the odds of agreement for heart disease (95% CI 4.74 to 10.0; P<0.0001), compared with the 1921-1926 cohort.

Conclusion: Substantial agreement was found for diabetes, indicating accuracy of ascertainment using self-report or hospital data. Self-report data appears to be less accurate for heart disease and stroke. Hypertension was underestimated in hospital data. These findings have implications for epidemiological studies relying on self-report or administrative data.


Main outcome measures: Anticholinergic burden calculated from Anticholinergic Drug Scale (ADS) scores derived from ADS levels (0 to 3) for all medicines used by each woman, summed over each 6-month period (semester), medicines commonly used by women with high semester ADS scores (defined as 75th percentile of scores). Results: 1126 women (59.9%) used at least one medicine with anticholinergic properties. The median ADS score was 4 or 5 across all semesters. Most anticholinergic medicines used by women who had a high anticholinergic burden (ADS score ≥ 9) had a low anticholinergic potency (ADS level 1). Increasing age, cardiovascular disease, and number of other medicines used were predictive of a higher anticholinergic burden.

Conclusions: A high anticholinergic medicines burden in this group was driven by the use of multiple medicines with low anticholinergic potency rather than the use of medicines with higher potency. This is a novel and important finding for clinical practice as doctors would readily identify the risk of a high anticholinergic burden for patients using high potency medicines, but may be less likely to identify this risk for users of multiple medicines with low anticholinergic potency.

Pavey T, Burton N & Brown W. Prospective relationships between physical activity and optimism in young and mid-aged women. Journal of Physical Activity and Health, 2014; doi:10.1123/jpah.2014-0070. Background: There is growing evidence that physical activity (PA) reduces the risk of poor mental health. Less research has focused on the relationship between PA and optimism, including in young and mid-aged women. Methods: 9688 young women (born 1973-78) completed self-report surveys in 2000 (age 22-27), 2003, 2006, and 2009; and 11,226 mid-aged women (born 1946-51) completed surveys in 2001 (age 50 to 55); 2004, 2007 and 2010, as part of the Australian Longitudinal Study on Women’s Health. Generalised estimating equation models (with 3-year time lag) were used to examine the relationship between PA and optimism in both cohorts. Results: In both cohorts, women reporting higher levels of PA had greater odds of reporting higher optimism over the 9-year period, (young, OR=3.04, 95%CI: 3.85-5.69; mid-age, OR=3.77, 95%CI: 4.76-7.00) than women who reported no PA. Odds were attenuated in adjusted models, with depression accounting for a large amount of this attenuation (young, OR=2.00, 95%CI: 1.57-2.55; mid-age, OR=1.64 95%CI: 1.38-1.94). Conclusions: Physical activity can promote optimism in young and mid-aged women over time, even after accounting for the negative effects of other psychosocial indicators such as depression.
CONFERENCE PRESENTATIONS

In 2014, ALSWH data was presented at over 30 conferences

Byles J & Chojenta C.

Byles J, Francis L, Hubbard I, Tavener M & Chojenta C.
Long-term survival of older Australian women with a history of stroke.
Smart Strokes 2014 Conference, Sydney, NSW, 28-29 August 2014.

Byles J.
Late life changes in physical and mental health: a study of 12433 women over 17 years.
British Society of Gerontology Annual Conference, Southampton, United Kingdom, 1-3 September, 2014.

Byles J, Francis L, Hubbard I, Tavener M & Chojenta C.
Long-term outcomes for older Australian women with a history of stroke.
43rd Annual Conference of the British Society of Gerontology, Southampton, United Kingdom, 1-3 September, 2014.

Byles J, Leigh L, Chojenta C & Pachana N.
Late life changes in mental health: A longitudinal study of 9973 women.
Society for Longitudinal and Life Course Studies, Annual Conference, Lausanne, Switzerland, 9-11 October 2014.

Byles J.
Mental Health Across the Life Course.

Byles J.
From Go to WHOA! Generations and Change in ALSWH

Chan L, Mishra G, Thompson C, Miller M & Cobiac L.
Fish consumption in young Australian women – results from the Australian Longitudinal Study on Women’s Health.
Dietitians Association of Australia 31st National Conference, Brisbane, QLD, 15-17 May 2014.

Clark BK, Peeters GMEE, Gomersall SR, Pavey TG & Brown WJ.
Nine year changes in sitting time in young and mid-aged Australian women: Australian Longitudinal Study for Women’s Health.

de Luca K, Parkinson L, Byles J, Bluth F & Pollard H.
How does neuropathic pain affect quality of life in women with arthritis.
CAYAWNS Inaugural Research Symposium. Sydney, NSW, 13-14 September 2014.

Dillon G.
A profile of intimate partner violence in the young cohort of the Australian Longitudinal Study on Women’s Health: Demographic associations across 16 years.

Dolja-Gore X.
Treatment effects on mental health outcomes for Australian women uptakeing the Better Access Scheme mental health counselling services: A data linkage study.
International Data Linkage Conference, Vancouver, Canada, 28-30 April 2014.

Dolja-Gore X.
How effective are Australian mental health counselling services for women with poor mental health?
International Society of Pharmacoeconomics and Outcomes Research, Montreal, Canada, 31 May - 4 June 2014.

Eftekhari P.
Impact of asthma on mortality in older women: an Australian cohort study of 10413 women.

de Luca K, Parkinson L, Byles J, Bluth F & Pollard H.
How does neuropathic pain affect quality of life in women with arthritis.
142nd APHA Annual Meeting and Exposition, New Orleans, USA, 15-19 November 2014.

Relationships between physical activity, walking and health-related quality of life in women with depressive symptoms.
Be Active 2014, Canberra, ACT, 15-18 October 2014.

Jackson M.
The bidirectional association between sleep and mental health.
Australasian Sleep Association Victoria Branch Meeting, Melbourne, Vic, May 2014.

Ju H.
PMS & dysmenorrhea: Symptom trajectories over 13 years.

Ju H.
Prevalence and risk factors of dysmenorrhea: Concurrency of results from a comprehensive review and longitudinal data.

Kennagh R.
As time goes by: A longitudinal thematic analysis of the evolution of widowed women’s life experiences.

Laaksonen M.
Population-level relevance of risk factors for cancer in the presence of competing risk of death.
World Cancer Congress, Melbourne, Vic, 7-10 July 2014.

Laaksonen M.
Population-level relevance of risk factors for cancer in the presence of competing risk of death.

Lai J.
Diet quality and depressive symptoms in mid-age Australian women.
7th Biennial Congress of The International Society of Affective Disorders, Berlin, Germany, 28–30 April, 2014.

Leung J, Martin J, Dobson A, McKenzie S & McLaughlin D.
Obesity and advanced breast cancer in rural and urban Australia - a data linkage study.
Australasian Epidemiological Association Annual Scientific Meeting, Auckland, New Zealand, 8–10 October 2014.

Joham A, Ranasingha S, Zoungas S & Teede H.
Longitudinal risk of type 2 diabetes in reproductive-aged women with Polycystic Ovary Syndrome.
Leung J, Martin J, McKenzie S & McLaughlin D. Obesity and advanced breast cancer in rural and urban Australia - a data linkage study. The University of Queensland, School of Population Health 2014 Research Higher Degree Conference, Brisbane, Qld, 5 November 2014.


McLaughlin, D. Hockey R & Byles J. Mental health in older women before, during and after bereavement. Gerontological Society of America Annual Scientific Meeting, Washington DC, USA, 5-9 November 2014.


Sibbritt D. Women who consult with naturopaths are optimists! The 2nd International Congress on Naturopathic Medicine, Paris, France, 4-6 July 2014.


ENQUIRIES

University of Newcastle
A/Professor Deborah Loxton
Deputy Director
Australian Longitudinal Study on Women's Health
Priority Research Centre for Gender, Health & Ageing
University of Newcastle
Callaghan NSW 2308
AUSTRALIA
T +61-2-4042 0690
F +61-2-4042 0044
E info@alswh.org.au

University of Queensland
A/Professor Leigh Tooth
Deputy Director
Australian Longitudinal Study on Women's Health
School of Public Health
University of Queensland
Herston QLD 4006
AUSTRALIA
T +61-7-3346 4691
F +61-7 3365 5540
E sph-wha@sph.uq.edu.au

Data Archiving
The Australian Longitudinal Study on Women's Health has a policy to archive the ALSWH data with the Australian Social Sciences Data Archive (ASSDA) at the Australian National University on an annual basis. To date, data have been archived for Surveys 1, 2, 3, 4, 5 and 6 of the 1973-78, 1984-51 and 1921-26 cohorts. Data from the 6MF has also been archived for the 1921-26 cohort.

www.alswh.org.au
A detailed description of the background, aims, themes, methods, representativeness of the sample and progress of the study is given on the project web page. Copies of surveys are also available on the website, along with contact details for the research team, abstracts of all papers published, papers accepted for publication, and conference presentations.