The Australian Longitudinal Study on Women's Health

Healthy Activity, Healthy Weight, Healthy Women

1 INTRODUCTION

" My main aim as far as my health is concerned at present is to increase my declining fitness levels and tone up my body. I am conscious of family tendency to heart disease, stroke and high cholesterol levels so am also concentrating on my diet (low fat high fibre) ... I am attempting to walk several times a week. I am also passionate about gardening so I do get some exercise there and I'm sure it helps my flexibility. "

Physical activity and the maintenance of healthy body weight have significant effects on the prevention and management of chronic disease. A recently published joint WHO/FAO report found that there is convincing evidence relating:

(1) regular physical activity to the prevention of obesity, type 2 diabetes, cardiovascular disease, some cancers and osteoporosis;

(2) overweight and obesity to the development of type 2 diabetes and some cancers; and

(3) low body weight to the development of osteoporosis.

Physical activity and healthy weight are also implicated in the prevention of some cancers and in the management of many of these chronic diseases.

The Australian Longitudinal Study on Women's Health (ALSWH) offers the first opportunity in Australia to explore the relationships between physical activity and weight and the development and progression of chronic disease in three cohorts of Australian women. The study also provides the opportunity to track changes in physical activity and weight through natural life-stages, and to document the individual and social factors which are associated with changes in these variables across the adult life-span.

Further information is available in the technical report *Physical Activity, Body Mass Index and Health in Australian Women.*

women's health australia

www.newcastle.edu.au/centre/wha

2 PHYSICAL ACTIVITY AND BODY WEIGHT

At Survey 2, around half the ALSWH women (55% of the Younger cohort, 51% of the Mid-age cohort and 38% of the Older cohort) were categorised as "sufficiently active for health benefit" (reporting more than 150 minutes of at least moderate intensity activity per week). In general, those less likely to be categorised as "active" were:

- Women who were married or in de facto relationships
- Women who were born in Europe, Asia or other non-English speaking countries
- Women from more disadvantaged backgrounds

The proportions of women in each BMI category at Survey 1 and Survey 2 are shown for each age group in Figure 1. The Younger women were most likely to be underweight or in the healthy weight range, while overweight and obesity were much more common in the Mid-age and Older groups.

"I was all ready to be a middle-aged frump … 18 months ago I found a weight loss programme … I lost approx 12 kilos through proper eating and exercise. It taught me a lot about nutrition – something the whole family now benefits from and I embarked on a regular exercise program (4 km walking per day) … I feel really well; healthy when I'm exercising and eating properly."

In this study 'healthy weight' is assessed using Body Mass Index (BMI).

$$BMI = \text{weight (kg)} / \text{height}^2 (m^2)$$

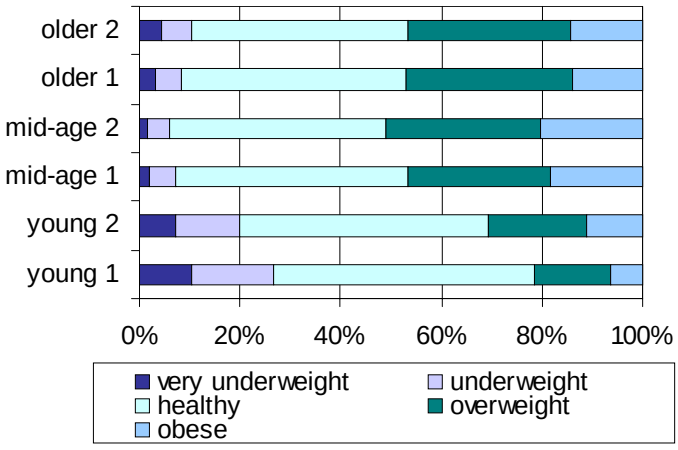
The following cut-offs are used to categorise BMI:

Very underweight	BMI	<18.5
Underweight	BMI	18.5 - <20
Healthy	BMI	20 - <25
Overweight	BMI	25 - <30
Obese	BMI	≥30

Women from rural and remote areas, those with lower levels of education and occupation, those with children, and Mid-age women who had had a hysterectomy were most likely to be obese.

Comparison of data from Survey 1 and Survey 2 of the Younger women shows that the proportion of Younger women who were overweight or obese increased from 22% to 33% in the four year period from age 18-23 to 22-27. An increase of this magnitude, in such a short time, has worrying implications for the future of health of young Australian women

Figure 1. Percentage of women in each BMI category at Survey 1 and Survey 2.



3 ACTIVITY, WEIGHT AND PHYSICAL HEALTH

The ALSWH analyses show that 'inactive' women (those doing less than 150 minutes of activity each week) were much more likely to report a wide range of symptoms, including:

- Tiredness
- Constipation
- Back pain
- Sleeping difficulties
- Menstrual symptoms
- Stiff or painful joints

Lack of physical activity was also associated with hypertension and osteoporosis.

Similarly, being overweight or obese was associated with the following:

Symptoms:
- Headache
- Back pain
- Tiredness

Diagnosed disease:
- Diabetes
- Asthma
- Hypertension

Surgical Procedures:
- Cholecystectomy (removal of the gallbladder)
- Hysterectomy

Compared with women who reported doing none, or only low levels of activity, women who reported between 150 and 300 minutes (moderate) or more than 300 minutes (high) of activity each week were much less likely to be 'high users' of GP services (see Figure 2).

"I have had lower back pain for years. It is worse when I am overweight. To correct the problem I am walking 2 kms 5 days a week and I am doing back and stomach muscle exercises to strengthen my back."

Women with Body Mass Index (BMI) outside the healthy weight range (BMI 20 - <25) were also more likely to report high use of GP services. Data for the Mid-age cohort are shown in Figure 3.

Figure 2. Percentage of Older women in each physical activity category reporting 'high' use of GPs.

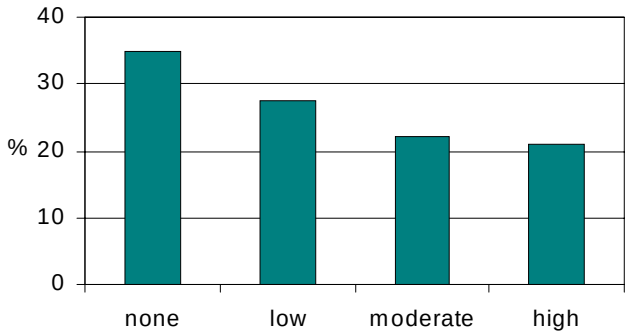


Figure 3. Percentage of Mid-age women in each BMI category reporting 'high' use of GPs.

4 HOW MUCH ACTIVITY FOR HEALTH BENEFIT?

A recent US Institute of Medicine report has suggested that the current guidelines for 'sufficient activity for health benefit' (30 minutes of moderate activity on most days, taken in Australia to equate with 150 minutes of activity per week) set the 'benefit' threshold too low (Food and Nutrition Board, Institute of Medicine, 2002). The report recommends that, in order to prevent most chronic health problems, the threshold should be raised to 60 minutes per day, or 420 minutes per week of activity. Data from the ALSWH can be used to inform this debate.

Figure 4 illustrates the relationship between physical activity (PA) and health-related quality of life [as indicated by the physical (PCS) and mental (MCS) components summary scores on the SF36]. In this figure, there are ten PA categories, with the purple dashed line showing the amount of activity which meets the current guideline of 150 minutes/week, and the green dashed line showing the proposed 'new' threshold of 420 minutes per week.

PCS scores increase with increasing activity. However, there is little increase in PCS scores above the current recommended levels of physical activity (purple dashed line). For mental health, the relationship with physical activity is less marked. Optimal MCS scores are associated with PA around one hour per day (green dashed line).

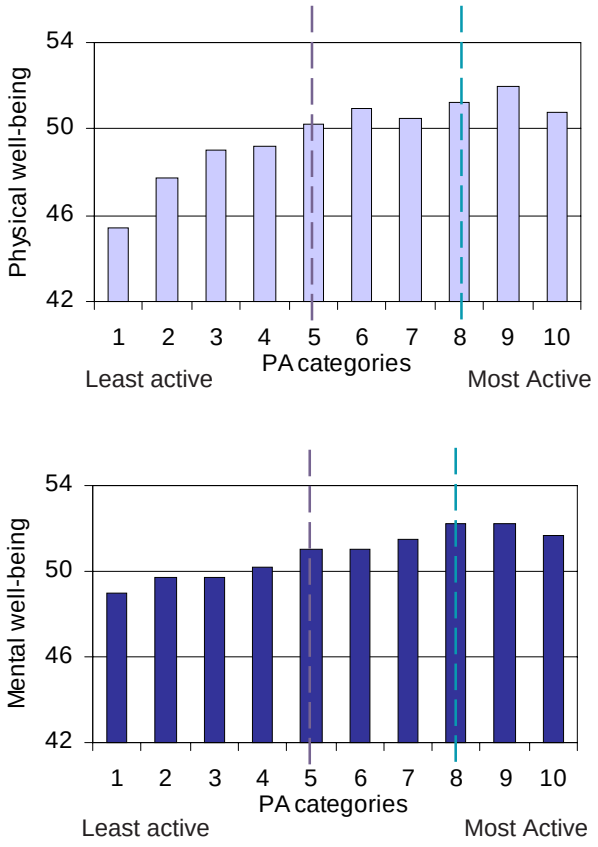
Although these are cross-sectional data, they suggest that low-moderate levels of PA are associated with improved physical well-being, and that higher levels of PA are associated with improved mental well-being

In relation to the debate about recommendations for PA levels, it is noteworthy that about 50% of the ALSWH women are currently classified as 'inactive' (doing less than 150 minutes of activity each week). If the 'threshold' for health benefit was moved to one hour a day (420 minutes a week), mid-age women who are currently in the lowest one third of the sample for PA would have to increase their activity time by almost 400 minutes per week (from an average of 22.5 minutes) to achieve this target. As our data show, many women have difficulty achieving current guidelines of 150 minutes of activity per week, so it is likely that most women would see this higher target as quite unrealistic.

NATIONAL PHYSICAL ACTIVITY GUIDELINES FOR AUSTRALIANS

1. think of movement as an opportunity not an inconvenience
2. be active every day in as many ways as you can
3. put together at least 30 minutes of moderate-intensity physical activity on most, preferably all, days
4. if you can, also enjoy some regular, vigorous exercise for extra health and fitness

Figure 4. Mean physical (PCS) and mental (MCS) well-being scores for Mid-age women, according to physical activity.



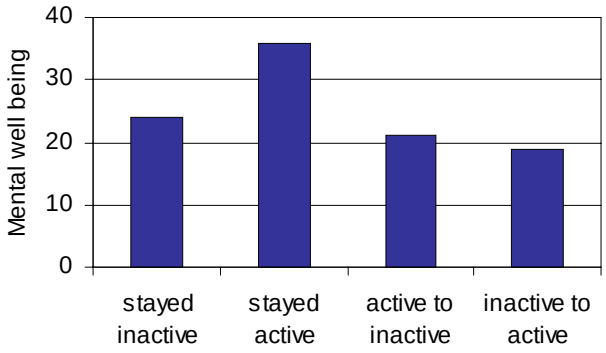
Purple dashed lines indicate the current 'threshold' (150 minutes/week) for 'sufficient PA for health benefit'; Green dashed lines indicate the proposed new threshold of one hour per day (420 minutes/week).

5 CHANGES IN PHYSICAL ACTIVITY OVER TIME AND THE SOCIAL CONTEXT OF THESE CHANGES

YOUNG WOMEN

Repeated cross-sectional data from the Young cohort suggest no change in the distribution of PA categories between Survey 1 (56% 'active') and Survey 2 (55% 'active'). However, longitudinal analysis showed that just over one third remained 'active' while about one quarter remained 'inactive' between 1996 and 2000. For almost 40% of the sample, physical activity category changed between Survey 1 and Survey 2, with approximately 20% of the women changing from being 'active' to 'inactive' and another 20% changing from being 'inactive' to 'active'. (See Figure 5).

Figure 5. Physical Activity Transitions between Survey 1 and Survey 2: Younger Women



Young women most likely to change from being 'active' at Survey 1 (age 18-23) to 'inactive' at Survey 2 (age 22-27) were:

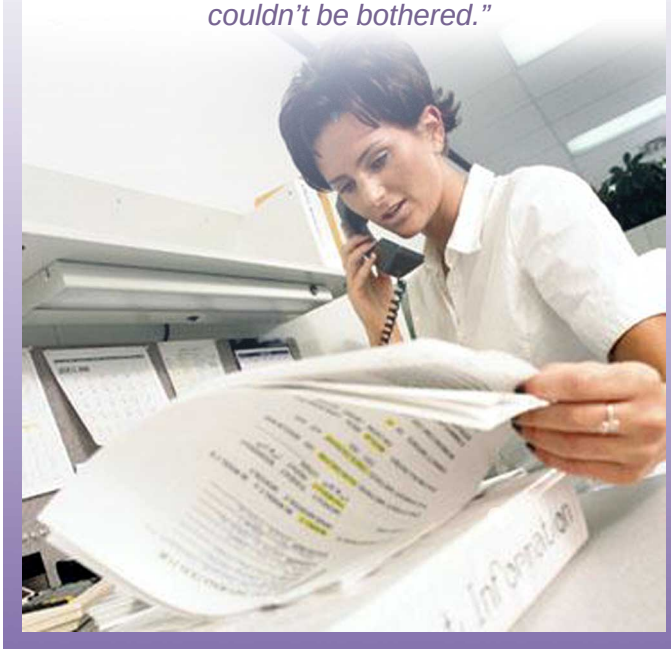
- those who married
- those who had their first baby
- those who had a subsequent baby
- those who began paid work

MID-AGE WOMEN

In the Mid-age cohort, the proportion of women meeting the PA guidelines (ie those doing at least 150 minutes each week) declined between Survey 2 and Survey 3 from 53% to 47%. Approximately 21% of the Mid-age women changed from being 'active' to 'inactive' and 15% changed from being 'inactive' to 'active.'

- Women who retired were most likely to change from being 'inactive' to 'active'.
- Women who reported a significant change (increase) in work conditions (hours, conditions, responsibilities), were more likely to become 'inactive'.
- Experiencing menopause, divorce, death of a spouse or partner, spouse or partner retiring from work, and children leaving home, were not associated with physical activity level at Survey 3.
- Women who were 'active' at Survey 2 were more than 3 times more likely than their inactive counterparts to be 'active' at Survey 3.

" I used to be a reasonably good athlete always doing sport or exercising in some way, shape or form but since leaving school and finding employment I find it difficult to find the time to exercise and when I do, I either am too tired, have no energy and generally couldn't be bothered."



6 ACTIVITY, WEIGHT AND WELL-BEING

Relationships between BMI, PA and quality of life (as indicated by the PCS and MCS scores of the SF36) are shown for the Mid-age women in Figure 6.

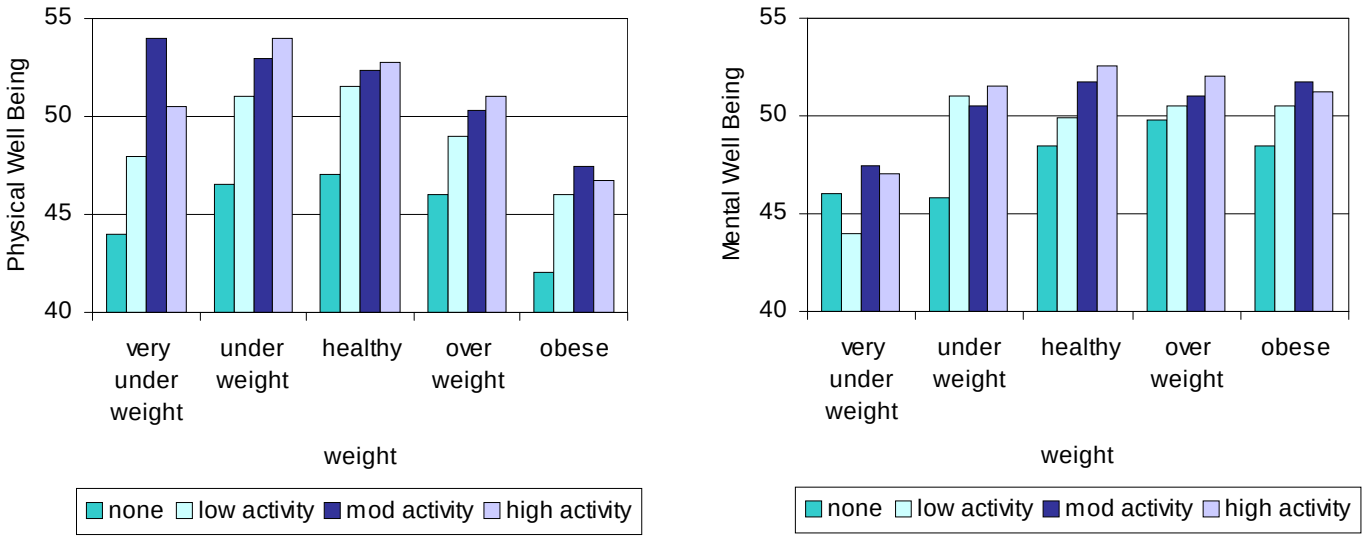
The data show that physical activity benefits quality of life, even among women who are not in the healthy weight range. Women who are moderately or highly active [included in the 'moderate' (dark blue) and 'high' (light blue) PA categories in this Figure], but who are in the underweight or overweight categories, report better physical health than women in the healthy weight category who are sedentary (PA category = 'none'). Women who are obese have the lowest physical health scores, regardless of activity category.

In relation to mental well-being, women who are at least moderately active (150 minutes a week), but who are not in the healthy weight range, score better than sedentary women with healthy weight. Similar patterns to those shown here for Mid-age women are evident among the Younger and Older cohorts.

These data suggest that being physically active will benefit all women, regardless of their shape and size.

"I am a little overweight now, but I'm active, I eat red meat for iron and plenty of vegies. It is not of concern to me, my weight. I know I'm not fat. But it is magazines which also influence girls. Very young girls need to be educated on healthy exercise and food ... by the time they do it at school (usually Year 10) it's too late. Exercise for enjoyment from an early stage and eating food which influence your whole life to live longer should be taught."

Figure 6. Average physical (PCS) and mental (MCS) quality of life scores for women in five different BMI categories and with four levels of activity in each.



7 ACTIVITY, WEIGHT AND SITTING

" As my work has become busier and more stressful over the last couple of years, I have had less time for exercise and I have paid less attention to my diet. Consequently I have put on weight - approx 2 stone."

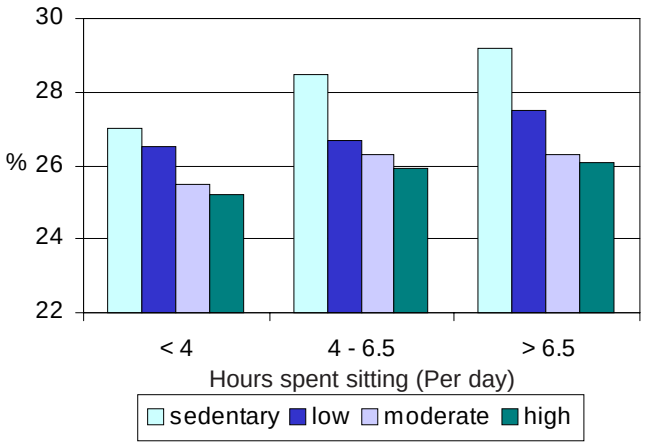
The associations between physical activity, sitting time and BMI were explored for the Mid-age cohort using Survey 3 data. Weekly physical activity was classified as 'sedentary' (0 – <10 mins/week), 'low' (10 - <150 mins/week), 'moderate' (150 - <300 mins/week) or 'high' (³300 mins/week). Average daily time spent sitting was categorised as low (<4 hrs/day), moderate (4 – 6.5 hrs/day) or high (>6.5 hrs/day).

The results show that mean BMI decreased significantly with increasing levels of physical activity in each sitting time group, and increased significantly with increasing levels of sitting in each PA group (see Figure 7).

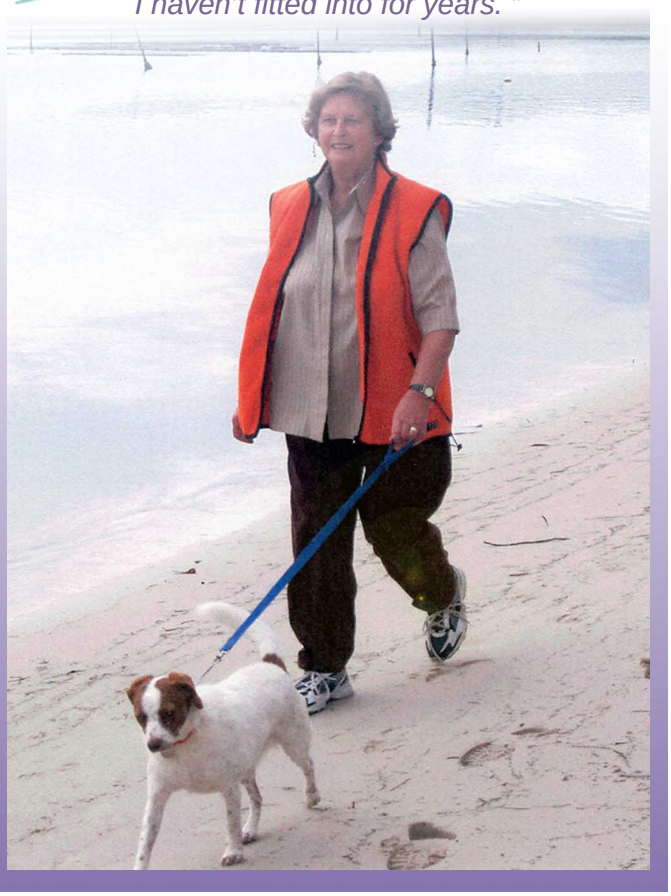
Among sedentary women, BMI increases markedly with increased sitting time. The effect of sitting time on BMI is not as marked among women who are moderately or highly active. This suggests that sitting time and leisure-time physical activity have combined effects on body composition, with participation in leisure-time physical activity partially counteracting the increase in BMI associated with prolonged periods of daily sitting. (All analyses were adjusted for income, education, language spoken at home, and smoking status).

These results indicate that women whose jobs involve long periods of sitting will not gain weight as long as they engage in some level of physical activity when they are not at work.

Figure 7. Mean Body Mass Index for Mid-age women in four PA categories, with low, moderate and high levels of daily sitting time.



" I never used to do any physical activity. Recently I got a dog and I walk every morning and every night. It is helping my blood pressure and I am getting into dresses I haven't fitted into for years. "

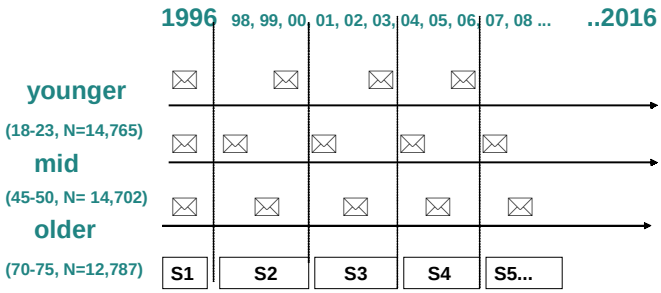


8 Background: What is the Australian Longitudinal Study on Women's Health?

The Australian Longitudinal Study on Women's Health (ALSWH) – widely known as Women's Health Australia - is a longitudinal population-based survey which is tracking the health of about 40,000 Australian women. It provides information that will assist the Commonwealth Department of Health and Ageing – and other Commonwealth and State Departments - to develop policies which are relevant for Australian women of all ages.

Women in three age groups (aged 18-23 years, 45-50 years and 70-75 years) were selected from the Medicare database in 1996. Sampling was random within each age group, with women from rural and remote areas sampled at twice the rate of women in urban areas. The study is designed to run for 20 years, with each age cohort surveyed every three years (see Figure 8).

Figure 8. Timeline for ALSWH Surveys



The cohorts were selected in order to follow women through life stages which are critical to their health and well-being. When the study began, the women in the Younger age group were in transition from adolescence to adulthood. They are being tracked as they move into the work force, enter adult relationships, and become mothers. At Survey 1, most were living with their families of origin (51%) or in shared housing (24%). Almost half (48%) were students; 79% were single; and 92% had no children. By Survey 2, 48% were married or in de facto relationships, although only 17% were mothers. Two-thirds (67%) had post-secondary educational qualifications and 59% were in full-time paid employment.

Women in the Mid-age group were selected to explore issues relating to menopause, and the social and personal changes of middle age. At Survey 1, 75% were married; 37% had full-time employment and 31% part-time. While 91% were mothers, only 58% had children under 16 living with them. Middle age is a time of relative stability, so the picture was similar at Survey 3, with 78% married, 37% in full-time work and 23% in part-time work, although the number with children living at home had fallen to 37%.

Women in the Older group were in their early 70s when selected. The focus in this cohort is on predictors of continuing well-being and independence in older adult life. At Survey 1, the majority of older women (58%) were married, but the proportion of women who were widowed increased from 36% to 41% of the sample by Survey 2. More than 80% of this cohort are pensioners, though 35% of these have superannuation or other income.

The study goes beyond a narrow perspective that equates women's health only with reproductive and sexual health. It takes a comprehensive view of all aspects of health throughout life, including:

- Physical and emotional health (including health-related quality of life, diseases and conditions, symptoms)
- Use of health services (GP, specialist and other visits, access, satisfaction)
- Health behaviours and risk factors (diet, activity, smoking, alcohol, other drugs)
- Time use (including paid and unpaid work, family roles, and leisure),
- Socio-demographic factors (education, employment, family composition)
- Life stages and key events (such as childbirth, divorce, widowhood).

Participants are also invited to consent to linkage of survey responses with unit records from the Medicare database, which provide information about type of service, characteristics of the provider, and out-of-pocket costs for Medicare-eligible services. Women can also be asked to participate in sub-studies which provide more in-depth information about specific health issues.

The information in this report was compiled by Wendy Brown and the ALSWH team

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