University of Wollongong

Research Online

Faculty of Social Sciences - Papers (Archive)

Faculty of Arts, Social Sciences & Humanities

2013

The asthma knowledge and perceptions of older Australian adults: Implications for social marketing campaigns

Uwana Evers

University of Wollongong, uke983@uowmail.edu.au

Sandra C. Jones

University of Wollongong, sandraj@uow.edu.au

Peter Caputi

University of Wollongong, pcaputi@uow.edu.au

Donald C. Iverson

University of Wollongong, iverson@uow.edu.au

Follow this and additional works at: <https://ro.uow.edu.au/sspapers>

Part of the [Education Commons](#), and the [Social and Behavioral Sciences Commons](#)

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library: research-pubs@uow.edu.au

The asthma knowledge and perceptions of older Australian adults: Implications for social marketing campaigns

Abstract

Objective: The purpose of this research is to gain an understanding of the asthma perceptions of older adults and identify gaps in their asthma knowledge. **Methods:** In regional New South Wales, Australia, a stratified, random sample of 4066 adults, aged 55 years and over, both with and without an asthma diagnosis, completed a survey based on the Health Belief Model about asthma knowledge and perceptions. **Results:** Almost half of the sample had experienced symptoms of breathlessness in the past four weeks. Breathlessness was a predictor of lower health ratings and poorer mood. Older adults reported low susceptibility to developing asthma. The sample demonstrated poor knowledge of key asthma symptoms including shortness of breath, tightness in the chest and a cough at night. **Conclusion:** There is a general lack of asthma awareness in this age group. This could result in not seeking medical help, and thus a reduced quality of life. **Practical Implications:** Older adults should be made aware of key symptoms and the prevalence of asthma in the older adult population, and be empowered to take control of their respiratory health. Audience segmentation for an intervention should be based on recent experience of breathlessness and asthma diagnosis.

Keywords

knowledge, perceptions, older, campaigns, implications, australian, marketing, social, asthma, adults

Disciplines

Education | Social and Behavioral Sciences

Publication Details

Evers, U., Jones, S. C., Caputi, P. & Iverson, D. (2013). The asthma knowledge and perceptions of older Australian adults: Implications for social marketing campaigns. *Patient Education and Counseling*, 91 (3), 392-399.

Evers U, Jones SC, Caputi P, Iverson D (2013). The asthma knowledge and perceptions of older Australian adults: Implications for social marketing campaigns. *Patient Education and Counseling*, 91(3), 392-399. doi: 10.1016/j.pec.2012.12.011

Authors

Uwana Evers

Centre for Health Initiatives, University of Wollongong, Wollongong, Australia

Sandra C. Jones

Director, Centre for Health Initiatives, University of Wollongong, Wollongong, Australia

Peter Caputi

School of Psychology and the Centre for Health Initiatives, University of Wollongong, Wollongong, Australia

Don Iverson

Director, Illawarra Health and Medical Research Institute and Pro Vice-Chancellor (Health), University of Wollongong, Wollongong, Australia

Corresponding author at:

Uwana Evers

Centre for Health Initiatives

University of Wollongong

ITAMS Building 233.G14

Innovation Campus, Squires Way

Fairy Meadow, NSW 2522

AUSTRALIA

Phone: +61 422 039 990

Fax: +61 2 4221 3370

Email: uwana@uow.edu.au

Acknowledgements

The study was supported by the Australian Research Council, in collaboration with the Asthma Foundation NSW. The electoral roll data was supplied by the Australian Electoral Commission in conformity with sections 91(4 A)(e) and 91(2 A)(c) of the Commonwealth Electoral Act 1918 and regulation 10 of the Electoral and Referendum Regulations.

The asthma knowledge and perceptions of older Australian adults: Implications for social marketing campaigns

Abstract

Objective: The purpose of this research is to gain an understanding of the asthma perceptions of older adults and identify gaps in their asthma knowledge.

Methods: In regional New South Wales, Australia, a stratified, random sample of 4,066 adults, aged 55 years and over, both with and without an asthma diagnosis, completed a survey based on the Health Belief Model about asthma knowledge and perceptions.

Results: Almost half of the sample had experienced symptoms of breathlessness in the past four weeks. Breathlessness was a predictor of lower health ratings and poorer mood. Older adults reported low susceptibility to developing asthma. The sample demonstrated poor knowledge of key asthma symptoms including shortness of breath, tightness in the chest and a cough at night.

Conclusion: There is a general lack of asthma awareness in this age group. This could result in not seeking medical help, and thus a reduced quality of life.

Practical Implications: Older adults should be made aware of key symptoms and the prevalence of asthma in the older adult population, and be empowered to take control of their respiratory health. Audience segmentation for an intervention should be based on recent experience of breathlessness and asthma diagnosis.

1. Introduction

Asthma is a chronic disease characterized by inflammation of the airways. This inflammation causes recurring episodes of breathlessness, coughing, tightness in the chest, and wheezing that are typically coupled with narrowing of airways¹. Despite the general perception that asthma is a childhood disease, it does develop in older adults^{2,3}.

1.1. Asthma in older adults

There are approximately 420,000 Australian adults aged 55 years and over with a diagnosis of asthma, that is, at least 1 in 10 older adults live with the condition¹. However, the Australian Centre for Asthma Monitoring believes that there may be many more older Australians living with undiagnosed, and therefore uncontrolled, asthma. One study found that over 25% of Australian older adults reported shortness of breath, and more than 20% experienced wheezing; however, only 14% had been diagnosed with asthma and 8.2% were self-managing with medication⁴. The literature demonstrates that asthma is under-diagnosed, often misdiagnosed, and under-treated in the older adult population in Australia^{2,5-7} as in other countries⁸⁻¹¹.

The risk of dying from asthma increases with age¹². Asthma has a negative impact on quality of life, with years lost due to disability accounting for approximately 70% of the asthma burden in older adults¹². While undiagnosed or uncontrolled asthma poses significant health consequences for older adults, their knowledge and beliefs about asthma are largely unknown.

1.2. Asthma knowledge and perceptions of older adults

Little is known about the asthma knowledge of older adults in the general community. While studies have measured community-wide asthma knowledge^{13,14}, they have not specifically focused on older adults. Small-scale, qualitative studies have examined the asthma knowledge of older adults with¹⁵ and without¹⁶ asthma, though these findings have limited generalizability. It appears that older adults tend to associate asthma with childhood¹⁶. They form their perceptions about asthma from

the experiences of their children or grandchildren who have had the disease, or from their own experience of having had it as a child. This association leads to the perception that adults cannot get asthma without having had it as a child. Furthermore, there is the perception that the health consequences for children with asthma are more serious than those for adults¹⁶.

Asthma-related health promotion has been primarily aimed at children and their caregivers. However, there is a demonstrated need for community-focused asthma awareness campaigns targeting older adults¹⁷. Health communications aimed at changing health perceptions and knowledge are often the first step in enacting health behavior change for individuals and the wider community¹⁸. In this way, a focus on changing the current asthma perceptions and attitudes of older adults has the potential for eliciting future health behavior change. Recent reviews on health promotion programs directed at older adults provide valuable insight into how to best change their health perceptions and, subsequently, their health behaviors^{19,20}.

1.3. The Health Belief Model (HBM) and social marketing in health promotion

Over the past few decades, the Health Belief Model (HBM)²¹ has been widely employed in health promotion efforts with varying degrees of success^{22,23}. The HBM integrates components that impact on behavior: perceptions of susceptibility to and severity of a disease, cues to taking recommended action, perceptions of barriers to and benefits of taking action, and self-efficacy²⁴. The combination of perceived susceptibility and perceived severity indicates the threat an individual perceives that a particular disease poses to their health. The cumulative effect of self-efficacy, and the barriers to and benefits of taking a prescribed action, represents an individual's expectations about the outcomes of taking action, and signifies the likelihood of that individual undertaking a specific health behavior. The HBM has shown particular usefulness when applied in the formative stages of program development to better understand the beliefs of a target population^{22,23}.

Social marketing provides a framework to develop, implement and evaluate health promotion efforts²⁵. It has been utilized effectively in public health²⁶ and specifically with older adult

populations^{27,28}. French and Blair-Stevens²⁹ outline eight essential elements for social marketing programs: segmentation, insight, methods mix, customer orientation, behavior, theory, exchange, and competition. Many of these elements are aligned with the constructs of the HBM. For example, the exchange element in the social marketing framework which refers to valued benefits gained versus costs incurred by the target audience relates directly to the HBM concept of barriers and benefits of undertaking a prescribed behavior. In combination, the HBM constructs and the social marketing framework are well suited to underpin a health promotion program directed at older adults.

A recent study integrated the components of the HBM with the social marketing framework to better understand the beliefs and behaviors of older adults¹⁶. Participants perceived that asthma was not very serious and that it would not impact their daily activities. Their perceived susceptibility was low; they believed that asthma was a childhood disease and that respiratory difficulties were a normal sign of ageing. Barriers to action centered on their lack of understanding about asthma. There were no clear benefits perceived by the participants regarding seeking diagnosis of and treatment for asthma. Cues to action were media campaigns, and advice from GPs, pharmacists and credible health organizations. The marketing mix synopsis highlighted the key role of GPs and pharmacists in terms of place, price, and promoting the product of respiratory health and achieving a higher health-related quality of life. Thus, the combination of psychological theory and social marketing techniques has the potential to guide the design of effective campaigns; this combination provides the foundation for the current research.

1.4. The current study

The aims of this study were to describe the asthma perceptions, and identify gaps in the asthma knowledge, of older adults in a regional Australian community. Two specific research questions underlie these aims:

(1) What are the asthma perceptions and knowledge of older Australians?

(2) How do these perceptions relate to the HBM and the social marketing framework?

2. Methods

2.1. Survey Development

A survey was developed to examine asthma knowledge and perceptions, asthma-specific self-efficacy, experience of breathlessness, general health ratings, and use and perceived credibility of various health information sources. Relevant demographic data were also collected. These variables were chosen to provide data on the asthma perceptions and knowledge of older adults, and to enable an adequate description and subsequent segmentation of the target population. Asthma knowledge was measured using a modified version of the Chicago Community Asthma Survey (CCAS-32)¹³. Previous studies have demonstrated the discriminant validity of the CCAS-32 in detecting differences between sub-populations¹⁴. As the CCAS-32 was validated using US data, three items were removed as they were deemed to be not relevant to an Australian sample (e.g. *“People without medical insurance do not get asthma care”*). The modified questionnaire contained 19 true/false or yes/no knowledge items, and 10 Likert-scale items assessing attitudes about asthma. Five items were developed on the basis of HBM constructs to measure perceived susceptibility to and perceived severity of asthma, general barriers to and benefits of visiting the doctor, and reasons for going to see the doctor. Two items on physical and emotional self-efficacy for coping with asthma were adapted from the Self-Efficacy for Managing Chronic Disease 6-Item Scale³⁰. These two self-efficacy questions were prefaced with the statement *“Please try to imagine what it would be like to have asthma. If you have asthma, please answer from experience”*. Two subscales from the Asthma Quality of Life Questionnaire (AQLQ)³¹, measuring breathlessness and mood on a 5-point Likert scale from “Not at all” to “Very severely”, were included in the questionnaire. The ten AQLQ questions were worded in a general sense, and were not asthma-specific. Cronbach’s alpha coefficient for these subscales was determined to be 0.86 (breathlessness) and 0.87 (mood). One

question assessed asthma diagnosis: *“Have you ever been told by a doctor or nurse that you have asthma?”*, one question examined perceived general health, and two questions on the use and perceived credibility of health information sources. The final questionnaire was reviewed by an expert panel. Ethics approval was obtained from the University’s Human Research Ethics Committee.

2.2. Sample and Data Collection

The survey was pilot tested with adults aged 55 years and over qualitatively ($n = 13$) to maximize readability and ease of use, and quantitatively ($n = 115$) to examine the psychometrics of the scales. Cognitive interviews were conducted with a convenience sample of 13 older adults. Seven participants had an asthma diagnosis, five were male and the age of participants ranged from 58 to 86. The 115 respondents of the quantitative pilot were recruited on intercity trains and ranged in age from 55 to 86 years ($M = 68.3$, $SD = 7.1$). Fifteen (14.6%) respondents had asthma; males accounted for 31.4% of the sample. On the basis of the pilot data analyses, changes were made to the order of survey items, item wording, and general formatting. The final survey was mailed to a random sample of 9,000 people aged 55 years and over who were registered on the Australian Electoral Roll from three demographically comparable regions in New South Wales, Australia (see Figure 1). Registration on the Electoral Roll is mandatory in Australia, thus our sampling frame was representative of the demographic, socio-economic, ethnic and cultural diversity of the older adult population from the selected regions. In order to maximize the response rate, a reminder postcard was mailed three weeks after the initial mail-out³². After another three weeks, a copy of the survey was sent to those who had not yet responded.

Figure 1. Response from the target population

2.3. Statistical Analyses

In addition to descriptive statistics, analyses of covariance (ANCOVA), multinomial logistic regression analyses and general linear modeling were performed to address the research questions and identify group differences in asthma perceptions, cues to action, and self-efficacy on the basis of age, gender, asthma diagnosis, experience of breathlessness and overall health rating.

3. Results

We received 4,131 completed surveys (response rate 46.8%), of which 4,066 were from respondents aged 55 years or older (Figure 1). The mean age of respondents was 67.9 ($SD = 9.0$) years; ages ranged from 55 to 96, and almost half (45.2%) of the respondents were male. Compared to population data, binomial tests showed that individuals with asthma (17.7% vs. 15.3%, $p < .001$) and

those born overseas (18.9% vs. 12.6%, $p < .001$) were over-represented in our sample, while those that primarily speak a language other than English at home (6.3% vs. 7.9%, $p < .001$) and individuals that identify as Aboriginal or Torres Strait Islander (1.1% vs. 3.4%, $p < .001$) were under-represented (Figure 1). Of those with asthma, 45.8% were diagnosed with the condition after the age of 45 years.

Recent experience of breathlessness was common in this sample of older adults (45.6%). Experience of breathlessness was determined by two or more symptoms experienced mildly, or one or more moderately, in the past four weeks. Approximately half the sample (47.8%) had experienced shortness of breath in the last four weeks, and about one third (33.6%) had experienced tightness in the chest.

The target population was divided into four segments on the basis of experience of breathlessness and asthma diagnosis (see Figure 2). These segments differed in mean age, sex ratio, asthma perceptions and proportion of the target population (Table 1). "*Strugglers*" were those who had recently experienced respiratory symptoms, but did not have an asthma diagnosis. "*Wheezers*" were those who had an asthma diagnosis and had recently experienced respiratory symptoms. The smallest group, "*Breathers*", referred to those who had an asthma diagnosis, but had no recent symptoms. *Breathers* highlighted the observation that less than 20% of those with asthma in our sample had their condition under control. "*Bloomers*" were those who had neither asthma nor symptoms. Alternative segmentations based on perceptions of susceptibility to, and severity of, asthma did not differentiate the audience groups on knowledge, perceived health, self-efficacy, and perceptions of asthma severity in a manner that facilitates intervention development.

		Symptoms of Breathlessness	
		NO	YES
Asthma Diagnosis	NO	Bloomers (47.8%)	Strugglers (34.8%)
	YES	Breathers (3.0%)	Wheezers (14.4%)

Figure 2. Audience segments by asthma diagnosis and symptoms of breathlessness

Table 1. Description of audience segments

Segment	STRUGGLERS	BLOOMERS	WHEEZERS	BREATHERS	TOTAL
Symptoms of breathlessness?	YES	NO	YES	NO	-
Asthma diagnosis?	NO	NO	YES	YES	-
<i>n</i> (%)	1,303 (34.8%)	1,792 (47.8%)	540 (14.4%)	112 (3.0%)	4066 (100%)
Mean age (<i>SD</i>); age range	69.3 (9.5); 55-96	66.4 (8.2); 55-96	67.5 (8.8); 55-94	65.2 (7.1); 55-84	67.9 (9.0); 55-96
% Male	47.8%	47.8%	36.7%	38.4%	45.7%

3.1. Profile of the Older Adult Population

Segment differences were found in relation to knowledge about asthma, perception of general health, and the use and perceived credibility of various health information sources.

3.1.1. Asthma Knowledge

Older adults demonstrated high overall asthma knowledge, with an average of 15 ($M = 78.9\%$) correct from 19 knowledge items. Most people knew that individuals could develop asthma as an adult without having had the condition as a child (87.2%) and that asthma is still present even when attacks subside (88.1%). There were, however, gaps in knowledge of major symptoms. Symptoms

that older adults did not correctly identify as being indicative of asthma were a cough at night (59.3% incorrect), tightness in the chest (47.9% incorrect) and shortness of breath (35.4% incorrect).

A univariate ANCOVA controlling for age and sex found significant differences in asthma knowledge between audience segments, $F(3, 2894) = 12.13, p < .001$; pairwise comparisons highlighted that *Wheezers* and *Breathers* had higher asthma knowledge scores than *Bloomers* and *Strugglers* (Table 2). Females ($M = 15.31, SD = 2.38$) had significantly higher asthma knowledge than males ($M = 14.57, SD = 2.45$). Asthma knowledge worsened as age increased, $F(1, 2894) = 69.33, p < .001$.

Table 2. *Segment differences in asthma knowledge, general health ratings, mood and self-efficacy*

Comparisons	Mean Difference	SE	95% CI	
			Lower Bound	Upper Bound
<i>Asthma knowledge</i> ^a				
Wheezers (<i>M</i> = 15.67) vs. Bloomers (<i>M</i> = 14.87)	.77**	.13	.51	1.03
Wheezers (<i>M</i> = 15.67) vs. Strugglers (<i>M</i> = 14.77)	.74**	.14	.47	1.01
Breathers (<i>M</i> = 15.31) vs. Bloomers (<i>M</i> = 14.87)	.36	.27	-.17	.89
Breathers (<i>M</i> = 15.31) vs. Strugglers (<i>M</i> = 14.77)	.33	.27	-.20	.86
<i>General health rating</i> ^b				
Breathers (<i>M</i> = 2.32) vs. Wheezers (<i>M</i> = 3.14)	-.82**	.09	-1.05	-.60
Breathers (<i>M</i> = 2.32) vs. Strugglers (<i>M</i> = 3.15)	-.82**	.08	-1.04	-.61
Bloomers (<i>M</i> = 2.44) vs. Wheezers (<i>M</i> = 3.14)	-.70**	.04	-.81	-.59
Bloomers (<i>M</i> = 2.44) vs. Strugglers (<i>M</i> = 3.15)	-.70**	.03	-.79	-.62
<i>Mood</i> ^c				
Breathers (<i>M</i> = 7.74) vs. Wheezers (<i>M</i> = 12.10)	-4.45**	.38	-5.47	-3.44
Breathers (<i>M</i> = 7.74) vs. Strugglers (<i>M</i> = 11.17)	-3.65**	.36	-4.61	-2.69
Bloomers (<i>M</i> = 8.10) vs. Wheezers (<i>M</i> = 12.10)	-4.01**	.18	-4.50	-3.52
Bloomers (<i>M</i> = 8.10) vs. Strugglers (<i>M</i> = 11.17)	-3.20**	.14	-3.56	-2.84
<i>Physical self-efficacy</i> ^d				
Breathers (<i>M</i> = 3.64) vs. Wheezers (<i>M</i> = 3.30)	.34*	.10	.07	.61
Wheezers (<i>M</i> = 3.30) vs. Bloomers (<i>M</i> = 2.94)	.36**	.05	.24	.49
Bloomers (<i>M</i> = 2.94) vs. Strugglers (<i>M</i> = 2.76)	.18**	.04	.08	.27
Strugglers (<i>M</i> = 2.76) vs. Breathers (<i>M</i> = 3.64)	-.88**	.10	-1.14	-.63
<i>Emotional self-efficacy</i> ^d				
Breathers (<i>M</i> = 3.56) vs. Wheezers (<i>M</i> = 3.33)	.23	.10	-.03	.50
Wheezers (<i>M</i> = 3.33) vs. Bloomers (<i>M</i> = 2.93)	.40**	.05	.27	.52
Bloomers (<i>M</i> = 2.93) vs. Strugglers (<i>M</i> = 2.76)	.18**	.04	.08	.27
Strugglers (<i>M</i> = 2.76) vs. Breathers (<i>M</i> = 3.56)	-.81**	.10	-1.01	-.56

* $p < .01$ ** $p < 0.001$

^a Higher mean scores refer to higher asthma knowledge. Range of possible scores: 0-19.

^b Higher mean scores refer to lower self-rated general health. A rating of 1 indicated “Excellent” perceived health and 5 indicated “Poor” perceived health.

^c Higher mean scores refer to lower mood scores. Range of possible scores: 5-25.

^d Higher mean scores refer to higher perceived self-efficacy. A rating of 1 (“Not at all confident”) indicated low self efficacy and a rating of 5 (“Extremely confident”) indicated high self efficacy.

3.1.2. General Health Rating

A univariate ANCOVA examined segment differences in perceived general health. Controlling for sex and age, the analysis showed that the segments differed in their health ratings, $F(3, 3696) = 223.43$, $p < .001$. Pairwise comparisons (Table 2) indicated that those with no recent experience of respiratory symptoms had significantly higher health ratings than those with respiratory symptoms. On average, *Bloomers* and *Breathers* rated their health as Good to Very Good, while *Strugglers* and *Wheezers* rated their health as Fair to Good.

A multinomial logistic regression predicting perceived health from audience segment found that experience of breathlessness and asthma diagnosis accounted for 20.2% of the variance in the overall health rating, controlling for age and sex, $\chi^2(20, N = 3702) = 833.64$, $p < .001$. *Bloomers* and *Breathers* were 49.8 times more likely than *Strugglers* and *Wheezers* to rate their health as “Excellent”, 19.5 times more likely to rate it as “Very Good”, seven times more likely to rate it as “Good” and twice as likely to report that their health was “Fair” (compared to the reference category “Poor”).

3.1.3. Psychological quality of life (mood)

A univariate ANCOVA controlling for sex and age examining the impact of breathlessness and asthma diagnosis on mood found that the four segments differed significantly in mood scores, $F(3, 3592) = 271.95$, $p < .001$. Mood worsened as respiratory symptoms increased. Pairwise comparisons showed that *Wheezers* and *Strugglers* had significantly worse mood scores than *Breathers* and *Bloomers*

(Table 2). Experience of breathlessness and asthma diagnosis accounted for 22.8% of the variance in mood.

3.1.4. Health Information Source Use and Credibility

The top five sources utilized for health information were the GP/doctor (93.3%), pharmacist (58.0%), the Internet (23.8%), brochures and pamphlets (22.8%) and television (19.3%). The rankings of source reliability were slightly different; the GP/doctor (95.2%), pharmacist (71.7%), nurse (33.1%), brochures and pamphlets (15.1%) and the Internet (13.3%).

3.2. Perceived Susceptibility

The perceived susceptibility to the development of asthma among those without diagnosed asthma was low. Most *Bloomers* (83.6%) and *Strugglers* (69.7%) considered themselves unlikely to develop asthma. More *Strugglers* (29.8%) than *Bloomers* (16.3%) responded that they were at least somewhat likely to develop asthma in the future.

A multinomial logistic regression that predicted perceived susceptibility to asthma highlighted differences in perceptions between the two groups without an asthma diagnosis, *Strugglers* and *Bloomers*, χ^2 (20, N = 3638) = 2170.78, $p < .001$. Not surprisingly, *Bloomers* were six times more likely than *Strugglers* to consider it “very unlikely” that they could develop asthma ($p < .001$), four times more likely to think it would be “unlikely” ($p < .001$) and twice as likely as those with breathlessness symptoms to consider it “somewhat likely” that they could develop asthma in the future ($p = .002$) (compared to the reference category “I have asthma”, the highest point on the scale of perceived susceptibility).

3.3. Perceived Severity

The majority (98.3%) of respondents both with and without asthma considered asthma to be a serious disease. Of the small proportion (1.7%) that did not consider asthma to be serious, the majority (1.0%) were individuals with an asthma diagnosis. A multinomial logistic regression

predicting perceived severity of asthma on the basis of age, sex and audience segment showed significant differences between segments based on asthma diagnosis, $\chi^2 (16, N = 3642) = 110.51, p < .001$. *Wheezers* were 10.9 times ($p < .001$) and *Breathers* 15.5 times ($p < .001$) more likely than *Bloomers* and *Strugglers* to rate asthma as “not serious”.

3.4. Self-efficacy

A general linear model predicting physical and emotional self-efficacy on the basis of audience segmentation found that self-efficacy differed significantly across the four segments, $F (3, 3633) = 66.07, p < .001$, partial $\eta^2 = .052$, controlling for age and sex. *Breathers* had the highest level of self-efficacy, as measured on a 5-point Likert scale, followed by *Wheezers*, *Bloomers* and *Strugglers*; the presence of an asthma diagnosis predicted higher asthma-specific physical and emotional self-efficacy (Table 2).

3.5. Reasons for, Barriers to and Benefits of Visiting the Doctor

Approximately one in 10 older adults in the sample visited their GP monthly. Over 50% visited their GP at least once every 3 months and more than 85% at least twice a year. *Wheezers* and *Strugglers* visited the doctor significantly more frequently than *Breathers* and *Bloomers* (Table 3). Table 3 also outlines segment differences in the cited reasons for barriers to and benefits of visiting the doctor regularly.

Table 3. *Reasons for, barriers to and benefits of visiting the doctor*

	Total	STRUG	BLOOM	WHEEZ	BREATH
<i>Frequency of GP visits over the past year</i>					
None**	3.3%	2.0	4.8	0.9	4.5
Once**	9.5%	5.3	13.9	3.2	17.9
2-3 times**	36.8%	30.4	44.4	24.8	45.5
4-11 times**	40.9%	48.9	32.5	52.4	26.8
12 or more times**	9.6%	13.4	4.4	18.7	5.4

<i>Reasons for visiting the doctor</i>					
Health check ups, screening, and prevention**	74.0%	74.5	78.7	68.8	70.5
If feeling unwell and not improving**	40.6%	44.3	36.4	51.5	40.2
If feeling extremely unwell	25.1%	25.0	25.4	28.1	33.9
As soon as the they begin to feel unwell**	10.4%	13.3	7.2	12.6	4.5
<i>Barriers to visiting the doctor</i>					
Nothing stops them from regularly visiting their GP**	60.6%	63.4	57.3	66.0	52.3
Thought that they did not need to go to the doctor**	28.2%	25.5	32.0	20.6	33.3
Unable to get an appointment**	10.3%	11.3	8.6	14.9	4.5
Time	7.6%	7.7	7.3	8.9	6.3
Cost*	4.5%	3.9	4.1	7.5	3.6
Did not want to hear bad news about their health*	2.2%	3.4	1.4	2.6	0.9
<i>Benefits of visiting the doctor</i>					
Monitoring existing health conditions**	67.7%	71.3	63.1	75.7	59.1
The GP knows them and their medical history**	65.4%	69.6	61.2	71.1	55.5
Preventative health and early detection of disease**	63.7%	58.8	67.9	61.0	66.4
Reviews of prescriptions**	59.6%	64.3	53.3	70.6	52.7
Advice on healthy living	21.5%	20.2	21.7	24.6	19.1
No benefit of regularly seeing the doctor	2.3%	2.2	2.4	1.9	4.5

$\chi^2 *p < .01$ ** $p < .001$

4. Discussion and Conclusion

4.1. Discussion

The prevalence of diagnosed asthma in the current sample was higher than official national records¹ and similar populations e.g. ³³, but comparable to other population studies examining respiratory symptoms in older adults e.g. ⁴.

To our knowledge, the current study was the first attempt to assess asthma knowledge in general populations of older adults, including those that may have undiagnosed asthma. Previous studies have examined asthma knowledge in older adults with an asthma diagnosis^{15,34}, or asthma knowledge in adults of all ages in the broader community^{14,35}. The current study supported the evidence that adults with an asthma diagnosis had higher asthma knowledge than those with no diagnosis, and that there is poor knowledge that a persistent cough at night can indicate asthma^{14,35}. Moreover, our findings support the lack of awareness specifically in older adults that shortness of breath and tightness in the chest are key asthma symptoms^{14,16}.

The presence of an asthma diagnosis was associated with poorer quality of life, supporting the findings of previous studies^{33,36,37}. Not previously examined in older adult populations, our findings build upon the evidence that experience of breathlessness alone, regardless of asthma diagnosis, is associated with poorer ratings of general health and worse health-related quality of life³⁸. Therefore, future studies examining health-related quality of life should control for experience of respiratory symptoms rather than merely the presence or absence of diagnosed respiratory diseases.

Expanding on the small, qualitative study conducted by Andrews and Jones¹⁶, the current study was large-scale (n = 4,066) and quantitative in nature. Like Andrews and Jones, we structured our study on the constructs of the HBM. However, the current study extended their findings to apply more broadly than the marketing mix, including in depth analyses of other social marketing elements; specifically, audience segmentation and message development. Unlike the findings of Andrews and Jones¹⁶, almost all of our sample reported that asthma was a serious condition. Both studies found that older adults did not perceive that they were particularly susceptible to developing asthma. This suggests that older adults consider asthma to be serious for other populations (children, for example), but do not believe that asthma could have serious implications for their own health.

4.1.4 Limitations

While the sampling frame was representative of the wider population and almost half of the sampled population participated in the study, we acknowledge that the dataset may contain a response bias, where respondents could have different perceptions and knowledge about asthma than non-respondents. Individuals with asthma were more likely to respond; shown by the higher than expected proportion of those with diagnosed asthma. While some of these individuals received their diagnosis in childhood, 82.8% of individuals with an asthma diagnosis had experienced recent symptoms. Lastly, culturally and linguistically diverse individuals were under-represented in the sample.

4.2. Conclusion

Data from a large-scale survey provided valuable information about the asthma perceptions and knowledge of older Australian adults. There is a general lack of asthma awareness in this age group, both in terms of asthma knowledge and perceptions of susceptibility to the disease. For those with undiagnosed asthma, this could result in not seeking medical help, and consequently, a reduced health-related quality of life. The findings suggest that the majority of older adults with an asthma diagnosis do not properly manage their symptoms. Even more concerning is that 5.3% of older adults with an asthma diagnosis do not consider it a serious disease. In Australia, this means that over 20,000 older adults may not be treating their asthma seriously. Almost half of the older adults in our sample had recently experienced symptoms of breathlessness; they had significantly worse health ratings and mood than those without recent respiratory symptoms. Older adults with an asthma diagnosis had higher asthma knowledge and higher perceived self-efficacy to manage asthma. Future research could utilize these findings as a foundation for the development of asthma awareness social marketing interventions targeting older adults with recent symptoms of breathlessness, encouraging them to take control of their respiratory health.

4.3. Practice Implications

The synthesis of the findings could be used to guide the development of social marketing interventions. The eight social marketing elements²⁹ have been addressed in this study; the HBM was the behavioral *theory* underpinning this research, examining the *behavior* of visiting the doctor. Involvement of members of the target audience has ensured a *consumer orientation*, and has enabled the identification of health benefits valued by older adults (*exchange*) and factors competing for their attention (*competition*). The remaining three of the eight social marketing benchmark criteria – audience *segmentation*, message development through consumer *insight*, and the *marketing mix* – are discussed further below (Table 4). The combination of these new insights

into the asthma perceptions of older adults provides a foundation for the development of targeted and tailored community asthma interventions.

Table 4. *Implications for the development of an asthma promotion intervention for older adults*

Social Marketing Element	Application of study findings to an asthma intervention tailored to older adults
Segmentation	<ul style="list-style-type: none"> • Populations should be grouped according to diagnosis of asthma and recent symptoms of breathlessness. • <i>Strugglers</i> have recently experienced respiratory symptoms and do not have an asthma diagnosis. <i>Wheezers</i> have an asthma diagnosis and have recently experienced respiratory symptoms. <i>Breathers</i> also have an asthma diagnosis, but have no recent symptoms. <i>Bloomers</i> have neither asthma nor symptoms. • These distinct groups differ on their asthma knowledge and perceptions, general health ratings, mood and perceived self-efficacy. Interventions should specifically target <i>Wheezers</i> and <i>Strugglers</i>.
Insight	<ul style="list-style-type: none"> • While almost a third of <i>Strugglers</i> consider it at least somewhat likely that they could develop asthma, their knowledge of asthma symptoms is poor so they may not associate the symptoms they are experiencing with asthma. Intervention messages directed at <i>Strugglers</i> should draw attention to typical asthma symptoms, and draw parallels to everyday activities that may be more difficult due to respiratory problems. • <i>Wheezers</i> know they have asthma, but a small portion do not think it is serious, even though they experience respiratory symptoms. Messages targeting <i>Wheezers</i> should focus on the activities that they may be missing out on due to poorly controlled asthma, and encourage them to take control. • Focus groups could provide further insight into target audience's reactions to, and opinions of, campaign materials and messages.
Marketing Mix	<ul style="list-style-type: none"> • The product offered by interventions should be a life not hindered by respiratory symptoms; encouraging <i>Wheezers</i> and <i>Strugglers</i> to control their symptoms and live the life they want to lead. • The price for individuals is the time and psychological burden of seeking asthma information. Making a call to a hotline or visiting a dedicated website would take time and, for <i>Strugglers</i>, the increased awareness that their respiratory symptoms might be asthma (or another condition) could cause concern. • Places such as medical centres, doctors' surgeries and pharmacies must be a part of the promotion strategy as they are important information channels to reach older adults.

The findings suggest that the target population can be meaningfully segmented on the basis of recent experience of breathlessness and asthma diagnosis. These segments differed significantly by key constructs of the HBM, including their asthma perceptions and perceived self-efficacy, and by their asthma knowledge, general health, mood, and media habits. Interventions about asthma for older adults would require distinct messages for *Wheezers* and *Strugglers* based on their different asthma perceptions and knowledge level. *Wheezers* know they have asthma, but do not properly manage the condition, so messages targeting *Wheezers* should highlight that they do not have to live

with respiratory symptoms that they can control. Messages to *Strugglers* should center on asthma awareness and encourage information-seeking behaviors. Where possible, interventions should tailor for age and gender differences in asthma perceptions and relevant health behaviors. The “marketing mix” refers to four controllable factors of a social marketing plan: product, price¹, place, and promotion. A product for individuals with breathlessness symptoms could be the ability to undertake valued activities that are only possible with improved respiratory health. The price could be calling an information line, visiting a website, or going to a doctor; not only because they take time and effort, but there is the possibility of being diagnosed with a condition. Medical centers, doctors’ surgeries and pharmacies should be places of promotion as they are important information channels to reach older adults with timely and personalized advice.

¹ The concept of price is similar to ‘barriers’ in health promotion frameworks.

References

1. Australian Centre for Asthma Monitoring. Asthma in Australia 2008. *Asthma Series 3*. Canberra: Australian Institute for Health and Welfare; 2008.
2. Jones SC, Iverson D, Burns P, Evers U, Caputi P, Morgan S. Asthma and ageing: an end user's perspective - the perceptions and problems with the management of asthma in the elderly. *Clinical & Experimental Allergy*. 2011;41:471-481.
3. Adams RA, Ruffin RE. Asthma can occur in the older person. *Medicine Today*. 2005;6(1):40-42, 44-45.
4. Abramson M, Matheson M, Wharton C, Sim M, Walters EH. Prevalence of respiratory symptoms related to chronic obstructive pulmonary disease and asthma among middle aged and older adults. *Respirology*. 2002;7:325-331.
5. Marks GB, Poulos LM. A nationwide perspective on asthma in older Australians. *Medical Journal of Australia*. 4 July 2005 2005;183(1):S14-S16.
6. Gibson PG, McDonald VM, Marks GB. Asthma in older adults. *The Lancet*. 2010;376:803-813.
7. Wilson D, Appleton S, Adams R, Ruffin R. Undiagnosed asthma in older people: an underestimated problem. *Medical Journal of Australia*. 2005;183(1):S20-S22.
8. Isoaho R, Puolijoki H, Huhti E, Kivelä S, Tala E. Prevalence of asthma in elderly Finns. *Journal of Clinical Epidemiology*. 1994;47(10):1109-1118.
9. Quadrelli SA, Roncoroni A. Features of asthma in the elderly. *Journal of Asthma*. 2001;38:377-389.
10. Braman SS, Hanania NA. Asthma in older adults. *Clinics in Chest Medicine*. 2007;28:685-702.
11. Stupka E, deShazo R. Asthma in seniors: Part 1. Evidence for underdiagnosis, undertreatment, and increasing morbidity and mortality. *The American Journal of Medicine*. 2009;122:6-11.
12. Australian Institute of Health and Welfare. Asthma among older people in Australia. Canberra: Australian Institute of Health and Welfare; 2010.
13. Grant EN, Turner-Roan K, Daugherty SR, et al. Development of a survey of asthma knowledge, attitudes and perceptions: the Chicago Community Asthma Survey. *CHEST*. 1999;116:178S-183S.
14. Weiss KB, Grant EN, Li T. The effects of asthma experience and social demographic characteristics on responses to the Chicago Community Asthma Survey-32. *CHEST*. 1999;116:183S-189S.
15. Shendell DG, Foster C, Sexton J, Roden J, Yamamoto N, Kelly SW. Knowledge and awareness of symptoms, triggers, and treatment among older adults with asthma and/or chronic obstructive pulmonary disease: community-based participatory research in a central California county. *Journal of Asthma & Allergy Educators*. 2011;2:81-90.
16. Andrews KL, Jones SC. "We would have got it by now if we were going to get it..." An analysis of asthma awareness and beliefs in older adults. *Health Promotion Journal of Australia*. 2009;20(2):146-150.
17. Barnard A, Pond CD, Usherwood TP. Asthma and older people in general practice. *Medical Journal of Australia*. 2005;183:S41.
18. Fishbein M, Cappella JN. The role of theory in developing effective health communications. *Journal of Communication*. 2006;56:S1-S17.
19. Lis K, Reichert M, Cosack A, Billings J, Brown P. Evidence-based guidelines on health promotion for older people. Vienna, Austria: Austrian Red Cross; 2008.
20. Windle G, Parsonage R, Prendergast L, et al. Health promotion for older people: a literature review. Bangor, Wales: University of Wales; 2003.
21. Rosenstock IM. Historical origins of the Health Belief Model. *Health Education Monographs*. 1974;2:328-335.
22. Glanz K, Bishop DB. The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health*. 2010;31:399-418.
23. Taylor D, Bury M, Campling N, et al. A review of the use of the Health Belief Model (HBM), the Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB) and the Trans-

- Theoretical Model (TTM) to study and predict health related behaviour change. London: University of London; 2006.
24. Janz NK, Champion VL, Strecher VJ. The health belief model. In: Glanz K, B.K. R, Lewis FM, eds. *Health Behaviour and Health Education*. 3rd ed. San-Francisco: Jossey-Bass; 2002.
 25. Kotler P, Lee NR. *Social marketing: influencing behaviors for good*. 3 ed. Thousand Oaks, CA: Sage Publications; 2008.
 26. Grier S, Bryant CA. Social marketing in public health. *Annual Review of Public Health*. 2005;26:319-339.
 27. Eadie D, Cohen L. A marketing strategy to increase awareness of oral and bowel cancer. In: Hastings G, ed. *Social marketing: Why should the devil have all the best tunes*. Oxford, UK: Butterworth-Heinemann; 2007:236-244.
 28. O'Brien B, Forrest D. PITSTOP - Men's health social marketing program. *Social Marketing Quarterly*. 2008;14:31-36.
 29. French J, Blair-Stevens C. *Big Pocket Guide: Social Marketing*. London: National Social Marketing Centre;2007.
 30. Lorig KR, Sobel DS, Ritter PL, Laurent D, Hobbs M. Effect of a self-management program for patients with chronic disease. *Effective Clinical Practice*. 2001;4:256-262.
 31. Marks GB, Dunn SM, Woolcock AJ. A scale for the measurement of quality of life in adults with asthma. *Journal of Clinical Epidemiology*. 1992;45(5):461-472.
 32. Dillman DA. *Mail and Internet Surveys: The Tailored Design Method*. 2nd ed. New York, NY2000.
 33. Enright P, McClelland R, Newman A, Gottlieb D, Lebowitz M. Underdiagnosis and undertreatment of asthma in the elderly. *Chest*. 1999;116(3):603-613.
 34. Goeman DP, O'Hehir RE, Jenkins C, Scharf SL, Douglass JA. 'You have to learn to live with it': a qualitative and quantitative study of older people with asthma. *The Clinical Respiratory Journal*. 2007;1(2):99-105.
 35. Malone AM, Gupta RS, Lyttle CS, Weiss KB. Characterizing Community-Based Asthma Knowledge in Chicago and Its High Risk Neighborhoods. *Journal of Asthma*. 2008;45(4):313-318.
 36. Adams RJ, Wilson DH, Taylor AW, et al. Psychological factors and asthma quality of life: a population based study. *Thorax*. 2004;59:930-935.
 37. Oğuztürk O, Ekici A, Kara M, et al. Psychological status and quality of life in elderly patients with asthma. *Psychosomatics*. 2005;46(1):41-46.
 38. Voll-Aanerud M, Eagan TML, Plana E, et al. Respiratory symptoms in adults are related to impaired quality of life, regardless of asthma and COPD: results from the European community respiratory health survey. *Health and Quality of Life Outcomes*. 2010;8:107-114.