



Understanding pre-, peri- and post-menopausal women's intentions to perform muscle-strengthening activities using the Theory of Planned Behaviour



Julie Doherty^a, Melanie Giles^b, Alison M. Gallagher^c, Ellen Elizabeth Anne Simpson^{b,*}

^a School of Psychology, Ulster University, Northern Ireland, UK

^b Psychology Research Institute, Ulster University, Northern Ireland, UK

^c Nutrition Innovation Centre for Food and Health (NICHE), Biomedical Sciences Research Institute, Ulster University, Northern Ireland, UK

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ABSTRACT

Although physical activity guidelines recommend muscle-strengthening activities (MSA), public health initiatives tend to focus on increasing aerobic activity and fail to mention MSA. This study sought to identify the issues influencing pre-, peri- and post-menopausal women's intentions to perform MSA with a view to informing future interventions for these populations. Mixed methods guided by the Theory of Planned Behaviour (TPB) were used to explore factors that influence women's intentions to perform MSA. In stage one, 34 women participated in either a focus group or interview. Discussions were transcribed verbatim and analysed based on menopausal status using a deductive approach. In stage two, 186 women ($M = 47$ years, $SD = 9$) completed a questionnaire to assess participant demographics, levels of MSA, affective and instrumental attitudes, injunctive and descriptive norms, self-efficacy and perceived behavioural control. Quantitative data were analysed using descriptive statistics, bivariate correlations, regression analyses and analysis of variances. Behavioural beliefs were: improved muscular health; psychological benefits; improved body shape. Normative beliefs were: health professionals; family members; work colleagues. Control beliefs were: equipment; motivation; time constraints; knowledge; physical capability; fear of judgement. However, these beliefs were not well established. Self-efficacy was the strongest predictor of intentions ($spc^2 = 0.11$) followed by affective attitudes ($spc^2 = 0.09$), with no significant differences on TPB variables between groups. If rising rates of musculoskeletal conditions in women are to be prevented, there is an urgent need to increase women's knowledge of recommended levels of muscle strengthening, with a view to promoting positive attitudes and enhancing women's sense of self-efficacy across all menopausal phases.

1. Introduction

1.1. Background

Rising rates of musculoskeletal conditions represents a major health burden [1], particularly for ageing women. In Europe, osteoporosis affects 22 million women aged 50+ while the prevalence of osteoarthritis [2], frailty [3] and sarcopenia rises steeply after women reach 50 years of age. The menopause contributes significantly to current trends, with research consistently showing that women are at risk of developing musculoskeletal issues due to a decline in bone mineral density [4], ovarian function and oestrogen that occurs as a result of the menopause [5]. According to previous research, muscle mass, strength and

physical function can be preserved by undertaking muscle-strengthening activities [6]. Consequently, activities to improve muscle strength were introduced as a core component of the physical activity guidelines (PAGs) in 2011 [7]. However, to elicit these benefits, adults are required to undertake MSA on at least two days each week with the recommendation that these activities should be undertaken in addition to aerobic physical activity.

Despite this, research to date has focused on the aerobic aspect of the PAGs with little reference to muscle strengthening; this is reflected in physical activity data. For example in the United Kingdom (UK), statistics are reported on the proportion of the population meeting recommended levels of aerobic physical activity yet rates of MSA are not. Consequently, little is known about the proportion of women

* Corresponding author at: Ulster University, Coleraine, Cromore Road, Co. Londonderry, BT52 1SA, UK.

E-mail addresses: Doherty-j16@email.ulster.ac.uk (J. Doherty), ml.giles@ulster.ac.uk (M. Giles), am.gallagher@ulster.ac.uk (A.M. Gallagher), ea.simpson@ulster.ac.uk (E.E.A. Simpson).

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undertaking MSA or the factors that influence their decision to perform this behaviour. However, evidence from the United States [8], Australia [9] and Scotland [10] suggests low adherence to this aspect of the PAGs, with older females least likely to undertake MSA. Therefore, to prevent or delay the onset of musculoskeletal conditions among women, there is a need to increase women's participation in MSA, particularly across menopausal phases (i.e. pre-, peri- and post-menopause).

Although interventions have become a popular method for promoting health behaviours including physical activity, research suggests these are more effective when derived using a theoretical framework [11]. The Theory of Planned Behaviour (TPB) [12] has been identified by National Institute of Health and Care Excellence as a framework to aid the development of complex interventions [13]. The TPB proposes that behavioural, normative and control beliefs underlie people's attitudes (i.e. "whether the person is in favour of performing the behaviour"), subjective norms (i.e. "whether the person feels social pressure to perform the behaviour") and perceived behavioural control (i.e. "whether the person feels in control of performing the behaviour"). Attitudes, subjective norms and perceived behavioural control are typically viewed as composite constructs however, it is acknowledged that attitudes comprise of affective (i.e. "feelings towards the behaviour") and instrumental (i.e. "whether performing the behaviour is beneficial") mechanisms, subjective norm consists of injunctive (i.e. "whether one believes it important that others want them to perform the behaviour") and descriptive components (i.e. "whether one's social networks perform the behaviour") while perceived behavioural control includes mechanisms related to controllability (i.e. "whether performing the behaviour is up to the individual") and self-efficacy (i.e. "an individual's confidence in their ability to perform the behaviour") [14,15]. These components are believed to form intentions and in turn determine behaviour when a sufficient degree of actual control exists [16]. Therefore, as a framework for behaviour change the TPB suggests that behaviour-related information should be explored and the relative importance of the TPB components identified. Combining this information provides a more in-depth understanding of the factors that influence people's intentions to perform specific behaviours. Consequently, interventions can be directed at one or more of these determinants with the aim of promoting positive deliberation and/or behavioural strategies that aid implementation of intentions [17].

While the TPB has been used as a framework to increase our understanding of intention formations for a wide range of behaviours [18,19], including strength training [20,21] research is yet to use the TPB to understand the issues influencing women's intentions to perform MSA across menopausal phases. If rates of musculoskeletal conditions are to be minimised and the implications of the menopause on muscular health reduced, it is important that these issues are understood. From this, TPB based interventions aimed at increasing levels of MSA during key transitional phases that predispose women to these conditions can be developed, with a view to preventing or delaying the onset of these conditions. Therefore, the aim of this study was to understand the issues influencing pre-, peri- and post-menopausal women's intentions to perform recommended levels of MSA using the TPB with a view to informing future interventions for these populations.

2. Method

2.1. Study design

This study was a mixed method sequential exploratory design using the TPB as a theoretical framework. Qualitative methodology was employed in stage one to understand the cognitive processes that underlies pre-, peri- and post-menopausal women's decision to performing MSA. While quantitative methodology was used to determine the TPB components that predict intentions and the relative importance of those predictors. These methods were combined to provide an in-depth

understanding of the factors that influence women's intentions to perform MSA.

2.2. Stage one: qualitative study

2.2.1. Participants

Women were recruited through community groups and organisations in Northern Ireland (NI) that were known to the researcher. Characteristics of menses and age were used to select participants based on menopausal status. Women < 48 years of age reporting regular menses were defined as pre-menopausal; women > 40 years of age but less than 55 years of age reporting irregular menses were defined as peri-menopausal; and post-menopausal was defined as cessation of menses for > 12 months due to the menopause. Menopausal status for those reporting a hysterectomy or use of contraception was determined based on the following criteria: pre-menopausal, < 48 years of age; peri-menopausal > 48 years but < 55 years of age; and post-menopausal > 55 years of age. Participants were excluded based on the following criteria: early menopause defined as cessation of menses < 40 years of age; self-reported bilateral salpingo-oophorectomy.

2.2.2. Measures and procedures

Potential participants were provided with an information sheet, consent form and a short questionnaire including sociodemographic items (i.e. age, level of education, marital status) and characteristics of menses (i.e. regularity of menses, time since previous menses and reasons for cessation). Once consent was obtained, participant's responses were reviewed to determine eligibility and menopausal status. Those meeting the inclusion criteria were invited to attend an interview or focus group depending on availability. During each discussion participants were provided with information on the recommended levels of MSA in line with the PAGs [7] and asked to share their views on undertaking weekly recommended levels of MSA using elicitation questions based on guidance provided by [16] or conducting exploratory TPB research. In total, nine interviews and six group discussions comprising two to eight participants were conducted by the researcher (JD). Length of discussions varied from 30 min to 1 h 10 min, were audio taped and transcribed verbatim.

2.2.3. Data analysis

Transcripts were subjected to thematic analysis, a method used within qualitative research to identify, analyse and report themes within data. In line with the procedures for thematic analysis, the transcripts were read several times (JD), to ensure familiarity and initial observations noted. Patterns in the data were identified and codes established and then refined [22]. The themes were named and assigned to their corresponding TPB constructs. A selection of transcripts were analysed by a second reviewer (EEAS) and an inter-observer agreement calculated by dividing the number of observed agreements by the number of judgements.

2.3. Stage two: quantitative study

2.3.1. Participants

Women were also recruited to this stage of the study through community groups and organisations in NI that were known to the researcher. Participants were selected based on menopausal status which was determined based on the characteristics described previously. The number of participants required was estimated using the following formulation $N = 50 + 8m$ (m is the number of Independent variables) [23]. Therefore, a minimum sample of ≥ 112 participants was considered acceptable.

2.3.2. Measures and procedures

A questionnaire was used to assess a two component model of the TPB. Three items per component were included and a seven point Likert

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