



## The impact of physical activity on psychological well-being in women aged 45-55 years during the Covid pandemic: A mixed-methods investigation

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**The impact of physical activity on psychological wellbeing in women aged 45-55 years during Covid: A mixed methods investigation.**

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## **Abstract**

Evidence suggests that being physically active may improve quality of life through the menopausal transition. This study is one of the first to investigate how meeting the UK Physical Activity Guidelines (PAG) impacts quality of life, stress, coping and menopausal symptoms in UK midlife women, aged 45-55 years, during the unfolding Covid pandemic (Phase 1 quantitative, n=164). The study also explored their motivation to undertake regular physical activity during Covid lockdown (Phase 2 qualitative, n=4). Explanatory sequential mixed methods design was used to collate quantitative (survey) and qualitative (focus group) data. Participants who met PAG experienced fewer depressive symptoms and perceived stress, had better physical and mental health and quality of life, than women who did not. This was supported by focus group discussions reporting lack of facilities, time constraints, reduced social support and existing health complaints as barriers to physical activity. Factors motivating women to exercise during Covid lockdown were benefits for physical and mental health, and support from friends (Qualitative). Women are postmenopausal for one third of their lives, health interventions need to promote positive healthy ageing around menopause. Menopausal changes could be used by clinicians as cues to action to promote female health and well-being. Clinicians should be promoting the health benefits of exercise and making women aware of the importance of aiming to meet the PAG for optimal health benefits. Women should be encouraged to increase PA levels by making plans, setting goals and being supported and encouraged by exercising with friends or family, as a way to better control menopausal symptoms.

**Key words:** Menopause, menopausal symptoms, physical activity, Covid, quality of life, stress and coping

***Abbreviations:***

PAG = Physical Activity Guidelines

PA = Physical Activity

NHS = National Health Service

DHSS = Department for Health & Social Security

**Author contributions**

Mrs Kerry Lum: I declare that I contributed to the design of the study, recruitment, data collection, data analyses, wrote the paper, saw and approved the final version.

Dr Ellen E.A. Simpson: I declare that I contributed to the design of the study, analyses of results, write up and review of the paper and approved the final version.

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**Conflict of interest**

The authors declare that they have no conflict of interest.

**Ethical approval**

Ethical approval for the study was obtained through the Staff and Postgraduate Filter Committee.

**Data statement**

The data is not available at this time as it is confidential and we do not have permission to share it.

## 1 Introduction

The menopausal transition (MT) can last up to a decade, moving from pre-menopause, through peri-menopause and post-menopause, with symptoms such as hot flushes, night sweats, difficulty sleeping, low mood, increased anxiety, problems with memory or concentration; often most intensive during peri-menopause [1] but under-researched. Such symptoms can significantly impact on quality of life and well-being in women [2], coinciding with increased risk of chronic conditions such as osteoporosis [3] and cardiovascular disease [4]. Bodily changes with menopause transition may act as a “cues to action” to promote health [5] by providing a window of opportunity to encourage health promoting behaviours, such as physical activity (PA), that may enhance health and alleviate bothersome symptoms [6].

For many women, PA declines with age and remains lower than that reported for men across the lifespan [7]. The National Health Service (NHS) highlights just 24% of women aged 45-54 yrs in the UK met recommendations of 150 minutes per week of moderate activity, 75 minutes of vigorous activity; or a combination of the two; along with strength building exercises on at least two days per week [8,9]. Strength training was found to be an element of the PAG message, previously not understood by women [5], and tends to be overlooked by previous research. Yet regular PA prevents all-cause mortality [10], improves menopausal symptoms, mental and physical health and prevents chronic diseases, [5], particularly during the added pressures of Covid lockdown restrictions [11]. It should be considered as a treatment option for women during the menopausal transition to enhance and maintain health.

The first Covid Lockdown in the UK lead to restrictions on public movement, with sports facilities closed, impacting negatively on health and well-being, compounded further

by noted declines in PA levels [11,12]. Another study [13] reported levels of PA declined in some participants during the pandemic but rose for others. It would have been useful for this study to determine why PA levels changed. Adapting PA to incorporate home-based exercise, was essential to maintain physiological and psychological benefits of exercising [5] during forced periods of rest due to the pandemic.

There are few UK studies on PA in women at midlife, the current study will address this gap in the research. In non-pandemic studies, findings suggest in a sample of Polish women [14], PA reduced menopausal symptoms and further improved quality of life in post-menopausal women [15]. Similarly, an American study found that increased PA in menopausal women was related to lower reporting of depressive symptoms, better life satisfaction and positive mood [16]. An Iranian study found that by providing education and facilitation of opportunities for PA during menopause led to a reduction in menopausal symptoms over a 12-week PA intervention [17]. Similar findings were noted in a Mediterranean cross-sectional study reporting higher PA levels mediated quality of life by reducing bothersome vasomotor symptoms [15]. A recent systematic review suggests there is a need for more research looking at the impact of PA in women with menopausal symptoms on psychological well-being and quality of life [6]. Also to note, there has been little UK based research into the effects of regular PA on women aged 45-55 years against UK Physical Activity Guidelines (PAG) [9], particularly during the Covid pandemic. This is important as the recommendations are there to promote optimal health benefits and menopausal women should be encouraged to achieve the PAG.

This study addressed gaps in previous research highlighted above and adds to existing research conducted during the pandemic. Previously, research has focused

on quantitative *or* qualitative data collection, whereas the current study used an explanatory sequential mixed methods design [18] to gain a more holistic understanding [19] of PA in midlife women. The study aim was to determine if menopausal women meeting the UK PAG [9] would have better health, fewer menopausal symptoms, and general well-being than those that did not. The objectives were to investigate how PA levels impacts quality of life, stress, coping and menopausal symptoms in UK midlife women aged 45-55 years during the Covid pandemic (Phase 1- Quantitative – on-line survey). Also, to investigate what motivated those women to undertake regular PA during Covid lockdown (Phase 2- Qualitative).

## **2 Method**

### *2.1 Study Design*

Explanatory Sequential Mixed Methods design [18] was used to collate quantitative and qualitative data, to understand impacts of meeting PA guidelines (Independent Variable) on menopausal symptoms, perceived stress, coping and quality of life (Dependent Variables) (quantitative); and establish motivations *why* women chose to partake in PA (qualitative). Issues arising from phase one - survey completion (quantitative) were raised as prompt questions in phase two – focus groups (qualitative), to gain fuller understanding.

### *2.2 Phase One: Quantitative - On-line Survey Study*

#### *2.2.1 Participants*



Females 45-55 years, representing peri-menopausal and post-menopausal phases. No inducements/rewards were offered. Adopting a moderate effect size of .4, significance of 0.05, power 80%, the sample size needed was 110 for 2 groups [20]. 10 Facebook support groups agreed to advertise a link to the survey.

### *2.2.2 Measures*

The on-line survey collected socio-demographic data (age, menstrual status, whether taking hormone replacement therapy, education level), menopause symptoms, PA, perceived stress, coping and quality of life. All measures are reliable and valid and have been used previously on menopausal women [21]. The following scales were incorporated into the survey:

***Menopausal symptoms.*** Green Climacteric Scale [22] is a 21-item measure used to measure vasomotor, somatic and psychological menopausal symptoms.

***Physical Activity.*** International Physical Activity Questionnaire (IPAQ) [23], plus an additional question about Strength Training (eg yoga, weight lifting, press-ups, heavy lifting). Participants were rated as 'High', 'Moderate', 'Low' according to IPAQ Guidelines. 'High'= vigorous activity (eg heavy lifting, digging, aerobics, or fast bicycling) on at least 3 days p/week or complete 7/7+ days of combination of vigorous, moderate (eg carrying light loads, bicycling, doubles tennis) and walking activity. 'Moderate'= not meeting criteria for 'High' and engaging in 3/3+ days of vigorous activity or 5/5+ days of moderate and/or walking activity, or 5/5+ days of any combination. 'Low' = 'Moderate' criteria not met. It was also used to determine who met PAG and who did not.

***Quality of Life.*** RAND 36 item short form survey (SF-36) assessed quality of life via 8 health concepts: "Physical functioning, role limitations due to physical health, role

limitations due to emotional problems, energy/fatigue, emotional wellbeing, social functioning, pain, general health” [24].

**Perceived Stress.** Perceived Stress Scale (PSS-14) [25] measured reflection on feelings and thoughts over the previous month, rating items on a 5-point Likert scale.

**Coping.** The Brief COPE [26], measured recently used coping strategies. 28 items rated on a 4 point scale. Brief COPE measured 3 types of coping: Emotion based (acceptance, emotional support, humour, positive reframing and religion), Problem focused (active coping, help and advice, planning); and Dysfunctional (behavioural disengagement, denial, self-distraction, self-blame, substance use, venting) [27].

### *2.2.3 Procedures*

Ethical approval for stage one and two of the study was gained from the School of Psychology Staff and Postgraduate Filter Committee, Ulster University. Permission was sought from Facebook support group administrators prior to recruitment postings. Participants received information sheets about the study and gave informed consent via electronic consent forms for both stage one and two. All participants were informed of their right to withdraw from the study at any time up to submission (online survey) and at any point before/during focus groups. Participants. They completed the Qualtrics on-line survey between 30<sup>th</sup> December 2019-11<sup>th</sup> May 2020. There was a low-level risk that participants may develop heightened awareness of their level of activity. Signposting to seek GP advice was provided. Data was stored confidentially and in accordance with GDPR. Participants expressing an interest in involvement in the Focus Groups were contacted by one of the researchers (KL) by email, they were sent a participant information sheet and consent form, which had to be completed and returned to the researcher prior to the online focus group commencing (Phase 2).

#### *2.2.4 Data Analyses*

Data was cleaned, checked and incomplete data removed (n=115) prior to analyses (n=164). Women meeting PAG thresholds were compared against women who did not, for perceived stress, coping, menopausal symptoms, and quality of life. Data was normally distributed, and SPSS was used to conduct one-way ANOVAs and post-hoc Bonferroni tests to analyse variables against menopausal status and IPAQ PA results. Independent t-tests were conducted to analyse variables against women meeting/not meeting PAG. Data was also analysed using Joint Display Analysis (JDA) summarising meta-inferences for qualitative and quantitative data integration [19].

### *2.3 Phase Two: Qualitative Study – Focus Groups*

#### *2.3.1 Participants*

13 females 45-55 years were recruited to take part in a focus group. Some participants had previously completed the online survey and others were recruited via links posted on 10 Facebook support groups. 2 participants took part in each of the 2 focus groups, totalling 4 participants overall.

#### *2.3.2 Materials*

Focus Group probe questions explored motivations as to *why* women partake in PA. 'Taking vitamin 'supplements', a topic arising from the survey was also included. Questions included: why women chose a certain level of PA, factors inhibiting them, exercising alone or with others, whether they considered intensity of PA or not in their decisions.

### *2.3.3 Procedures & Analyses*

Participants interested in taking part in the focus groups were emailed a date and Skype link to access the focus group. Two on-line Skype focus groups were facilitated by the researcher. Focus group 1 discussions ran for 45 minutes and focus group 2 discussions ran for 70 minutes. Participants gave informed consent (*see 2.2.3 above*) and agreed to the discussions to be audio recorded on two devices, for later analysis. Participant discussions were audible to all present throughout each of the two focus groups and 3 of the 4 participants allowed video cameras to be active during the discussions facilitated through Skype. The researcher used prompt questions to guide discussions. Thematic Analyses (TA) stages established the qualitative themes: familiarisation with data, generating initial codes, searching for themes, reviewing themes, defining, and naming themes, report themes.

## **3 Results**

### *3.1 Phase One: Quantitative Study Analyses – On-line survey assessing how PA impacts quality of life, stress, coping & menopausal symptoms in UK midlife women aged 45-55 years, during Covid lockdown*

*3.1.1 Sample description:* Volunteer sampling advertised via 10 Facebook menopause support groups yielded 279 women completing the on-line survey. 115 participants were excluded for partial completion or lack of consent, and analyses conducted on 164 participants.

*3.1.2 UK midlife women sociodemographic data:* including menopausal status, age, taking hormone replacement therapy can be found in Table 1. Most participants were peri- or post-menopausal and a third were taking HRT.

*3.1.3 Physical Activity – Group Differences based on women meeting or not meeting PAG, on Quality of Life, Stress & Coping*

Almost 58% of participants met UK PAG, meaning they reported 75/75+ minutes of vigorous activity, or 150 minutes of moderate activity (or combination of 150 minutes vigorous and moderate activity), plus at least 2 sessions of strength training p/week.

It was found that participants who met PAG (see Table 2) expressed lower depressive symptoms, lower psychological stress and better quality of life across all components of quality of life except 'Role Limitation emotion'. No differences were found for coping styles.

*3.2 Phase Two: Qualitative Study – To investigate what motivated midlife women aged 45-55 years to undertake regular PA during Covid lockdown*

Phase two explored participant motivations to engage in regular PA and how some women framed menopause as a positive opportunity for change. Thirteen women originally expressed an interest in taking part in focus groups, however 9 withdrew their interest at a later date, due to Covid related bereavement and technical problems.

Two Skype call focus groups were conducted, each with 2 participants, women represented north-west and south-east of the UK. Table 3 and 4 highlights sociodemographic information of this sample.

Thematic analysis of transcripts from the focus groups revealed 2 themes and 11 subthemes, (see table 5) at the point of data saturation as follows:

### *3.2.1 Theme A: Why women might not exercise.*

Phase 2 started as the UK entered Covid-19 Lockdown 1, impacting ability to exercise due to sports facilities closing.

A lack of time due to competing commitments was repeatedly cited for not exercising, along with a variety of reasons why women were not motivated to prioritise exercising. Lack of support from GPs, friends and family was also cited, as too were pre-existing health conditions, preventing regular PA.

### *3.2.2 Theme B: What motivates women to exercise.*

Participants were aware of the benefits of regular PA to lift mood, citing how PA helped them deal with grief and stress management.

Participants discussed benefits: helping arthritis, their bones, muscles, heart, weight management and general fitness. They discussed advice and support from other women being motivating, online/face-to-face. Organising clothing/equipment in preparation enabled women to execute exercise plans. As well as being a reason why women did not exercise, Covid-19 Lockdown was also cited as a motivating factor for them *to* exercise. Having a supportive workplace during menopause kept women 'on track'.

*3.3 Joint Display Analysis* highlights quantitative *and* qualitative findings from the mixed methodology study [19]. Colour coded quantitative phase findings in graphical form, relate to quotes from focus group recordings from the qualitative phase. Meta-inferences were drawn from the combined findings, highlighting overall outcomes of the mixed methods study (Fig 1)

## 4 Discussion

### 4.1 Key findings

Just over half of the sample of women aged 45-55 years in the current study reported meeting the PAG during Covid pandemic. This group reported better quality of life scores for all components of quality of life except 'Role Limitation emotion', fewer depressive symptoms and stress levels compared to women who engaged in little or no regular PA (table 2). Women rated higher for physical and mental areas of quality of life, having higher energy, better physical function, less physical role limitation, better emotional wellbeing and social function, less pain and better general health overall. There was no difference for coping styles and other menopausal symptoms.

Qualitative findings supported the quantitative phase by highlighting *why* women did/did not engage in regular PA during Lockdown. Thematic analysis established: 1) why women might not to partake in regular PA – due to lack of time, lack of motivation, lack of support, physical conditions and due to 'Lockdown'; and 2) what motivates women to partake in regular PA – psychological and physical benefits, advice, and support from others, being organised, impacts of 'Covid Lockdown' and having a supportive workplace. These findings are in keeping with more recent studies [15, 6].

### 4.2 Implications

This study contributes to the existing research reporting benefits of PA during the menopausal transition with additional information about the impact of Covid-19 Lockdown on PA in menopausal women. Not only does PA promote quality of life and well-being, but it may also offer an alternative to controlling depressive menopausal symptoms, supporting previous findings [16]. These findings are taken a step further by specifically noting these benefits in relation to meeting the UK PAG [28] during the

pandemic. Menopause and increased symptoms could be used as cues to action by clinicians to start a conversation around female health promotion, similar to previous findings on promoting walking in midlife women [29]. Interventions should be targeted at educating women about the UK PAG and the benefits of this for mental and physical health, adding to recommendations emphasising the need for increased PA in menopausal women to promote well-being [17]. Focus group discussions in the current study highlighted participants' vagueness about the PAG strengthening and conditioning exercises, highlighting a lack of understanding and supporting previous research [5]. More work may be needed around educating women on PAG and how to achieve these.

The motivators and barriers to PA provide insight into what and how to promote this more effectively in menopausal women, by overcoming barriers and utilising the motivators to encourage engagement and discussion of the PAG. Women in the current study discussed how planning exercise made it more likely they would carry it out, for example, creating a time during the day to exercise and being prepared for changes in the weather, supporting previous research around planning for lifestyle enhancement [30]. Motivators for PA could be used to emphasise the positive health benefits identified by women (bone, heart and joint health), better psychological well-being (improved mood and lower stress) and the encouragement and support for PA derived from friends and family and having a supportive workplace, are all facilitators of PA in this group. Lending further support to recent findings around barriers and facilitators to promoting walking in menopausal women [32]. Health care professionals have an opportunity to promote general health and well-being in menopausal women by discussing PA during the consultation process.



Barriers to PA reported in this study were similar to those reported in non-pandemic studies. The main reasons women did not partake in PA were lack of organisation and time, lack of support, lack of motivation and pre-existing physical health conditions. Lack of motivation could be a symptom of menopause relieved by exercise [30]. Interventions to increase self-confidence around PA enabled women to engage more in PA [31] and could be used to aid motivation. Musculo-skeletal health problems and other chronic conditions linked to age, were also discussed as another barrier. These are the very reason women *should* be engaging in more activity. Further qualitative research is needed with women experiencing physical constraints, to establish how they can be better empowered to meet 'Physical Activity for Disabled Adults' guidelines [9]. 'Ableism' acts as a regulatory mechanism to impact self-determination to partake in PA [32], therefore, ableism interventions may be useful.

The current study took place around UK Covid-19 Lockdown 1. Participants discussed impacts of Lockdown on motivation and ability to exercise. As found in other research [11], some women were engaging in more PA due to Lockdown, others less. One participant who had not been engaging in PA at all prior to Lockdown, had started long walks during Lockdown. Current data supporting benefits of regular PA on emotional wellbeing during lockdown, implying interventions emphasising wellbeing may be successful. Previous research suggested wellbeing could act as a source of resilience through the menopausal process [28] and during the pandemic. Mid-life is an opportune time of change for women which may trigger the need to do something positive about their health.

### *4.3 Strengths & limitations*

The current study used Explanatory Sequential Mixed Methods design [18], to explore impacts of physical activity in women experiencing menopausal transition, providing a clearer snapshot of the UK situation with which to inform NHS intervention. There had been few previous UK mixed methods studies on this topic using UK PAG conducted during the pandemic. Using women aged 45-55 years ensured participants were prime age for menopausal changes [33] and the study was adequately powered for the analyses conducted. Research regarding impacts of PA on well-being, had been less evidenced previously than research regarding general quality of life in menopausal women [29], the current study links this to PAG.

It is difficult to disentangle effects of menopause from regular psychopathology and the self-report nature of the survey meant women were subjectively rating symptoms and levels of activity. Using accelerometers and biophysical markers [34] would have addressed this. Participants were self-selected, volunteering through links on Facebook menopause support groups, attracting women specifically motivated to explore menopause. Additional alternative groups may have expanded findings, as would a longitudinal study over a 5-year period. These could be considered for future research. Focus groups yielded small participant numbers. Larger focus groups may have opened discussions further. More qualitative research is needed to support findings.

### *4.4 Clinical Recommendations*

Menopause provides an opportunity to promote and maintain health for longer in women and menopausal symptoms may act as cues to action. Clinicians may use this opportunity to intervene by educating menopausal women in the UK about the benefits

of PA and the need to meet UK PAG recommendations [9], including strength training and for women with disabilities to meet UK 'Physical Activities for Disabled Adults' [9]. Clinicians could support women with motivation interventions, increasing awareness of putting implementation plans in place to exercise. They could help women overcome barriers such as lack of time, the weather, the cost of going to the gym – consider green exercise, walking, cycling. They could facilitate social support from other women and generally support a positive rhetoric around menopausal transition and physical activity, which could positively impact the future health of women, reduce the onset of chronic conditions and the burden on the NHS. Doctors in Finland *prescribe* physical activity to menopausal women [35]. UK GPs and health practitioners could follow suit.

#### *4.5 Conclusion*

Women are menopausal for one third of their lives, we need to promote healthy ageing by emphasising the benefits of PA as a mediator for the negative impact on menopausal symptoms on quality of life and well-being. PA will help prevent the onset of chronic conditions and enable healthier living for longer, thereby reducing costs for the NHS. This study may impact future clinical practice and health intervention planning with menopausal women in the UK, especially during future lockdowns, by educating women about the importance of meeting PAG, including strength training, providing strategies to empower them to plan time and organise exercise, set personal challenges, be reflective about the benefits of PA and ensure they have support.

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**Table 1: Sociodemographic Participant Information Summary**

Age	M 49.88 yrs (SD 2.90)	
Menstrual Status	Pre- 18.9% (n=31)	Regular + 1 month
	Peri- 39.6% (n=65)	Irregular + 1-11 months
	Post- 41.5% (n=68)	No periods + more than year
Taking HRT	Yes 32.3% (n=53)	No 67.7%

*N=164, Pre= 'Pre-menopausal' = 'regular' periods, last period 1 month ago; Peri = 'Peri-menopausal' = 'irregular' periods last period 1-11 months ago; Post = 'Post-menopausal' = 'no periods' last period at least a year ago [5]. HRT= hormone replacement therapy.*

**Table 2: Quantitative Survey Analysis – Physical Activity Guidelines PAG (UK), re: Menopausal Symptoms, Quality of Life, Stress & Coping**

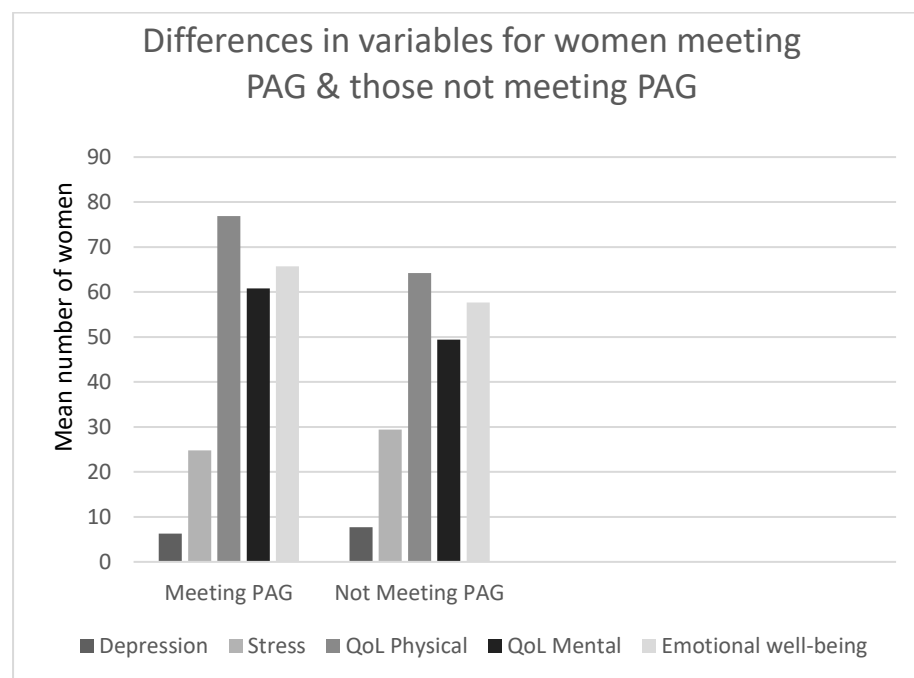
<b>PAG Results</b>	<b>Not Meeting (n=69)</b>	<b>Meeting (n=95)</b>	<b>Stat Analysis</b>		
<b>Menopausal Symptoms</b>	<b>M (SD)</b>	<b>M (SD)</b>	<b>df</b>	<b>t</b>	<b>p</b>
Psychological	15.0 (7.4)	13.0 (6.6)	(162)	1.868	.064
Somatic	5.4 (4.3)	4.9 (3.4)	(161)	.876	.382
Vasomotor	4.0 (2.4)	4.4 (2.6)	(162)	-.841	.402
Anxiety	7.4 (4.0)	6.9 (3.5)	(162)	1.137	.257
Depression	7.7 (4.0)	6.3 (3.6)	(162)	<b>2.359</b>	<b>.020*</b>
<b>Quality of Life</b>					
Physical Function	78.0 (24.6)	90.7 (14.9)	(162)	<b>-4.107</b>	<b>.000***</b>
Role Limitation Physical	60.5 (39.9)	77.1 (33.6)	(162)	<b>-2.888</b>	<b>.004***</b>
Role Limitation Emotion	45.9 (42.1)	57.2 (43.1)	(162)	-1.674	.096
Energy	31.2 (19.7)	47.2 (21.1)	(162)	<b>-4.900</b>	<b>.000***</b>
Emotional Well-Being	57.7 (20.0)	65.7 (17.5)	(162)	<b>-2.724</b>	<b>.007**</b>
Social Function	62.9 (24.8)	73.2 (21.4)	(162)	<b>-2.842</b>	<b>.005***</b>
Pain	63.6 (26.2)	74.4 (20.3)	(162)	<b>-2.975</b>	<b>.003***</b>
General Health	54.9 (20.6)	65.5 (20.2)	(162)	<b>-3.297</b>	<b>.001***</b>
Physical Component Score	64.2 (22.8)	76.9 (17.4)	(162)	<b>-4.050</b>	<b>.000***</b>
Mental Component Score	49.4 (22.0)	60.8 (21.9)	(162)	<b>-3.268</b>	<b>.001***</b>
<b>Stress</b>	29.4 ( 8.5)	24.8 ( 8.8)	(162)	<b>3.370</b>	<b>.001***</b>
<b>Coping Styles</b>					
Emotion Focus	21.5 ( 5.7)	20.9 ( 5.4)	(162)	.743	.459
Problem Focus	14.6 ( 4.7)	14.8 ( 4.3)	(162)	-.309	.758
Dysfunctional Focus	21.7 ( 5.4)	20.2 ( 5.8)	(162)	1.637	.104

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

*Quality of Life – Physical Component Score is a composition of: Physical Function, Role Limitations due to Physical Health, Pain and General Health. Mental Component Score is a composition of: Role Limitations due to emotional Problems, Energy, Emotional Well-being and Social Functioning.*

## **Fig 1: Combined Quantitative & Qualitative Summary of Main Findings**

JDA highlights findings from both phases of the study, detailing differences for depressive symptoms, perceived stress, quality of life and emotional well-being; between women meeting/not meeting UK PAG.



*Key: PAG - UK Physical Activity Guidelines, QOL – Quality of Life*

### **Qualitative Quotes:**

Depression: “Exercise is good for grief”

Stress: “Digging...it just helps stress levels for me”

QOL Physical: “I’ve upped the amount of tennis I’m doing because I’m very conscious of osteoporosis”

QOL Mental: “I feel better for it afterwards” “It’s definitely more calming to do some exercise of some sort”

Emotional Well-being: “Sometimes you don’t want to be with a friend, you just wanna be with a complete stranger...like a running buddy or a swimming buddy”

### **Meta Inferences:**

Participants meeting PAG experienced less depressive symptoms and stress, and better physical and mental quality of life, including better emotional well-being; than women who did not meet PAG.

**Table 3: Phase 1 – Participant Information Summary**

<b>Age</b>	M 49.88 yrs (SD 2.90)	
<b>Menstrual Status</b>	Pre- 18.9% (n=31)	Regular + 1 month
	Peri- 39.6% (n=65)	Irregular + 1-11 months
	Post- 41.5% (n=68)	No periods + more than year
<b>Taking HRT</b>	Yes 32.3% (n=53)	No 67.7%

*N=164, Pre=Pre-menopausal, Peri=Peri-menopausal, Post=Post-menopausal, HRT=hormone replacement therapy*

**Table 4: Phase 2 - Sociodemographic Participant Information Summary**

<b>Focus Group Duration</b>	<b>Age</b>	<b>Menopausal status</b>	<b>Taking HRT</b>	<b>Employment</b>	<b>Location</b>
Focus Grp 1: 45 mins 5 secs	50	Peri	No	Not employed	South-east UK
	45	Peri	Yes	Employed	North-west UK
Focus Grp 2: 70 mins 10 secs	54	Post	No	Employed	North-west UK
	46	Peri	No	Self-employed	South-east UK

*N= 4, Peri=Peri-menopausal, Post=Post-menopausal, HRT= hormone replacement therapy*

**Table 5: Summary of themes and subthemes identified from Focus Groups**

Theme Title	A. Why women might not exercise	B. What motivates women to exercise
Subtheme 1	<p><b>Lack of time</b></p> <p>“I work full-time and I’ve got 4 children...so, er, you know, it’s difficult for me..”</p> <p>“I don’t cycle as much but that’s more to do with work and time, rather than not wanting to..”</p>	<p><b>Psychological benefits</b></p> <p>“I feel better like yourself, after, after being outdoors for a run or a walk..”</p> <p>“...you can get your head around things, when you’re away from the house, away from the kids, away from your other half.”</p>
Subtheme 2	<p><b>Lack of motivation</b></p> <p>“I find it quite difficult to motivate myself to do exercise”</p> <p>“I’ve got weights at home ... I haven’t used them particularly yet, it’s one of these things, I’m suffering with erm, lack of motivation”</p>	<p><b>Physical benefits</b></p> <p>“I do swimming and I find that that really helps my bones because I have arthritis as well.”</p> <p>“For me, it’s increasing my fitness you know”</p>
Subtheme 3	<p><b>Lack of support</b></p> <p>“I went to the doctor’s...there was no support, there was nothing and of course I didn’t have my mum to turn to and ask for advice.”</p> <p>“ ‘cos I always feel like I’m bottom of the pile..”</p>	<p><b>Advice &amp; support from others</b></p> <p>“I go out with my friend...we try and get to the gym one evening per week, and you know, that does motivate me to get out, ‘cos I’m meeting her.”</p> <p>“I think there’s a ground swell of, of women that want to support each other through this and, and maybe its our generation that want to talk about it and, and help each other.”</p>

Subtheme 4	<p><b>Physical conditions</b></p> <p>“It’s difficult isn’t it with arthritis, ‘cos every bone hurts”</p> <p>“..exercising for me, gentle exercising ‘cos I’ve had the Crohn’s for years now.”</p>	<p><b>Being organised</b></p> <p>“If I’m gonna exercise, the thing that’s worked for me is, I’ve gotta get out of bed and put my exercise gear on immediately, I’ve gotta be dressed in it to have any chance of getting out for a run or a walk.”</p> <p>“I like to be prepared, erm, I do have confidence issues, erm, so I like to psych myself up for that.”</p>
Subtheme 5	<p><b>Impacts of Lockdown</b></p> <p>“..it was decreased, ‘cos I wasn’t able to play tennis.”</p> <p>“I am really desperate to go swimming.”</p>	<p><b>Impacts of Lockdown</b></p> <p>“Since lockdown and quarantine, I have done more”</p> <p>“I’ve done yoga inside, a little bit of yoga whilst er, the lockdown has happened.”</p>
Subtheme 6		<p><b>Supportive workplace</b></p> <p>“..we’ve got a nurse... who organised these erm, menopause meetings and erm, they were very good as well...”</p> <p>“I do work from home, I work for a company but I’m home-based, so actually, I can be sat here a bit sweaty and smelly and in my jogging stuff..”</p>

*Subthemes extracted from discussions from main Themes A & B*