

Health that shapes health: the menopause and changes in health behaviours

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Introduction

Health behaviour improvement is one of the most important individual instruments that can shape our own health. However, the relationship between health behaviour change and health condition is not unidirectional, i.e. also health conditions can affect health behaviours. This is a key message of the theory of “teachable moments”, which emerged from the field of health care research and practice, in the context of approaches encouraging healthy behaviours and discouraging unhealthy attitudes (Lawson and Flocke, 2009). As stated in McBride, Emmons and Lipkus (2003: 15), teachable moments are defined as “naturally occurring life transitions or health events thought to motivate individuals to spontaneously adopt risk-reducing health behaviours”.

In this paper, the focus is on women and on the physiological stage of menopause as a potential teachable moment that may induce changes in health-related behaviours. Since life transitions are often associated with changes in behaviours (Lang *et al.*, 2007), the rationale followed in the present study is that menopause, i.e. nor a positive nor a negative health event, but just a natural one, by impacting women’s life, may shape their attitudes and life style.

Background and aim of the study

Health behaviours are identified in those individual actions that can positively (such as exercise or eating well) or negatively (such as smoking or substance abuse) affect health, disability and mortality (Umberson, Crosnoe & Reczek, 2010). Since health-related behaviours shape health, their change over the life course acquires particular importance in the discourse of health outcomes in old age. However, the issue of positive changes in health behaviours can be addressed by the opposite perspective, i.e. by considering such changes not just as contributing to health improvement, but to some extent encouraged by health deterioration. The theory of the teachable moments seeks to promote the idea that some events over people’s life can be recognised as opportunities to engage in positive changes in health behaviours. The literature provides many examples of teachable moments. One of the most popular is cancer screening (Demark-Wahnefried *et al.*, 2005; Ganz, 2005; McBride and Ostroff, 2003; McBride *et al.*, 2008; Taylor *et al.*, 2007). Also surgery (Shi and Warner, 2010) and pregnancy (Phelan, 2010) have been proposed as opportunities to behave healthier.

In this context, menopause represents an interesting research track. This sensitive phase of women’s life is important not only in terms of reproductive health but also in terms of psychological wellbeing. Indeed, in such a process, biological, psychological and social alterations interact, thus leading women to experience the end of the menstrual cycle as a step of deep change in their life (O’Neill and Eden, 2017).

Menopause naturally occurs in adulthood. In general, age at natural menopause varies between 40 to 60 years (De Bruin *et al.*, 2001), and mean age at menopause is 51 (Shuster *et al.*, 2010). In the UK, the average age at menopause is 51 as well (O’Neill and Eden, 2017). However, different factors seem to influence the onset of menopause:

- biological and socio-demographic characteristics: age at menarche, low education, negative health perception, length of the period (Kaczmarek, 2007), marital status, working status, heart disease history, parity, prior use of oral contraceptives (Gold *et al.*, 2001);
- health behaviours: smoking (Hayatbakhsh *et al.*, 2012), alcohol consumption (Kinney, Klyne and Levin, 2006; Togerson *et al.*, 1997), physical activity engagement (Gold *et al.*, 2013).

The menopausal phenomenon fully considered, i.e. by taking into account both the transition and the postmenopausal period, is a delicate phase for women in terms of both general and psychological health. Overall, Van Dijk *et al.* (2015) identify eleven health conditions suffered by women during and after menopause (many of which are related to menopause itself), among which there are cardiovascular disease, metabolic syndrome, depression, sleep disturbance and migraine. This raises the question whether there are factors that can be modified in order to attenuate the health issues accompanying menopause. For instance, Dennerstein (1996) underscores the link between menopausal symptoms and other factors, such as socio-demographic characteristics, stress and health behaviours. In particular, physical activity has been found to reduce menopausal symptoms (Stojanovska *et al.*, 2014).

In summary, what the literature suggests is that the menopause process is associated with health behaviours. Following from this, the paper goes beyond the existing literature by investigating menopause as an opportunity to change health behaviours. In particular, it aims at studying the potential association between menopause and change in health behaviours, and at examining age at menopause in order to verify whether to experiencing menopause at one age or earlier/later is linked to the risk of behaving healthier. Although menopause is not a negative health event, but a natural progression in a woman’s life, it may be considered that

improvements in health related-behaviours may be more likely in this period, given the potential benefits in terms of symptoms reduction.

By focusing on alcohol consumption and physical activity, the following research questions are addressed:

1. Is menopause associated with changes in the frequency of alcohol intake and physical activity?
2. Is there any relation between age at menopause and changes in these health behaviours?

Data and methods

Data are drawn from the English Longitudinal Study of Ageing (ELSA), which provides information on several life domains, such as employment, health, and family of individuals aged 50 and over. In particular, two behaviours are considered:

- frequency of alcohol use during the 12 months preceding the interview: three broad frequency levels have been constructed for the analysis (low, medium and high) by combining the response options provided by the questionnaire;
- frequency of involvement in three kinds of physical activities: vigorous (such as running or jogging), moderate (like gardening), and mild (e.g. laundry).

By considering the changes between baseline and follow-up, three categories of changes in the frequency levels of behaviours are created, i.e. “no change”, “increase”, and “decrease”.

The paper carries out two kinds of analyses. Firstly, it takes into account two pairs of consecutive waves, i.e. Wave 1-Wave 2 and Wave 3-Wave 4, and investigates changes in frequency levels of alcohol use and physical activity by comparing women who experience menopause between baseline (firstly Wave 1 and secondly Wave 3) and follow-up (firstly Wave 2 and secondly Wave 4) to those reporting to have their period at both baseline and follow-up. Women of the sample are divided into two groups, i.e. those who experience the transition into menopause over two consecutive waves (treated) and those who do not (control group). However, some characteristics of these two categories may be associated not only with the probability of changing health behaviours, but also with the same probability of experiencing menopause, thus producing a selection bias on regression results. In order to reduce confounding, a propensity score weighted analysis is conducted. Therefore, propensity score, ATT (average treatment effect for the treated) and ATC (average treatment effect for the controls) weights are calculated and used into the final multinomial logistic regression models studying the changes in behaviours.

Secondly, all waves of ELSA are used and only women who experience menopause over the observation period and are interviewed at consecutive waves, i.e. at the wave when reporting to have had the last period and at the consecutive one, are selected. This analysis aims at investigating whether the age when women undergo menopause plays a role in health behaviours change. Multinomial logistic models are carried out to carry on the analysis.

Preliminary results

Table 1 shows results of the first type of analyses with regards to menopause only (in both tables, results on the other covariates are omitted) As for waves 1-2, the unweighted and the ATC multinomial regression models find no association between change in alcohol use frequency and menopause, while the ATT weighted model shows a relationship between being in menopause and modifying drinking habits with $p < 0.1$. Instead, results from the ATT weighted model studying vigorous activity change reports that the odds of decreasing than not changing frequency level of vigorous activity engagement are larger for women in menopause compared with those still menstruating at follow-up, with $p < 0.05$. Such a result is replicated by the ATC weighted model with $p < 0.1$. This suggests that selection may play a role in shaping results. Considering that the ATT weights estimate the average effect of the treatment, i.e. menopause, on current health behaviours among women having a high propensity for menopause according to the baseline characteristics, this result may suggest that if a woman who had had menopause had not had it at that time, would her current health behaviours be any different.

Moreover, results show that women experiencing menopause between Wave 1 and Wave 2 have larger odds of decreasing frequency level of moderate activity than not changing compared with women who still have a period at Wave 2. This is reported by all three models, i.e. unweighted, ATT and ATC weighted. No association, instead, is found between mild activity change and menopause state.

With regard to the analysis on waves 3-4, no relationship between menopause and changes in behaviours is found. After controlling for selection, instead, an association between mild activity and menopause state is reported: the ATC weighted model shows that women experiencing menopause between Wave 3 and Wave 4 have higher odds of decreasing frequency level of mild activity than not changing compared with women still menstruating at follow-up. To be clear, the ATC weights show the effect that menopause would have among women having a low propensity to experience it.

As a second step, all ELSA waves are used, and only women who experienced menopause over data collection and were interviewed both when having their last period and at the following are selected. Therefore, age at menopause is estimated and investigated as associated with changes in behaviours occurred between baseline and follow-up. Results from multinomial logistic regression (Table 2) do not report any relationship between age at menopause and changes in the frequency level of alcohol intake, vigorous and moderate physical activity engagement. Instead, an association between age at menopause and decreasing mild physical activity is found: a one-year increase in the age at menopause reduces the risk of decreasing relative to not changing frequency level of mild activity.

Table 1 - Relative Risk ratios of changing behaviours between baseline and follow-up: Multinomial Logistic Regression with and without ATT and ATC weights (ref. No change)

		Unweighted		ATT weighted		ATC weighted	
		Decrease	Increase	Decrease	Increase	Decrease	Increase
		RRR	RRR	RRR	RRR	RRR	RRR
Frequency of alcohol use							
Menopause state							
Still period (ref.)							
Waves 1-2 (N=337)	Menopause	1.88	0.95	2.11*	1.07	1.89	0.70
Waves 3-4 (N=336)	Menopause	0.89	0.63	0.98	0.58	1.14	0.68
Frequency of vigorous activity engagement							
Menopause state							
Still period (ref.)							
Waves 1-2 (N=373)	Menopause	1.65	1.42	1.95**	1.20	1.91*	1.73
Waves 3-4 (N=443)	Menopause	0.89	1.27	0.94	1.42	0.91	1.34
Frequency of moderate activity engagement							
Menopause state							
Still period (ref.)							
Waves 1-2 (N=372)	Menopause	2.58***	1.17	3.28****	1.15	2.39**	1.16
Waves 3-4 (N=443)	Menopause	1.23	1.51	1.28	1.53	1.19	1.58
Frequency of mild activity engagement							
Menopause state							
Still period (ref.)							
Waves 1-2 (N=373)	Menopause	1.92	0.68	1.87	0.45	2.14	1.00
Waves 3-4 (N=443)	Menopause	2.00	1.35	1.76	1.12	2.48**	0.87

*p<0.1; **p<0.05; ***p<0.01; ****p<0.001

Table 2 - Relative Risk Ratios of changing behaviours frequency: Multinomial Logistic Regression (ref. no change)

	Decrease RRR	Increase RRR
Frequency of alcohol use (N=412)		
Age at menopause	0.96	1.10
Frequency of vigorous activity engagement (N=501)		
Age at menopause	1.01	1.02
Frequency of moderate activity engagement (N=501)		
Age at menopause	1.02	1.01
Frequency of mild activity engagement (N=501)		
Age at menopause	0.86**	1.04

*p<0.1; **p<0.05; ***p<0.01; ****p<0.001

Preliminary conclusions and next steps

Overall, results report an association between menopause and physical activity, but some limitations of the study suggest taking these conclusions carefulness.

As for the first analysis, because of data availability, the logistic model run to calculate propensity score omits some relevant baseline characteristics presented in the literature as affecting the onset of and the age at menopause. Also, the sample size for both pairs of waves is quite small and the high number of missing values for alcohol measures – especially for waves 3-4 – implies a further reduction in the analytic sample of the model on change on alcohol use frequency level. Finally, in both pairs of waves, the highest percentage of women interviewed has not either increased or decreased the frequency level of alcohol intake and physical activity engagement. In particular, less than 20% of women in both sample changed their involvement in mild energetic activities, regardless their menopause state.

With regard to the second analysis, results may suggest that age at menopause matters for mild activity only and, in particular, that women experiencing menopause at older ages tend to have a lower risk of decreasing the frequency level of mild activity engagement. However, these results need to be taken with caution as well in the light of some limitations of the analysis. Firstly, as observed when conducting propensity score weighted regression, the highest percentage of women into the sample did not change their health habits between baseline and follow-up. Secondly, the variable measuring alcohol consumption frequency presents many missing values and this reduces the analytic sample size and may underestimate the real changes occurred in drinking habits.

Nevertheless, to have found no link between menopause and change in alcohol frequency level does not mean that an association with an increase/decrease in the alcohol units taken by respondents does not exist. Further analysis is needed to conclude that menopause cannot be included into the category of “teachable moments”. In particular, the next goal will be focusing on alcohol use through two steps:

1. to construct narrowest categories of alcohol frequency, which take into account all the response options of the questionnaire and not only the three broad levels (low, medium, high) used so far;

2. to consider the variable *alcohol consumption* combined with or instead of the variable *alcohol frequency*.

Identifying menopause as a teachable moment for changes in health behaviours would help promoting interventions for health behaviours change targeted for women experiencing this natural life transition also on the basis of the age when menopause occurs.

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