Self-rated menopausal status and quality of life in women aged 40-63 years

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Objectives. To determine whether quality of life (QOL) changes during the menopause as a function of menopausal status and other medical and lifestyle variables.

Design. A postal questionnaire sent to three different samples of women.

Method. A total of 1188 questionnaires were received from (a) two samples recruited from two Family Health Service Association (FHSA) lists and (b) one sample recruited through an advertisement in a women's magazine. The questionnaires consisted of (a) a seven domain, 48-item, condition-specific QOL questionnaire which was developed for this study (MQOL), (b) a single item global QOL questionnaire (GQOL), (c) questions about medical history, (d) questions about work status, (e) questions assessing menopausal status using two different techniques.

Results. Both the MQOL and GQOL indicated a relationship with menopausal status. GQOL and MQOL showed a U-shaped relationship with menopausal status, with lowest scores associated with the middle of the menopause. However, domain scores of Sleep and Energy failed to reach the levels reported by women who perceive themselves to be pre-menopausal, and domain scores of Symptom Impact and Social Interaction indicate steady decline during the menopausal transition. Women who experienced the menopause long ago reported the highest GQOL, feelings and cognition domain scores. Medical history and work outside the home play an important role in determining MQOL—women who had undergone hysterectomy, those who had tried but discontinued HRT while still in the middle of the climacteric, and those with greater co-morbidity had poorer QOL. Those who worked outside the home reported better MQOL, and those recruited through the magazine reported poorer QOL.

Conclusions. QOL is affected by the menopause, but the way it is affected depends on the measure of QOL used. QOL during the menopause is also affected by medical and lifestyle variables. QOL during the menopause is a complex interaction of several different kinds of variable.

The 'menopause' has multiple meanings depending on the context in which the term is used. First, in a medical context, the term is used to refer to the cessation of a women's menstrual cycle and is associated with a reduction in oestrogen levels. Typically a diagnosis of having reached the menopause is applied retrospectively. Second, in popular

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literature, e.g., women's magazines, the term menopause is associated with the whole of the climacteric, from when a woman begins to notice changes in her menstrual cycle or experiences symptoms that *she* associates with the menopause. A third use of the term menopause is found in the social science and feminist literature, (e.g., Hunt, 1994). Here the menopause is defined in much broader terms as a natural transitional phase in women's lives that recognizes the biological changes but also gives prominence to the social and cultural embodiment of women's lives as they experience the climacteric.

Irrespective of the perspective (which is seldom defined), symptoms reported to occur during the menopause include hot flushes and night sweats, vaginal dryness, sleep disturbance, anxiety, depression, irritability, fatigue, painful joints, headache, memory and concentration deficits, and sexual problems (Derman, Dawood, & Stone, 1995; Greene & Cooke, 1980; Hunter, 1992; Pearce, Hawton, & Blake, 1995; Wiklund *et al.*, 1992). However, declining oestrogen levels are unlikely to play a role in the aetiology of all these symptoms. Depression and poor psychological well-being are often reported during the climacteric, (Studd, Watson, & Montgomery, 1990) but these symptoms are more commonly associated with socio-demographic and psychosocial factors, previous experience of depression and lifestyle changes which coincide with the menopause (Bebbington, 1998; Dennerstein, Smith, & Morse, 1994; Green, 1992; McKinlay, McKinlay, & Brambilla, 1987). A reporting bias may explain the observed correlation between mental health scores and the reporting of menopausal symptoms (O'Connor *et al.*, 1995) as negative affectivity leads to greater awareness and reporting of physical symptomatology (Abraham, Llewellyn-Jones, & Perz, 1995; Watson & Pennebaker, 1989).

The relationship between quality of life (QOL) and menopausal status is controversial. Studies using the Nottingham Health Profile (NHP) have shown a positive relationship between menopausal status and QOL when comparing pre-menopausal to peri-menopausal and menopausal women in the 45-55 year age range (Ledesert, Ringa, & Breart, 1995; Oldenhave, Jaszmeann, Haspels, & Everaerd, 1993). Women experiencing severe climacteric symptoms reported lower QOL when compared with those experiencing only mild symptoms as measured by a time trade-off and symptoms impact rating scale (Daly et al., 1993). QOL differences were also reported among peri-menopausal women by Hunter (1992) using the Women's Health Questionnaire. However, Dennerstein (1996) claims that well-being, a term often used to define QOL measures (Ormel, Lindenberg, Stevennk, & Vonkorff, 1997), is not associated with menopausal status but is associated with psychosocial, lifestyle and current health status. Doyal (1994) suggests that women who work have greater self-esteem, social contacts and support networks which may account for differences in QOL between women who work and those who do not. Four factors may be contributing to this diversity of findings. First, there is a lack of common understanding of QOL (Hunt, 1997). Second, a variety of instruments are used including simple checklists of symptoms, measures of distress, measures of well-being, measures of physical and psychological health, and measures of satisfaction. Few attempts have been made to develop QOL instruments for research into women's health that are condition-specific and based upon women's experiences. Third, different samples included women attending menopausal clinics, attending routine ovarian screening, opportunist samples, and studies using small population samples. Fourth, there are different ways of determining menopausal status.

Hormonal intervention studies claim to show that hormone replacement therapy (HRT) can improve QOL in menopausal women. In one study women taking HRT for 4

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months reported significant improvements in (a) sleep, emotions and energy subsections of the NHP, (b) well-being, anxiety, vitality, self-control, depression and health subscales of the Psychological General Well-Being Index, and (c) tension and satisfaction with life subscales of the Feelings Adjective Checklist (Wiklund *et al.*, 1992). In another study, women reporting menopausal symptoms showed an overall improvement in QOL following 4 months' treatment with HRT using the Kuppermen Menopausal Index (which measures severity of symptoms) and the Green index (which measures feelings and symptoms) (Derman *et al.*, 1995).

Despite these reported advantages of HRT, the use of HRT remains low with estimates of between 7% and 22% of peri-menopausal and menopausal women receiving HRT in the UK at any one time (Oddens, Baulet, Lehert, & Visser 1994). McCleery and Gebbie (1994) cite a 1992 National Office of Populations survey of 1000 women in which 25% of women who started HRT discontinued it within 6 months. Few have compared QOL in former users with either current or never used, nor with pre- or post-menopausal women who may be using HRT prophylactically.

This paper provides comparative data for QOL of women in the age range 40–63 years. The majority of previous studies fail to include women over the age of 55 years, so that little information exists about the end of the climacteric at a time when women may be still coming to terms with physical, social, cultural and psychological changes associated with the menopause and ageing. In this study we have chosen to define QOL as 'the extent to which the physical, emotional and social aspects of a person's life are intact' (Fletcher & Bulpitt, 1987). The advantage of using this definition is that the biological, social or psychological variables that may be responsible for the adverse impact upon women's lives become a secondary consideration, and the focus is placed squarely upon a woman's experiences, her interpretation of the menopause and the impact she believes it has on her QOL. In order to effect these comparisons, we developed a menopause-specific QOL scale. Condition- or disease-specific QOL measures provide a more inclusive characterization of the QOL of a condition or disease (Hyland, 1992), and therefore can be more sensitive to cross-sectional and longitudinal differences.

Methodological issues

Levels of circulating oestrogens do not correlate reliably with reported symptoms so that studies need to find alternative criteria for determining menopausal status. Inferring menopausal status from menstrual cycle information can be unreliable because the menstrual cycle is affected by the use of HRT and by surgical interventions. Menstrual cycle classification on its own also clumps together women who, because of age differences alone, may experience differing QOL. An alternative strategy is to ask women to self-rate their menopausal status directly (e.g., whether they are pre-menopausal, have just reached the menopause, are in the middle of the menopause, at the end of the menopause, or are past the menopause long ago, Groeneveld *et al.*, 1993).

Issues of health unrelated to menopausal status may be an important consideration in a QOL study whose population covers a 23-year age span. As people get older chronic health conditions and co-morbidity increase and levels of medication usage rise (Lewis, Rook, & Schwarzer, 1994). Accordingly, we asked respondents to list medication usage in the last 2 months in order to evaluate co-morbidity.

Aims of study

- (1) To develop a condition-specific questionnaire that examines menopausal QOL in women.
- (2) To examine the impact of employment, age and medical history on menopausal QOL.
- (3) To provide cross-sectional information on differences in QOL in a community based sample of women as a consequence of self-rated changes in menopausal status.
- (4) To examine the relationship between the use of HRT and QOL in the middle of the menopause.

STUDY 1 DEVELOPMENT OF QUESTIONNAIRE

Interviews and focus groups

Thirty-two women were recruited from an advertisement within the university and an advertisement in a local newspaper. The group was heterogeneous and included unemployed, housewives, cleaners, clerical staff and a university lecturer. The average length of interview was 25 minutes and all but one were audio-recorded with permission. An additional 29 women attended one of four focus groups. The focus groups lasted for around 1 hour 15 minutes and were audio-taped with permission. The mean age of the total sample (N = 61) was 48 years 9 months (SD = 4 years 7 months, range 40–60 years). Of the total sample, 43% currently used HRT, 13% were former users and 44% had never used HRT, and 21% had undergone a hysterectomy.

Questionnaire design

The content of interviews and focus groups were analysed using an adaptation of a contact summary (Miles & Huberman, 1994). Salient themes, concepts and issues were identified using a coding system and summary transcripts of each interview and focus group were prepared. This system of analysis allows the frequency of themes to be determined and highlights exemplar statements from participants that represent each theme, concept and issue. From this analysis, 63 items arranged in seven domains were constructed for use in the pilot questionnaire, with a 1–6 response format ranging between 'I am never like this' and 'I am always like this.' Thirty-four items were negative (i.e., stating some disadvantage) and 29 were positive to minimize effects of response bias. QOL domains and number of items per domain were as follows: Energy (14 items), Sleep (5 items), Appetite (4 items), Cognition (8 items), Feelings (13 items), Interactions (10 items), Symptoms impact (14 items). The number of items chosen for each domain represented the frequency with which themes occurred during the interviews and focus groups. Personal details were added to the questionnaire including self-rated menopausal status, menstrual cycle status, (Groeneveld *et al.*, 1993) employment status, hysterectomy and ovary removal, current medication, and history of HRT use.

Pilot questionnaire

A total of 191 questionnaires were distributed via pharmacies, the public library, a local health food outlet, personal contacts and previous participants in focus groups and interviews. Of these, 99 were returned (response rate 52%) and analysed. The mean age of the sample was 50 years 10 months (SD = 5 years 2 months). Thirty per cent of women were current users of HRT, 8% were former users and 17% had never used HRT.

Analysis for item selection

The psychometric properties of items were examined in terms of item response frequency, item-total correlations and item intercorrelations. Fifteen items were deleted either because of negative skew (more than 75% responding to any one response category) low item-total correlations or very high intercorrelations with other items leaving a 48-item questionnaire with seven domains which was used for the main study. All

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but one of the items associated with the food and drink domain were removed by this procedure. Although food and drink problems were indicated by the focus groups and interviews, the pilot questionnaire indicated that this was an infrequent problem.

STUDY 2 MAIN STUDY

Participant recruitment

There were three sources of recruitment for the main study. Two of these were random samples of women aged between 40 and 63 years from patient lists of two adjacent Health Authorities in the South West of England (Health Authority 1 and Health Authority 2). A total of 750 questionnaires were distributed to women in Health Authority 1 and 1000 to Health Authority 2. The third source (magazine) was a very short editorial piece in a national women's magazine inviting readers to write to the University if they were interested in taking part in a survey on the menopause. Those requesting participation in the study and those from the Health Authority lists were sent anonymous postal questionnaires with freepost envelopes for return.

Measures

The following assessments were taken: the 48-item menopause-specifc QOL questionnaire (MQOL; developed in Study 1), and a global measures of GQOL (H-scale) in which participants were asked to rate their overall QOL on a 100-point scale (Hyland & Sodergren, 1996). The global H scale has named end points ('perfect quality of life' and 'might as well be dead') as well as seven additional quantifiers along the scale, these additional quantifiers having been found to be associated with greater reliability and responder preference compared with simple endpoint labelling. Questions on menstrual cycle status, the self-rated menopausal status classification (Groeneveld *et al.* 1993), current and former HRT use and biographical/medical characteristics were also included. An estimate of co-morbidity was determined by classifying medication used in the past 2 months according to British National Formulary (BNF) categorization, i.e. central nervous system, gastro-intestinal, cardiovascular, respiratory, malignant disease etc. then counting the number of BNF areas that a respondents medication fell under, i.e., one point for each area.

Results

Sample characteristics

A total of 413 responses were received from Health Authority 1 (response rate 55%) and 403 were received from Health Authority 2 (response rate 40.4%). A cut-off date of 2 months was applied to acceptance of data into the final analysis. Following recruitment via the magazine, 372 questionnaires were received. The total sample consisted of 1188 responses, mean age = 51 years 2 months, SD = 6 years 1 month. The relationship between self-rated menopausal status, age range and HRT use are shown in Table 1. The level of current use of HRT is 22.5% of total sample, similar to rates of HRT usage found in other questionnaire studies, e.g., Quine & Rubin (1997). Of the women who were using or had used HRT (N = 463) 162 (35%) had used more than one brand. Ninety-two women (8%) aged 54 years or more described themselves as 'just having reached the menopause' or 'in the middle of the menopause' which is consistent with general population findings that approximately 90% of women will have experienced the menopause between the ages of 45 and 54 years (Treloar, 1974). Of the total sample, 207 (17%) women had undergone hysterectomy, a quarter of whom (N = 52) had had both ovaries removed. General population rates in the UK for

hysterectomy are usually given at around one in five of all women who reach the age of 60 years (Dickinson & Henriques, 1994) although regional variations exist. Three hundred and ninety-five women (33%) who responded to the survey reported taking prescribed drugs other than HRT in the last 2 months, and a further 60 women (5%) reported taking non-prescribed medication such as vitamin supplements and primrose oils. Of the total sample, 713 women (60%) were employed or doing unpaid voluntary work outside the home.

		Age rang	e (years)			HRT use	
Self-rated menopausal status $(N = 1188)$	40-46	47-53	54-60	60+	Never used	Former user	Current user
Not reached menopause	193	71	0	0	254	13	7
Just reached menopause	81	120	9	0	144	24	48
In middle of menopause	46	167	75	8	101	75	144
Reached end of menopause	2	34	61	30	66	40	29
Reached menopause long ago	3	28	58	78	93	42	39
Totals	325 (27%)	420 (35%)	213 (18%)	116 (10%)	654 (55%)	196 (16.5%)	267 (22.5%)

Table 1. Self-rated menopausal status and age, and HRT status

Sample differences

A one-way between-group ANOVA (F = 9.36, p < .001), indicates a significant difference in the age of women by source of recruitment. Scheffe's follow-up indicates that women who responded to the Magazine advert were younger than respondents from both of the Health Authority lists. Inspection of frequencies by source of recruitment indicates that the magazine sample as compared with the two health authority samples was more likely to be on HRT, more likely to have undergone hysterectomy, and were at an earlier stage of the menopause.

Inspection of mean scores on the MQOL and GQOL scales revealed that women recruited through the Magazine advertisement were reporting lower levels of QOL than the Health Authority groups on all of the menopause-related domains, total MQOL and GQOL. No significant differences were found between the two health authority groups.

Factor analysis

A principal components analysis was conducted on the full data and separately for each of the subsamples. For all these analyses there was a strong one-factor solution which for the full data set accounted for 35% of the data variance with an eigen value of 16.01. This one-factor solution appears to be a general severity factor. Because QOL items can form highly intercorrelated hierarchical structures (Hyland, Bellesis, Thompson, & Kenyon, 1997) we also conducted exploratory factor analyses using oblimin rotation, for the total sample and for each of the subsamples. In the case of the full data set a meaningful seven-factor, hierarchical structure was obtained which accounted for 57% of the data variance

with eigen values of 16.01, 3.04, 2.21, 1.72, 1.65, 1.51, 1.39, but this structure was not stable across subsamples. There was a close but not identical relationship for the full data set between the factor structure and the domain structure. As we wished to combine the three subsamples for analyses, we adopted the simpler solution (which was common to all subsamples) of a single general factor of menopausal QOL. Therefore we aggregated overall (equally weighted) items to produce a total menopausal QOL score (the MQOL). In addition we calculated domain subscores based on our original classification of items to domains. Factor loadings and their association between items and domains for the first factor are shown in Appendix 1.

As a measure of internal consistency of the scale, Cronbach's alpha for the total MQOL score and for each of the domains was calculated. Results are shown in Table 2.

				Symptoms		Social		
	Sleep	Energy	Cognition	impact	Feelings	interaction	Appetite	MQOL
Energy	.33*							
Cognition	.35*	.44*						
Symptoms impact	.36*	.68**	.32*					
Feelings	.41*	.54*	.65**	.44*				
Social interaction	.24*	.68**	.37*	.67**	.56*			
Appetite	.25*	.29*	.27*	.26*	.35*	.26*		
MQOL	.51*	.83**	.67**	.78**	.84**	.82**	.40*	
GQOL	.33*	.42*	.43*	.40*	.63**	.43*	.29*	.61**
Cronbach's alpha	.75	.69	.76	.75	.91	.90	_	.92

Table 2. Correlation matrix and Cronbach's alpha: Domains: Sleep, Energy, Cognition, Symptoms Impact, Feelings, Social Interaction, Appetite, Total Menopausal Quality of Life (MQOL) and Global Quality of Life (GQOL) (N = 1188)

* = p < .05; ** = p < .001.

Relationship between menopausal QOL domains and total scores and global QOL scores

The menopausal questionnaire items can be aggregated to produce a measure of overall QOL deficit (MQOL), but in addition, respondents rated their global QOL using a global H-scale (GQOL). Table 2 also shows the correlations between domain subscale, the total menopausal score and the global score. The total MQOL and GQOL scores have slightly less than 40% variance in common, indicating that these are highly related, but nevertheless distinct. All domains were statistically related with GQOL. Intercorrelations between the domains scores range from .25 to .68. The highest reported correlations between the domains scores were: energy and social interaction (.68); energy and symptoms impact (.68); symptoms impact and social interaction (.67); and cognition and feelings (.65). As a further exploration of the determinants of global QOL we carried out a multiple regression with GQOL as the dependent variable and all seven domain scores, age, self-rated menopausal status and HRT use as independent variables (Table 3).

Scores on the feelings domain were the best predictors of global QOL, but impact of symptoms, appetite, sleep and age also contributed independently to global QOL, with all of these variables accounting for some 43% of the variance in global QOL score.

Predictor	Multiple R	R^2	F	Partial correlations	Beta
	.653	.427	87.73**		
Age				.069	.055*
Self rated menopausal status				.012	.011
HRT usage				.015	.011
Sleep				.060	.052*
Energy				.015	.018
Cognition				.017	.018
Symptoms impact				.109	.130**
Feelings				.379	.495**
Social interaction				.014	.017
Appetite				.069	.057*

Table 3. Multiple regression analysis: GQOL

*p < .05; **p < .0001

Measuring menopausal status

Table 4 shows the relationship between self-rated menopausal status and menstrual cycle status by age range. Respondents who are currently taking HRT or who have undergone hysterectomy have been excluded due to the effect of these factors on the menstrual cycle. Cross-tabulations show that for the age range 40–53 years, 70% of the women who report having regular menstrual periods in the last 12 months describe themselves as not having reached the menopause. Of the women who report having no menstrual periods in the last 12 months, irrespective of age, 97% describe themselves as being in the middle or at the end of the menopause. Most variability in self-rated menopausal status is associated with women who have experienced changes in their menstrual periods during the last 12 months.

Medical history, work status and menopausal QOL

In order to examine the impact of employment and health status on menopausal QOL we calculated a multiple regression analysis. Employment status, co-morbidity, HRT use, hysterectomy, ovary removal, self-rated menopausal status age and source of recruitment were used as independent variables. Overall, 39% of the variance was accounted for by these variables.

Partial correlations (Table 5) indicate that the best unique predictor of MQOL was employment status, with women working outside the home reporting significantly higher levels of MQOL than those not working outside the home. Significant unique contributions to MQOL were also found for: source of recruitment, age, co-morbidity, self-rated menopausal status and HRT use (in order of importance).

Sensitivity of questionnaire scores to self-rated menopausal status

If the severity of menopausal symptoms affects QOL as reported previously (Daly *et al.*, 1993), then responses to the questionnaires should covary with menopausal status. In order to determine relationships between stages of the menopause and QOL,

		Regular	menstru	al perio	spa	0	hanged	menstru	al period	ds		No me	enstrual	periods	
N = 872		in la	st 12 mc	nths			in las	st 12 mo	onths			in la	st 12 mo	onths	
Age range															
(years)	40-46	47-53	54-60	+09	%	40 - 46	47-53	54-60	+09	%	40 - 46	47–53	54-60	+09	%
SRM1	122	37	0	0	20%	63	28	0	0	27%	0	0	0	0	0
SRM2	15	11	1	0	12%	52	76	2	0	40%	1	2	2	0	3%
SRM3	7	21	2	2	15%	25	69	10	2	31%	9	41	40	С	30%
SRM4	0	7	1	1	2%	0	4	2	0	2%	1	22	47	18	29%
SRM5	0	1	0	1	< 1%	1	2	1	0	1%	2	13	47	52	39%
%	63%	32%	3%	2%	N = 227	41%	53%	5%	< 1%	N = 340	3%	27%	47%	26%	N = 305
<i>Note</i> . Missing menopause; S	data = 86. RM5 = rea	SRM1 = 1 ched ment	not yet reac ppause long	ched the g ago. Ex	menopause; SI scluded curren	RM2 = just t users of H	t reached t	he menop: /sterectom	tuse; SRM y.	3 = in the n	niddle of m	ienopause; 5	SRM4 = r	eached e	nd of

Table 4. Cross-tabs: Menstrual cycle by age range by self-rated menopausal status

Predictor	multiple R	R^2	F	Partial correlations	Beta
	.624	.396	70.31*		
Source of recruitment				.37	.32*
Age				.21	.28*
Hysterectomy				03	03
Oophrectomy				.04	.04
HRT use				14	13*
Co-morbidity				20	17*
Employment				.42	.41*
Self-rated menopausal status				16	21*

Table 5. Multiple regression analysis: MQOL

*p < .00001.

between-group analyses of covariance were calculated to examine effects of self-rated menopausal status by GQOL, MQOL and each of the seven domain subscale scores, with source of recruitment, age, hysterectomy, ovary removal, HRT use, co-morbidity and employment status as covariates. Results indicate that when health differences and employment status are accounted for, menopausal status interacts with: GQOL (F(4, 1009) = 8.05, p = .00002), MOOL (F(4, 810) = 7.09, p = 0.00011), symptom impact (F(4, 876) = 11.10, p = .000001), sleep (F(4, 986) = 8.32, p = .000001), energy (F(4, 966) = 3.80, p = .004), cognition (F(4, 1010) = 4.16, p = .002), feelings (F(4, 986) = 6.38, p = .00004), social interactions (F(4, 1019) = 7.44, p = .000007), appetite (F(4, 1026) = 0.66, n.s.). Scheff's follow-up analysis indicates that significant differences in QOL scores occur between the middle two stages of stages of the menopause (just reached and in the middle of the menopause) and the pre- and post-menopausal stages (have not reached, have reached the end, and reached menopause long ago) on GQOL, MQOL and the subscales of sleep, cognition and feelings.

Table 6 shows the adjusted mean values for each of the self-rated menopausal status categories on the seven domain subscales as well as MQOL and GQOL. Domain scores show different patterns of relationship with menopausal status. Overall mean scores follow an inverted U-shaped pattern across the stages of the menopause with the lowest scores achieved in the middle of the menopause for each of the domains, MQOL and GQOL scores. Two patterns can also be distinguished: (a) decline and recovery above pre-menopausal level (GQOL, cognition and feelings); (b) some initial recovery but does not reach pre-menopausal levels (MQOL, sleep, social interaction, symptom impact and energy).

Relationship between QOL, co-morbidity and HRT use

HRT has been found to improve QOL for some women who undergo a natural menopause (Daly *et al.* 1993; Derman *et al.* 1995; Karlberg, Mattsson, & Wiklund, 1995) but it seems plausible that HRT use is more likely to be used by women who suffer QOL deficits during the menopause. Differences in QOL may also provide information on the efficacy of HRT use and provide insight into women who stop taking during the middle of the menopause. A between-group ANOVA of HRT use by MQOL, GQOL and co-morbidity

recruitment, employment stat	ns, 1111 u							- H	-
Self-rated menopausal status $(N = 1088)$	Sleep	Energy	Cognition	Symptom impact	Feelings	Social interaction	Appetite	Total MQOL	Global QOL
Not yet reached menopause	12.80	38.83	17.00	40.09	50.63	30.38	4.95	198.85	74.67
Just reached menopause	10.66	36.86	15.46	35.88	44.87	27.44	4.80	179.77	67.39
In the middle of menopause	9.99	34.23	14.82	32.05	43.49	25.20	4.70	168.21	63.18
Reached end of menopause	11.36	36.10	16.68	32.86	51.44	26.55	4.98	184.43	74.43
End of menopause long ago	11.50	33.04	17.66	29.41	53.49	24.12	4.89	178.11	74.71

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was calculated with scores of women in the middle of the menopause only. In order to identify the impact upon women undergoing a natural menopause, respondents who had undergone hysterectomy were excluded from the analysis. Results suggest a significant relationship between QOL and HRT use: MQOL by HRT use (F(2, 232) = 10.02, p = .0001), GQOL by HRT use (F(2, 198) = 4.54, p = .001), co-morbidity by HRT use (F(2, 217) = 5.97, p = .0001). Scheffe's follow-up analysis revealed that significant differences lay between former HRT users and both current users and those who had never used HRT on MQOL, GQOL and co-morbidity. Inspection of mean scores by HRT use indicates that former users of HRT score significantly lower on both QOL measures and have significantly higher co-morbidity scores when compared with current users and never-used HRT groups.

Discussion

Development of the MQOL scale

We developed a condition-specific QOL questionnaire (MQOL) for menopausal women on the basis of interviews and focus groups with 61 women. The final 48-item questionnaire (developed from an earlier 63-item version) covered seven domains; sleep, energy, cognition, symptom impact, feelings, social interactions and appetite. All items were highly intercorrelated, and psychometric analysis showed a large first factor accounting for 35% of the variance, upon which all items loaded. A large first factor is a common finding in QOL measures and is a general severity factor. We also conducted an exploratory factor analysis using the full data set, with an oblimin rotation. This produced a seven factor hierarchical structure which accounted for 57% of the data. The seven factors corresponded closely with the domain structure but the factor structure was not consistent across samples. Consequently, we scored the MQOL questionnaire (a) by an overall score and (b) subscale scores for each of the seven domains.

Menopausal quality of life both for total scale and for domains was highly correlated with global quality of life. While we would expect good correlations between a condition-specific and global measures of QOL, the size of the correlation (r = .61) supports the use of condition-specific QOL measures to provide information to that of self-rated global QOL. Cronbach's alpha ranged from .92 for the total MQOL scale, and from .91 to .69 for each of the menopausal QOL domains, suggesting that the scale has a reasonable level of internal consistency.

Measuring menopausal status

Determining menopausal status in surveys remains problematic. The term 'menopause' has many possible interpretations and we would expect some differences in interpretation among respondents. We found that the self-rated menopausal status classification has advantages over a broad menstrual cycle classification. Firstly, it allows for the classification of women who for medical reasons no longer have a menstrual cycle but who perceive themselves to be at a different stage of the menopause than their menstrual cycle status would suggest. Second, if the menopause is not just a biological event linked to the menstrual cycle, then other indicators, or a woman's own perceptions become important

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in determining their position in that process. Third, the menstrual cycle classification assumes that women who no longer have a menstrual cycle are similar and form a heterogeneous group. However, we found that QOL is different for women who perceive that they experienced the menopause long ago when compared with women who perceive that they have just reached the end of the menopause, irrespective of age. Thus self-rated menopausal status has discriminability beyond that of menstrual cycle status, as both women at the end of the menopause and those who reached it long ago are equivalent in terms of menstrual cycle status.

Sample effects and self-selection

We obtained data from three different samples. Although women recruited through two different Health Authorities had similar levels of QOL, those recruited through the Magazine sample had significantly poorer QOL. Nevertheless, all of our samples are biased by self-selection, and the perception that the study concerns the menopause may possibly have biased the samples towards greater severity of problems compared with the total population.

Medical history and work history and MQOL

Doyal's (1994) research highlighted the role of women's employment status in their physical and mental health. Our results suggest that working outside the home also makes a positive contribution to menopausal quality of life: women who work outside the home reported significantly higher MQOL.

In addition, current health and medical history also affect MQOL: women with high levels of co-morbidity and those who undergo hysterectomy or oophrectomy report lower MQOL compared with women with good health. Poorer QOL was also reported by those who were former users of HRT compared to those who were present users or had never used HRT. However, we also found that women who were former users of HRT reported significantly higher levels of co-morbidity. Thus, employment, gynaecological history and co-morbidity are all related to MQOL.

QOL changes over the menopause

Previous research has been equivocal about the relationships between menopausal status and QOL changes. Dennerstein (1996), reported that menopausal status did not affect well-being. However, Oldenhave *et al.* (1993) and Ledesert *et al.* (1995) show a positive relationship between menopausal status and QOL in pre-menopausal and perimenopausal women. We found that when lifestyle, health differences and HRT usage were accounted for, QOL was related to the menopause, but the relationship differed as a function of the measure used. In the global quality of life, cognition and the feelings domains, there was an inverted U-shaped relationship in which women at the end of the menopause were more positive than women who were at the beginning. Menopausal quality of life, and the domains of sleep and energy also show an inverted U-shaped relationship across the stages of the menopause, but these scores did not reach levels reported by women at the beginning of the menopause. However, scores for the domains of social interaction and symptom impact indicate a steady decline in QOL during the menopause. Overall the lowest QOL scores irrespective of measure were reported by women who self-rated themselves as being in the middle of the menopause.

Thus, our data support the apparently contradictory assertion of Dennerstein (1996) that lifestyle is important to QOL and Oldenhave *et al.* (1993) and Ledesert *et al.* (1995) that menopausal status is important to QOL. Our data also show that both are important. In addition, our data show several other factors that need to be taken into account when considering QOL during the menopause.

First, women who were not working outside the home also reported lower QOL when compared with women who worked outside the home. As women who declare themselves to be at the end of the menopause and beyond are mostly close to, or past retirement age, these data suggest that some of the decline in QOL at the end of the menopause may be reflecting other social changes in women's lives associated with ageing, rather than hormonal changes.

Second, our data show the effect of sampling method. We found that women who were invited to take part in an menopausal study through a magazine advert were much more likely to be suffering from QOL deficits, and had tried and given up on HRT despite these deficits. Other researchers have used a variety of sampling procedures. Dennerstein (1994) used a population sample recruited through random digital telephone dialling, Ledesert *et al.* (1995) used volunteers from the French national gas and electricity company, Hunter (1992) took a sample of women attending routine ovarian screening service at a London hospital.

Third, our data show the advantage of self-rated menopausal status compared with information about the menstrual cycle, used by some other researchers, e.g. Ledesert *et al.* (1995), Hunter (1992) and Dennerstein (1996). We found that self-rated menopausal status provided additional discriminability.

In conclusion, our results show a relationship between self-rated menopausal status and QOL, and between lifestyle and QOL. They also indicate the importance of medical history and the opportunity to work outside the home in determining QOL. For many women any decline in QOL during the menopause is followed by improvement in QOL, and the end of the climacteric coincides with high levels of QOL evaluations on some dimensions.

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Appendix

Menopausal Quality of Life Scale

Factor Loadings: Principal components analysis, unrotated (N = 1188)

Scale items	Domain	Loading
Things I used to enjoy have become a bit of a chore	Energy	.73
I have a general sense of well-being	Feelings	.72
I feel enthusiastic about things	Feelings	.71
I feel cheerful	Feelings	.71
I am depressed about things that didn't bother before	Feelings	.71
I find I have the energy to do the things I want	Energy	.70
Because of my symptoms, I miss out on leisure activities	Symptoms impact	.69
I am finding it increasingly difficult to do my work	Energy	.68
I feel confident	Feelings	.67
I'm afraid to tell anyone at work how I feel	Interactions	.66
I suffer from unpredictable mood swings	Feelings	.66
I can keep going all day without any difficulty	Energy	.66
I am too tired to do everyday tasks	Energy	.65
I am more reclusive than I would like	Interactions	.65
I worry that I might snap at friends or at people at work	Interactions	.64
I get very irritable with people at home	Interactions	.64
I worry about missing work because of my symptoms	Symptoms impact	.64
I feel stable	Feelings	.63
I get tearful easily	Feelings	.62
At times I want to lock myself away at work	Interactions	.62
I lose my temper over small things	Feelings	.61
I can concentrate easily	Cognition	.60
Because of my symptoms I sometimes have to get out of places	Symptoms impact	.59
I have a problem remembering everyday things	Cognition	.58
I think my memory is quite good	Cognition	.58
I feel isolated	Feelings	.58
I do less than I would like	Energy	.57
I start a conversation and can't remember what I was saying	Cognition	.56
I feel inadequate in comparison to other people of my age	Feelings	.56
I scream and shout at people at home	Interactions	.56
I enjoy chatting as much as I ever did	Interactions	.55

Scale items	Domain	Loading
I am too tired for sex	Energy	.53
I enjoy sex as much as ever	Symptoms impact	.52
I feel good about my appearance	Feelings	.51
I can concentrate on hobbies for as long as I used to	Cognition	.50
I find housework easy	Energy	.50
My flushes/night sweats keep me awake at night	Symptoms impact	.47
I find hot flushes embarrassing	Symptoms impact	.47
At night I throw off all the bedclothes and then feel cold	Symptoms impact	.46
I can work hard if I want to	Energy	.46
I usually sleep well	Sleep	.45
I sleep through the night	Sleep	.44
I find intercourse uncomfortable because of dryness	Symptoms impact	.41
I have a good appetite	Appetite	.40
I find I can't get back to sleep if I wake at night	Sleep	.37
My symptoms do not interfere with my work	Symptoms impact	.35
I am more interested in sex	Symptoms impact	.31
I take short naps during the day	Energy	.25