Pain coping, pain acceptance and analgesic use as predictors of health-related quality of life among women with primary dysmenorrhea

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Abstract

Objectives: Primary dysmenorrhea causes menstrual pain that affects women's quality of life (QoL) and analgesics are only moderately effective. Pain coping and pain acceptance influence QoL among people affected by other chronic pain conditions, so we examined pain coping, pain acceptance and analgesic use as predictors of QoL among women with primary dysmenorrhea.

Study Design: 145 women with primary dysmenorrhea completed an online survey including the Menstrual Symptoms Questionnaire (MSQ), the Coping Strategies Questionnaire (CSQ), the Chronic Pain Acceptance Questionnaire (CPAQ-8), questions about analgesic use, and the Short Form-12 (SF-12), a measure of physical and mental health-related QoL.

Results: In multiple regression, pain acceptance predicted better physical and mental QoL, whereas pain coping did not predict mental or physical quality of life. Being married or cohabiting and menstrual pain that was less severe and shorter in duration predicted better physical QoL, and those effects were mediated by pain acceptance. Being older at the onset of painful periods predicted better mental QoL and that effect was also mediated by pain acceptance. More severe menstrual pain and congestive rather than spasmodic dysmenorrhea predicted worse mental QoL but those effects were not mediated by other factors. Analgesic use did not predict physical or mental QoL.

Conclusions: The results show the impact that menstrual pain has on women's quality of life, and suggest that initiatives to increase pain acceptance among women with menstrual pain are worthwhile. More research is needed to understand more fully the factors that influence health-related quality of life among women with menstrual pain.

Keywords: menstrual pain, quality of life, acceptance, coping, analgesics.

INTRODUCTION

The most common gynaecological problem among menstruating young women is primary dysmenorrhea, defined as "cramping pain in the lower abdomen just before or during menstruation, in the absence of other diseases such as endometriosis".[1] Among 40 general population studies around the world, dysmenorrhea prevalence rates ranged from 17% to 81%,[2] and in 15 large community samples in 11 countries they ranged from 16% to 90%.[3] In developing countries, 75% of adolescents experienced menstrual pain, and 5% to 20% reported severe dysmenorrhea or pain that prevented them from participating in their usual activities.[4]

Dysmenorrhea is strongly associated with increased depression and anxiety[5] and reduced health-related quality of life.[6,7] The most common treatment in one large survey was analgesic medication,[8] but 33.5% of those who took medication for dysmenorrhea in another large survey reported little or no effects, and only 43% reported moderate effects.[9] There is therefore significant potential for alternative methods to improve the quality of life of women affected by dysmenorrhea.

Two contrasting approaches to helping people with chronic pain focus on coping and acceptance. Coping-based interventions are usually based on cognitive-behavioural therapy (CBT) and aim to change thoughts and beliefs about pain, to reduce negative thinking and increase positive, adaptive ways of responding to pain, in order to help people control, reduce or avoid pain.[10] This approach has been effective for chronic pain conditions generally.[11,12] A qualitative study showed that the pain coping strategies used by young women with dysmenorrhea included planning activities before the onset of pain, using social support, and developing a mind-set to tolerate pain.[13] A questionnaire study found that active behavioural coping strategies were used more than avoidant ones, and active strategies were associated with less stress, better health, more regular exercise, and an internal health locus of control.[14] However, there is no evidence to our knowledge about relationships between pain coping strategies and quality of life among women with dysmenorrhea.

Acceptance-based approaches for chronic pain were developed because when pain is chronic, attempts to control or avoid it using coping-based methods can be unsuccessful and lead to feelings of failure and defeat. For some people with chronic pain, it can be more helpful to recognise that pain cannot always be avoided or controlled and that it is still possible to have a meaningful life and continue with valued activities.[15] Pain acceptance was defined as "a willingness to experience pain without attempts to control it, and as persisting with healthy activities while pain is present, but doing so in a manner that is free from influences of the pain itself".[16]

Pain acceptance rather than pain coping is often a better predictor of outcomes including quality of life among people with chronic pain attending pain clinics[17] and among people with fibromyalgia,[18] chronic musculoskeletal pain[19] or chronic haemophilia-related joint pain.[20] However, there is no evidence to our knowledge about pain acceptance among women with dysmenorrhea. The present study therefore aimed to examine pain coping, pain acceptance and analgesic use as predictors of quality of life among women with primary dysmenorrhea.

METHODS

The study was an online questionnaire survey of 145 women with primary dysmenorrhea aged 18-50 years. The inclusion criteria were being female, over 18 years old, and experiencing pain during current menstruation. The exclusion criteria were having an underlying pelvic condition or pathology, or having reached menopause.

Menstrual symptoms were measured using the Menstrual Symptoms Questionnaire. This differentiates spasmodic dysmenorrhea, which causes painful spasms similar to labour pains beginning on the first day of menstruation, from congestive dysmenorrhea, which causes dull aching pain accompanied by lethargy and depression preceding onset of menstruation.[21] Pain coping was measured using the Coping Strategies Questionnaire, which gives scores for catastrophizing,

diversion, reinterpreting and cognitive coping.[22] Pain acceptance was measured using the Chronic Pain Acceptance Questionnaire-8.[23] Health-related quality of life was measured using the Short Form-12, which gives scores for a physical component summary (PCS) and a mental component summary (MCS).[24]

Participants were recruited by posting a brief invitation on relevant social media platforms and discussion forums, which directed potential participants to the study, hosted by Qualtrics, a secure online survey platform. This provided full information and participants confirmed eligibility and gave informed consent before completing the survey.

Correlations were computed among the measures, and two hierarchical multiple linear regression analyses were conducted with physical and mental quality of life (PCS and MCS scores) as the dependent variables. Predictor variables were added using the stepwise method in four blocks: 1) demographic factors and menstrual history (age, whether participants had children, whether participants were married or cohabiting, age of first period and age of first painful period); 2) period pain (pain duration and severity, and congestive vs. spasmodic dysmenorrhea); 3) analgesic use (numbers of prescription and OTC analgesic doses during periods and days per period of analgesic use); 4) coping and acceptance (scores for catastrophizing, diversion, reinterpreting, cognitive coping and pain acceptance).

The criteria for entry and removal were $p < 0.05$ and $p > 0.10$ respectively. Where regression coefficients for one predictor variable were significant on entry but non-significant when other predictor variables were added, Sobel tests were used to test mediation,[25,26] which occurs when a mediating variable "accounts for the relationship between the predictor and the criterion".[27]

RESULTS

The survey was viewed by 226 people of whom 26 (11.5%) did not meet the criteria or declined to take part, 55 (24.3%) began but did not complete the survey, and 145 (64.2) completed the survey. Nearly all participants (91%; n=132) lived in the UK, with the remainder in Australia, Croatia, Cyprus, Dominican Republic, Germany, New Zealand, Northern Ireland, Scotland, Singapore and Turkey. Two-thirds (67.6%; n=98) were students; five (3.5%) were unemployed; one each (0.7%) were retired, disabled and a child-carer; and the remainder worked in a range of occupations including teaching, healthcare and retail.

Participant details are given in Table 1. Approximately equal proportions were single, married/cohabiting and in a relationship but not cohabiting. A quarter of participants (24.8%; n=36) had children. Based on MSQ scores, two-thirds had congestive and one-third spasmodic dysmenorrhea. There were 123 (84.8%) who reported taking analgesics for menstrual pain, most commonly acetaminophen (paracetamol), aspirin, codeine, hyoscine (Buscopan™), paracetamol-codeine combinations eg. Co-codamol,™ and non-steroidal anti-inflammatory drugs (NSAIDs) including enantyum, ibuprofen, mefenamic acid and naproxen.

Descriptive scores are given in Table 2 and correlations in Table 3. Greater physical quality of life was associated with shorter pain duration and less severe pain, less prescribed analgesic use, fewer days' analgesic use, less catastrophizing and diversion, more cognitive coping and more pain acceptance. Greater mental quality of life was associated with being older at first painful period, less severe pain, spasmodic rather than congestive dysmenorrhea, less catastrophizing and more pain acceptance.

Table 1. Participant information

	N (%)
Relationship status	
Single	48 (33.1%)
In a relationship but not cohabiting	50 (34.5%)
Married/cohabiting	47 (32.4%)
Number of children	
None	109 (75.2%)
One	20 (13.8%)
Two	12 (8.3%)
Three	4 (2.8%)
Type of dysmenorrhea	
Congestive	92 (63.4%)
Spasmodic	53 (36.6%)
Analgesics used	
None	22 (15.2%)
Over the counter (OTC) analgesics	91 (62.8%)
Prescribed analgesics	9 (6.2%)
OTC and prescribed analgesics	23 (15.9%)
	Mean (SD; range)
Current age, years	24.55 (7.87; 18–50)
Age first period, years	12.44 (1.58; 7–17)
Age first painful period, years	14.94 (3.64; 7–37)
Period pain duration, days per period	3.29 (1.65; 1–10)
Menstrual pain severity, 1-10 rating	6.79 (1.55; 3–10)
Prescribed analgesic use per period, doses	2.29 (6.73; 0–48)
OTC analgesic use per period, doses	7.98 (9.31; 0–48)
Analgesic use per period, days	2.56 (1.68; 0–8)
Analgesic effectiveness, 1-5 rating[1]	2.90 (0.88; 1–5)

1. N=123 (those using analgesics).

Table 2. Descriptive scale scores

Scale	Mean	SD	Range
Catastrophising	18.63	8.90	6.0–42.0
Diversion	19.72	7.93	6.0–42.0
Reinterpreting	13.91	7.25	6.0–35.0
Cognitive coping	21.30	6.71	5.0–35.0
Pain acceptance	28.83	9.80	6.0–48.0
Physical quality of life (PCS)	45.11	8.98	22.1–63.9
Mental quality of life (MCS)	38.71	10.43	12.2–57.8

PCS=Physical component summary; MCS=Mental component summary.

Table 3. Correlations among variables

	1	2	3	4	5	6	7	8	9	10
1. Age	1.0									
2. Age first period	-0.05	1.0								
3. Age first painful period	0.17*	0.43***	1.0							
4. Period pain duration	-0.06	0.02	0.01	1.0						
5. Period pain severity	-0.06	-0.09	-0.16	0.25**	1.0					
6. Dysmenorrhea type[1]	0.20*	-0.18*	0.00	0.21*	-0.05	1.0				
7. Prescribed analgesic use	0.04	0.01	-0.10	0.26**	0.35***	-0.00	1.0			
8. OTC analgesic use	0.09	0.14	0.04	0.35***	0.12	0.03	0.22**	1.0		
9. Days analgesic use per period	0.05	0.05	-0.01	0.63***	0.34***	0.09	0.40***	0.56***	1.0	
10. Analgesic effectiveness[2]	-0.07	-0.11	-0.09	0.22*	0.02	-0.07	-0.02	0.09	0.16	1.0
11. Catastrophising	-0.18*	-0.12	-0.23**	0.26**	0.49***	-0.11	0.23**	-0.01	0.21*	0.11
12. Diversion	0.03	-0.05	-0.09	0.11	0.15	0.03	0.07	-0.15	-0.02	-0.05
13. Reinterpreting	-0.00	-0.11	-0.04	0.09	0.12	-0.03	0.21*	-0.21*	-0.01	-0.03
14. Cognitive coping	0.18*	0.10	0.28**	-0.07	-0.30***	0.13	-0.04	-0.15	-0.12	-0.12
15. Pain acceptance	0.14	0.23**	0.34***	-0.20*	-0.42***	0.03	-0.27**	-0.05	-0.20*	-0.09
16. Physical quality of life (PCS)	0.12	0.02	0.12	-0.23**	-0.36***	0.09	-0.23**	-0.13	-0.23**	-0.09
17. Mental quality of life (MCS)	0.12	0.15	0.24**	-0.16	-0.31***	-0.29***	-0.19*	-0.09	-0.12	-0.04

Table 3 continued

	11	12	13	14	15	16
11. Catastrophising	1.0					
12. Diversion	0.32***	1.0				
13. Reinterpreting	0.23**	0.45***	1.0			
14. Cognitive coping	-0.42***	0.11	0.23**	1.0		
15. Pain acceptance	-0.68***	-0.22**	-0.16	0.61***	1.0	
16. Physical quality of life (PCS)	-0.48***	-0.27**	-0.09	0.46***	0.63***	1.0
17. Mental quality of life (MCS)	-0.28**	-0.11	0.01	0.16	0.39***	0.14

1. Coded 1=spasmodic, 2=congestive.
2. N=123 for all correlations with analgesic effectiveness.
* $p <= .05$; ** $p <= .01$; *** $p <= .001$.

Older participants were also more likely to have congestive dysmenorrhea and had less catastrophising and more cognitive coping. Participants who were older at first painful period had less catastrophising, more cognitive coping and more pain acceptance. Participants with more severe menstrual pain used more prescribed analgesics and used analgesics for longer, and had more catastrophizing, less cognitive coping and less pain acceptance. Participants who used more prescribed analgesics also used more OTC analgesics and used analgesics for longer during periods, and had more catastrophising and reinterpreting and less pain acceptance.

Catastrophising, diversion and reinterpreting were positively inter-correlated. Catastrophising was negatively correlated with cognitive coping and pain acceptance. Diversion was negatively correlated with pain acceptance, and reinterpreting was positively correlated with cognitive coping.

The results of the two regression analyses are given in Table 4. For physical quality of life, being married or cohabiting was a significant positive predictor on entry in block 1, and menstrual pain severity and duration were significant negative predictors on entry in block 2 (more severe and longer pain predicted poorer quality of life). None of the measures of analgesic use were added in block 3. Pain acceptance was the only significant predictor in block 4 and contributed most to the 42.9% of the total variance in physical quality of life accounted for.

The Beta weights for being married or cohabiting, period pain severity and period pain duration were all reduced and became non-significant in the final model. Sobel tests showed that 1) the effect of being married or cohabiting was mediated by pain acceptance (Sobel=2.2389, 95% CIs 0.2617 to 4.2160, p=0.0265) but not menstrual pain severity or duration; 2) the effect of menstrual pain severity was mediated by pain acceptance (Sobel= -1.3938, 95% CIs -1.9988 to -0.7888, p<0.0001) but not menstrual pain duration; and 3) the effect of menstrual pain duration was mediated by menstrual pain severity (Sobel= -0.4273, 95% CIs -0.7808 to -0.0739 p=0.0178) and pain acceptance (Sobel= -0.6580, 95% CIs -1.2049 to -0.1111 p=0.0184).

For mental quality of life, age of first painful period was a significant positive predictor in block 1 but not in the final model. Menstrual pain severity and dysmenorrhea type were significant negative predictors in block 2 and remained significant in the final model. No measures of analgesic use were added in block 3. Pain acceptance was a significant positive predictor in block 4.

The Beta weight for age of first painful period was reduced and became non-significant in the final model. Sobel tests showed that the effect of age of first painful period was mediated by pain acceptance (Sobel=0.3424, 95% CIs 0.1183 to 0.5666, p=0.0027) but not menstrual pain severity or dysmenorrhea type.

DISCUSSION

Pain acceptance was the only independent predictor of physical quality of life, and was also independently predictive of mental quality of life, along with menstrual pain severity and congestive type dysmenorrhea, whereas the pain coping measures were not independently predictive of either aspect of quality of life. This resembles findings among people with other chronic pain conditions,[17-20] suggesting that approaches developed for other types of chronic pain could be effective for menstrual pain.

Acceptance-based interventions are based on Acceptance and Commitment Therapy (ACT)[28] and the theory of psychological flexibility.[29] This approach has been applied for a range of chronic medical conditions[30] and has been applied especially widely for people with chronic pain.[31,32]

Table 4. Summary of regression analyses predicting physical and mental quality of life

Block and predictor variable	R^2	Adj. R^2	ΔR^2	Entry Beta	Final Beta
Dependent variable: physical component summary score (PCS)					
1. Demographics and menstrual history	0.029	0.022	0.029*		
Married or **c**ohabiting				0.170*	0.074
2. Period pain	0.182	0.164	.153***		
Period pain severity				-0.342***	-0.082
Period pain duration				-0.198*	-0.126
3. Analgesic use	No variables entered				
4. Coping and acceptance	0.429	0.412	0.247***		
Pain acceptance				0.562***	0.562***
Dependent variable: mental component summary score (MCS)					
1. Demographics and menstrual history	0.053	0.047	0.053**		
Age first painful period				0.231**	0.120
2. Period pain	0.223	0.206	0.169***		
Period pain severity				-0.283**	-0.214**
Dysmenorrhea type				-0.303***	-0.308**
3. Analgesic use	No variables entered				
4. Coping and acceptance	0.269	0.247	0.046**		
Pain acceptance				0.249**	0.249**

R^2= proportions of variance accounted for; ΔR^2 = change in R^2; Beta weights = standardized regression coefficients. Variables were added to the model using the stepwise method in each block. The criteria for entry and removal were $p < 0.05$ and $p > 0.10$ respectively. Only predictor variables that were entered are shown in the table. * $p <= .05$; ** $p <= .01$; *** $p <= .001$.

The effect of being married or cohabiting on physical quality of life was mediated by pain acceptance, which suggests that living with a partner supports women in continuing with activities despite their menstrual pain. Interventions should therefore consider that women living alone face greater challenges in maintaining physical quality of life, and that women's partners could support them in maintaining or increasing their engagement in activities of everyday life.

Pain acceptance also mediated the effect of menstrual pain severity on physical quality of life, suggesting that menstrual pain impacts on physical quality of life partly because it reduces engagement in activities of everyday life.

Pain acceptance also mediated the effect of age of first painful period on mental quality of life. This indicates firstly that women whose painful periods began earlier in life are more at risk of impaired mental quality of life, suggesting a need for early interventions for young women with dysmenorrhea. Secondly, it indicates that menstrual pain that begins earlier in life impacts more on mental quality of life partly because it reduces young women's engagement in activities in everyday life. Acceptance-based interventions that specifically support the continuation of everyday activities in spite of menstrual pain could therefore help protect young women against the impact on mental quality of life.

Dysmenorrhea type and menstrual pain severity, however, remained independently predictive of mental quality of life even after pain acceptance was added to the model. Congestive dysmenorrhea was associated with poorer quality of life, so this type of dysmenorrhea should be treated as a risk factor for impaired mental quality of life.

It is no surprise that severity of menstrual pain had a direct, unmediated negative influence on mental quality of life, for pain and quality of life are very closely related.[33] Reviews concluded that every type and source of pain impacts negatively on quality of life and that effective analgesic

therapy can improve quality of life.[34] However, no measure of analgesic use was independently predictive of quality of life, despite the fact that prescribed analgesic use was negatively correlated with both physical and mental quality of life, and that days' analgesic use per period was negatively correlated with physical quality of life.

Perhaps analgesic use was not measured sensitively or accurately enough to predict quality of life, or perhaps the analgesics used by participants were not effective. The analgesics reported are all recommended for mild to moderate pain; no participants reported using strong opioid medication, and several participants noted in the survey that the analgesics they used had little effect. The rating of analgesic effectiveness was also not correlated with quality of life, and in separate regression analyses (because they involved only the 123 participants who used analgesics), participants' ratings of analgesic effectiveness were not predictive of either physical or mental quality of life. However, it remains possible that quality of life among women with menstrual pain could be increased by improved analgesic pain management, provided this can be achieved without risking analgesic dependence.[35]

Two limitations of the study are that the sample size was not large and all the data were self-reported, with no objective clinical data. Future research might explore the role of pain acceptance among larger samples of women with dysmenorrhea in the general population, or clinical samples of women seeking or receiving medical help for dysmenorrhea, including clinical measures.

The study findings do not have immediate clinical applications, but it is possible that they could have in the future, for their most obvious implication is that interventions to support the quality of life of women affected by dysmenorrhea could be based on pain acceptance or Acceptance and Commitment Therapy. These have been developed for complex chronic pain, chronic fatigue syndrome, fibromyalgia, rheumatoid arthritis and whiplash-associated disorders,[31] but not to our knowledge for women with menstrual pain.

Any such intervention for women with menstrual pain should be carefully designed, for pain acceptance has multiple understandings and should be interpreted flexibly in different contexts,[36] but it should be feasible to develop an effective acceptance-based intervention that is specifically tailored for women with menstrual pain. Online acceptance-based interventions may be especially useful for women with dysmenorrhea as they enable convenient and flexible access to support, and these have been developed and evaluated for people with other types of chronic pain.[37,38] Interventions like that would aim to help women with menstrual pain maintain or improve their quality of life through audio- or video-recorded exercises that provide alternatives to what are often ineffective strategies to control pain. These can include mindfulness, diffusion (distancing from negative thoughts), formulating goals consistent with one's values, and planning committed action towards those goals. [37,38]

Considering the very high global prevalence of dysmenorrhea[2,3] and the number and range of interventions that have been evaluated for other types of chronic pain, menstrual pain is a neglected type of pain that must contribute to gender inequality in employment and society. Interventions to help women with menstrual pain maintain their quality of life could therefore have positive impacts on the economy and society as well as on the physical and mental wellbeing of large numbers of women. These results suggest that initiatives to increase pain acceptance among women with menstrual pain are worthwhile.

Acknowledgement

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