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CLINICAL PAPER

Health, work and spirituality values predict attendance at pelvic floor muscle training sessions

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Abstract

Patient life values have been shown to influence outcomes in several healthcare contexts, but the impact of these beliefs on pelvic floor muscle (PFM) training (PFMT) is unknown. To investigate this topic, the nature of life values in women with pelvic floor dysfunction, and the relationship of these beliefs with their attendance at PFMT sessions, were assessed in two prospective observational studies. Consecutively referred adult females with pelvic floor dysfunction were recruited at a women's health physiotherapy clinic in the urogynaecological outpatient unit of a UK hospital. The attendance of two cohorts of patients at sessions of a 6-month PFMT programme was monitored, and their values were measured using either the Personal Values Questionnaire II (cohort 1) or the Life Values Inventory (cohort 2). Additionally, the participants' PFM strength was measured using the modified Oxford scale and the Queensland Female Pelvic Floor Questionnaire. Although patients in both cohorts reported that their relationships with their family and friends were the most important aspects of their lives, it was health, work/achievement and spiritual values that predicted attendance at the PFMT sessions. Patient values have an impact on physiotherapy adherence, and should be considered in future assessment/screening procedures.

Keywords: patient attendance, social values, spirituality, urinary incontinence.

Introduction

Pelvic floor muscle (PFM) training (PFMT) for pelvic floor dysfunction can be effective (Hay-Smith *et al.* 2008; Osborne *et al.* 2016a) and cost-efficient (Hay-Smith & Dumoulin 2006; NICE 2006). However, a range of psychological factors are associated with patient adherence to PFMT, and the outcomes of these programmes (Goode *et al.* 2008; Dumoulin *et al.* 2010; Khan *et al.* 2013). Identifying the determinants predicting treatment adherence and engagement remains an objective for service planning and development. Such factors are little understood at present, but may include patient life values, which, in other healthcare contexts, have been noted to promote health co-production (Pignone *et al.* 2013) and higher patient satisfaction with the outcomes of treatment (Gallan *et al.* 2013; Peile 2013). Knowledge of the types of beliefs held by a patient group is important for enhancing their motivation (Osborne *et al.* 2016a), and for understanding the way in which patients gauge the success of a treatment (Osborne *et al.* 2016b). However, there have been no studies relating such patient values to their adherence to PFMT, and acquiring this information would help to support patients to co-produce their health outcomes (Osborne *et al.* 2016a).

Measurement of patient values is a relatively new area (Knight 2013; Pignone *et al.* 2013), and a key problem has been the extent to which such values can be captured. However, the development of the Personal Values Questionnaire II (PVQ-II; Blackledge *et al.* 2010), and the Life Values Inventory (LVI; Crace & Brown 1996), provides some means of assessing the strength of a range of values. These two tools adopt

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somewhat different ways from each another of eliciting values from respondents, and focus on slightly different, if overlapping, value domains. The PVQ-II asks patients to rate the importance of nine areas of their lives, leaving the precise definition of those domains to the participant, and it also focuses on areas of activity (e.g. work and health) rather than personal traits. Conversely, the LVI asks respondents specific questions related to 14 value domains, including both activities and personal traits (e.g. achievement).

The present study employed two prospective cohorts of women with pelvic floor dysfunction who had been referred for PFMT; for each of the two cohorts, a different questionnaire was used to assess patient values at intake and the impact of these beliefs on subsequent PFMT attendance (giving the participants both questionnaires at once was thought to be too onerous). The aim was to provide a preliminary illumination of the life values held by women with pelvic floor dysfunction who attended PFMT group sessions, and explore any relationship between these values and their attendance. The assumption was that any common sets of values emerging from the two different questionnaires across the cohorts would be the critical ones to focus on in future work.

Participants and methods

Outcome measures

The modified Oxford scale (MOS; Brink *et al.* 1994) is an objective measure of PFM contraction strength, which is scored on a six-point scale from 0 (none) to 5 (very strong). The technique is reliable for this type of research (Sampselle *et al.* 1989; Brink *et al.* 1994).

The Queensland Female Pelvic Floor Questionnaire (QFPFQ; Baessler *et al.* 2008) is a self-administered assessment of bladder, bowel, prolapse and sexual dysfunction. Each subscale is scored from 0 to 10, and the sum gives an overall pelvic floor dysfunction score (range = 0–40); greater scores represent poorer function. Its internal reliability (Cronbach's α) ranges from 0.72 to 0.95 (Baessler *et al.* 2008).

The Personal Values Questionnaire II (PVQ-II; Blackledge *et al.* 2010) covers: family relationships; friendships/social relationships; couples/romantic relationships; work/career; education–schooling/personal growth and development; recreation/leisure/sport; spirituality/religion; community/citizenship; and health/physical well-being. There are eight questions for each domain, each of which is rated on a five-point scale, giving a range of 8 (weak) to 40 (strong) for the strength of each domain. It has a Cronbach's α of 0.71–0.80 (Doi *et al.* 2016).

The Life Values Inventory (LVI; Crace & Brown 1996) assesses: achievement; belonging; concern for the environment; concern for others; creativity; financial prosperity; health and activity; humility; independence; loyalty to family or group; privacy; responsibility; scientific understanding; and spirituality. The scale has 42 questions, each of which has three items that are answered using a five-point Likert rating scale, giving a range of 3–15 for each value: (3) not important; and (15) highly significant.

Intervention

The PFMT programme consisted of six, 60-min group sessions (with seven or eight patients per group) within the outpatient physiotherapy department of a UK hospital. Each session provided training in PFM exercises, and advice about the behavioural management of continence, such as: fluid intake; bladder drill; how to contract the PFMs before and during increases in abdominal pressure (the "Knack" manoeuvre; Miller *et al.* 2008); double voiding; and helpful activities. The sessions also provided information regarding: (1) the anatomy and function of the PFMs; (2) back and spinal care and posture; (3) medical and surgical management; (4) psychosexual issues; (5) the anatomy of the intestines and bowel, and colorectal problems; and (6) physiotherapy management of pelvic floor dysfunction and available aids. Patients were directed to practice the exercises at home on a daily basis (i.e. mornings and evenings) between the sessions.

Procedure

On admittance, the participants in each of the two consecutive cohorts underwent an objective assessment of their PFM strength by a clinical physiotherapist (who was blind to their scores on the life values questionnaires) using the MOS. They also completed subjective assessments of their condition using the QFPFQ, and provided data about their demographic characteristics. The participants also completed one of two questionnaires that assessed their life values. The PVQ-II was used for cohort 1, and the LVI was given to cohort 2, who were recruited later. The participants then progressed through the physiotherapy programme, attending one session every month for 6 months.

Table 1. Mean Personal Value Questionnaire II (PVQ-II) scores [± standard deviation (SD)] at intake; Pearson correlations with age, and objective (modified Oxford scale) and subjective symptoms (Queensland Female Pelvic Floor Questionnaire); and point-biserial correlations with body mass index (BMI): (0) overweight; and (1) normal weight

Domain	PVQ-II score (mean ± SD)	Pearson correlation			Point-biserial correlation with BMI
			Symptoms		
		Age	Objective	Subjective	
Family relationships	35.45 ± 2.63	–0.039	0.202	–0.127	0.121
Friendships/social relationships	32.58 ± 4.05	0.051	0.178	–0.062	0.178
Couples/romantic relationships	34.60 ± 3.29	–0.124	0.139	–0.217	0.183
Work/career	29.78 ± 3.47	–0.102	0.030	0.101	0.030
Education–schooling/personal growth and development	28.59 ± 3.44	–0.198	–0.020	–0.139	0.270
Recreation/leisure/sport	30.16 ± 4.08	0.035	–0.148	–0.011	0.051
Spirituality/religion	24.83 ± 5.97	0.214	–0.078	–0.160	–0.018
Community/citizenship	28.35 ± 4.58	0.097	–0.165	0.012	–0.135
Health/physical well-being	30.73 ± 3.98	–0.077	0.170	–0.013	0.088

*$P < 0.05$.
**$P < 0.01$.
***$P < 0.001$.

Results

Cohort 1: Personal Values Questionnaire II

One hundred and twenty-four consecutively referred adult female patients were invited to participate in the present study, and 96 agreed and completed the questionnaires. At the start of the intervention, the mean age [± standard deviation (SD)] of the participants was 48.83 ± 13.41 years (range = 21–83 years). The patients were referred for either one or a combination of the following symptoms: stress urinary incontinence ($n = 16$, 16.6%); urge urinary incontinence ($n = 3$, 3.1%); mixed urinary incontinence ($n = 33$, 34.4%); faecal incontinence ($n = 2$, 2.1%); prolapse ($n = 15$, 15.6%); and prolapse and incontinence ($n = 27$, 28.2%). Patients with perineal tears and those who were in postoperative recovery were excluded from the study. The mean MOS score (± SD) in the objective assessment of PFM function was 2.67 ± 0.97 (range = 1–4), and the mean total QFPFQ score in the subjective assessment was 28.93 ± 14.20 (range = 1–63).

The sample was divided into those who attended every session of the course (completers), and those who did not (non-completers). There were 47 completers (49%) and 49 non-completers (51%). At the start of the intervention, the mean ages (± SD) of the completers and non-completers were 46.89 ± 12.43 and 51.03 ± 12.52 years, respectively. The difference in age between the cohorts did not reach statistical significance [$t_{(94)} = 1.25$, $P > 0.20$, $d = 0.38$] when analysed using a $P < 0.05$ criterion (which was applied for all subsequent analyses). The mean baseline objective PFM strengths (± SD) of the completers and non-completers were 2.75 ± 0.83 and 2.20 ± 1.32, respectively, as calculated using the MOS. This difference was not statistically significant [$t_{(94)} = 1.56$, $P > 0.10$, $d = 0.28$]. The mean baseline subjective degrees of pelvic floor dysfunction (± SD) for the completers and non-completers were 30.09 ± 13.22 and 27.18 ± 15.57, respectively. The difference between the two groups was not statistically significant ($t < 1$, $d = 0.21$). At the start of the intervention, the participants' body mass indices (BMIs) were classified as "healthy" (i.e. in the normal range, 18.5–24.9) or "unhealthy" (i.e. outside the normal range, meaning consistently overweight, > 25.0). There were 43% completers and 50% non-completers in the healthy range, and this difference was not statistically significant [$\chi^2_{(1)} = 1.68$, $P > 0.10$, $\varphi = 0.194$].

Table 1 shows: the participants' mean PVQ-II scores at intake; Pearson correlations with age, and objective (MOS) and subjective symptoms (QFPFQ); and point biserial correlations with BMI [(0) overweight; and (1) normal weight]. The personal connections of the participants (i.e. "family relationships", "friendships/social relationships" and "couples/romantic relationships") were the most strongly held values, and "community/citizenship" and "spirituality/religion" were the least strongly held. A repeated-measures analysis of variance (ANOVA) conducted on the PVQ-II data, revealed that the strengths of these differed from each other to a statistically significant extent [$F_{(8,752)} = 85.29$, $P < 0.001$, $\eta^2_p = 0.476$].

Figure 1 shows the group-mean PVQ-II scores of the completer and non-completer cohorts at the start of the intervention. Statistically significantly stronger values were held by completers

in terms of "work/career" [$t_{(94)}$ = 5.20, $P < 0.001$, d = 1.060], "spirituality/religion" [$t_{(94)}$ = 2.45, $P < 0.01$, d = 0.51], "community/citizenship" [$t_{(94)}$ = 2.68, $P < 0.01$, d = 0.55] and "health/physical well-being" [$t_{(94)}$ = 6.99, $P < 0.001$, d = 1.48], but not with regard to "family relationships" [$t_{(94)}$ = 1.28, $P > 0.20$, d = 0.27], "friendships/social relationships" ($t < 1$, d = 0.10), "couples/romantic relationships" [$t_{(94)}$ = 1.21, $P > 0.20$, d = 0.28], "education–schooling/personal growth and development" ($t < 1$, d = 0.21) and "recreation/leisure/sport" ($t < 1$, d = 0.07).

A logistic regression was conducted at the start of the intervention in order to determine whether any value domains predicted attendance at the PFMT sessions. All the life-value domains at baseline were used as predictors, and when taken together, the model containing the values reached statistical significance in predicting attendance [log-likelihood ratio (–2LL) = 57.74, $P < 0.01$]. When assessing the individual contributions of each life value to this model, "health/physical well-being" [β = 0.461, $P < 0.001$, odds ratio (OR) = 1.585], "work/career" (β = 0.481, $P < 0.001$, OR = 1.617) and "spirituality/religion" (β =0.118, $P < 0.05$, OR = 1.125) all independently predicted attendance. The other types of values (i.e. "community/citizenship", "family relationships", "friendships/social relationships", "couples/romantic relationships", "education–schooling/personal growth and development" and "recreation/leisure/sport") did not reach statistical significance in relation to attendance (all Ps > 0.40, all ORs < 0.30).

Cohort 2: Life Values Inventory

Forty-three consecutively referred adult female patients from the next cohort were invited to participate, and 36 agreed and completed the questionnaires. Their mean age (± SD) at the start of the intervention was 52.56 ± 11.76 years (range = 25–67 years). The participants were referred for either one or a combination of the following symptoms: stress urinary incontinence (n = 3, 8.3%); urge urinary incontinence (n = 1, 2.8%); mixed urinary incontinence (n = 18, 50.0%); prolapse (n = 2, 5.6%); and prolapse and incontinence (n = 12, 33.3%). Patients with perineal tears and those who were in postoperative recovery were excluded. The mean MOS score (± SD) for the objective assessment of PFM function at baseline was 2.25 ± 0.67 (range = 1–3), and the mean baseline subjective assessment of pelvic floor dysfunction (total QFPFQ score) was 39.85 ± 19.05 (range = 13–88).

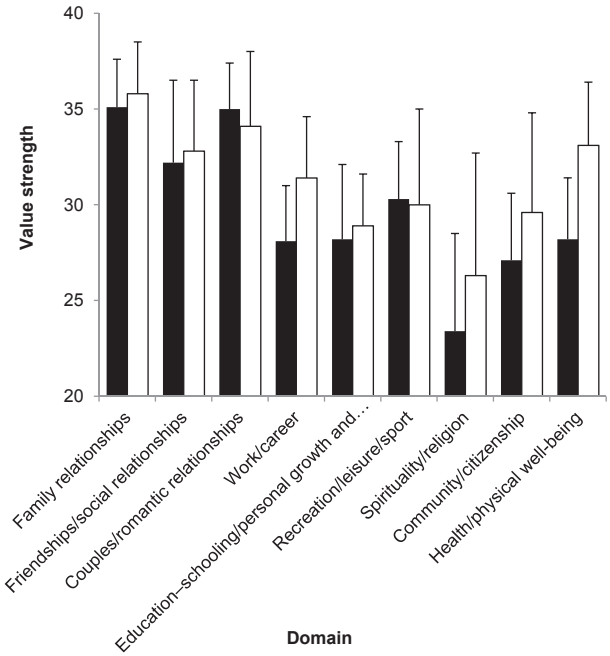

Figure 1. Group-mean Personal Values Questionnaire II scores (with standard deviations) across the nine domains for the completer (□) and non-completer (■) cohorts.

There were 19 (52.8%) completers and 17 (47.2% non-completers). At baseline, the completers and non-completers had mean ages of 53.00 ± 11.37 and 52.06 ± 12.51 years, which were not statistically significantly different from one another ($t < 1$, d = 0.08). The mean MOS scores for objective PFM function at the start of the intervention were 2.45 ± 0.49 and 1.75 ± 0.86 for the completers for non-completers, respectively. This difference did not reach statistical significance ($t < 1$, d = 0.16). The mean QFPFQ scores for subjective pelvic floor dysfunction at the start of the intervention were 44.82 ± 19.99 and 33.93 ± 16.57 for the completers and non-completers, respectively. This difference did not reach statistical significance ($t < 1$, d = 0.25). The BMI scores at baseline were classed as "healthy" or "unhealthy", and 39% of completers and 30% of non-completers were in the healthy range. This difference was not statistically significant [$\chi^2_{(1)}$ = 1.71, $P > 0.60$, φ = 0.0810].

Table 2 shows: the participants' mean LVI scores at intake; Pearson correlations with age, and objective (MOS) and subjective symptoms (QFPFQ); and point biserial correlations with BMI [(0) overweight; and (1) normal weight]. "Concern for others" and "responsibility" were the most strongly held values, and "financial prosperity" and "scientific understanding" were the least strongly held. A repeated-measures ANOVA revealed that the strengths of the values differed from one another, and that these differences

Table 2. Mean Life Values Inventory (LVI) scores [± standard deviation (SD)] at intake; Pearson correlations with age, and objective (modified Oxford scale) and subjective symptoms (Queensland Female Pelvic Floor Questionnaire); and point-biserial correlations with body mass index (BMI): (0) overweight; and (1) normal weight

Domain	LVI score (mean ± SD)	Pearson correlation			Point-biserial correlation with BMI
		Age	Symptoms		
			Objective	Subjective	
Achievement	10.86 ± 1.89	–0.002	0.415*	0.425*	0.196
Belonging	10.17 ± 2.08	–0.120	–0.088	0.448**	0.047
Concern for the environment	10.67 ± 2.61	0.154	0.270	0.306	0.513**
Concern for others	12.31 ± 2.41	0.162	0.116	0.310	0.107
Creativity	10.86 ± 2.53	0.144	0.338	0.275	0.266
Financial prosperity	8.72 ± 2.40	–0.298	–0.277	–0.275	0.214
Health and activity	9.67 ± 2.48	0.017	0.338	0.143	0.440**
Humility	9.33 ± 2.21	0.014	–0.226	0.092	0.119
Independence	11.14 ± 1.95	–0.080	0.347	0.197	0.110
Loyalty to family or group	11.89 ± 2.51	0.022	0.320	0.352*	0.075
Privacy	10.17 ± 2.54	0.271	0.232	0.259	–0.184
Responsibility	12.67 ± 2.29	0.066	0.201	0.349*	0.187
Scientific understanding	8.61 ± 2.45	0.156	–0.192	0.218	–0.037
Spirituality	9.22 ± 3.38	0.271	–0.245	0.236	–0.210

*$P < 0.05$.
**$P < 0.01$.
***$P < 0.001$.

reached statistical significance [$F_{(3,455)} = 17.52$, $P < 0.001$, $\eta^2_p = 0.334$].

Figure 2 shows the group-mean LVI scores for the completer and non-completer groups at the start of the intervention. Analyses revealed that there were stronger values held by completers that reached statistical significance in terms of: "achievement" [$t_{(34)} = 2.36$, $P < 0.01$, $d = 0.82$]; "creativity" [$t_{(34)} = 3.01$, $P < 0.001$, $d = 1.08$]; "health and activity" [$t_{(34)} = 2.50$, $P < 0.01$, $d = 0.83$]; "independence" [$t_{(34)} = 3.36$, $P < 0.001$), $d = 1.11$]; "loyalty to family or group" [$t_{(34)} = 3.30$, $P < 0.01$, $d = 1.13$]; and "spirituality" [$t_{(34)} = 2.52$, $P < 0.01$, $d = 0.90$]. The values that did not reach clinical significance were: "belonging" ($t < 1$, $d = 0.07$); "concern for the environment" [$t_{(34)} = 2.05$, $P < 0.05$, $d = 0.28$]; "concern for others" ($t < 1$, $d = 0.21$); "financial prosperity" ($t < 1$, $d = 0.12$); "humility" [$t_{(34)} = 1.48$, $P < 0.10$, $d = 0.32$]; "privacy" ($t < 1$, $d = 0.23$); "responsibility" [$t_{(34)} = 1.53$, $P < 0.10$, $d = 0.20$); and "scientific understanding" ($t < 1$, $d = 0.19$).

A logistic regression was conducted to determine whether the life-value domain scores recorded at the start of the intervention predicted attendance. All the baseline life values served as

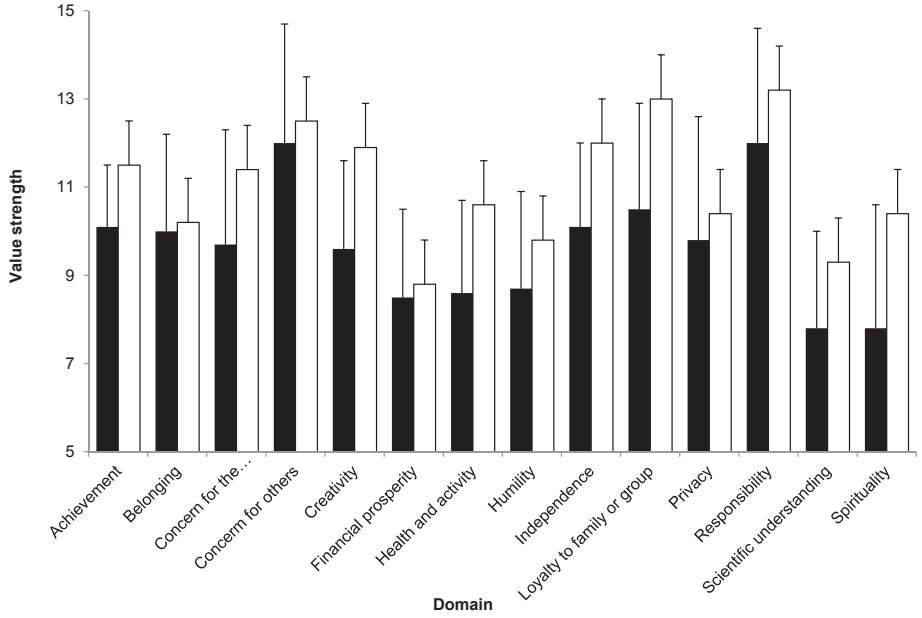

Figure 2. Group-mean Life Values Inventory scores (with standard deviations) across the 14 domains for the completer (□) and non-completer (■) cohorts.

predictors, and this analysis revealed that, taken together, these significantly predicted attendance (–2LL = 49.75, $P < 0.001$). When the contributions of the individual life vales were examined, "health and activity" (β = 15.36, $P < 0.01$, OR = 4.321), "achievement" (β = 4.554, $P < 0.05$, OR = 0.011), "creativity" (β = 0.793, $P < 0.01$, OR = 0.675), "independence" (β = 0.690, $P < 0.01$, OR = 0.343), "loyalty to family or group" (β = 0.695, $P < 0.01$, OR = 0.432) and "spirituality" (β = 0.218, $P < 0.05$, OR = 0.125) independently predicted attendance, but the other types of life values (i.e. "belonging", "concern for the environment", "concern for others", "financial prosperity", "humility", "privacy", "responsibility" and "scientific understanding") did not reach statistical significance in relation to attendance (all Ps > 0.30, all ORs < 0.20).

Discussion

The present study was an initial investigation of the life values held by women with pelvic floor dysfunction who were referred for PFMT, and the relationship between these beliefs and attendance at sessions. Establishing such information may lead to a better understanding of: the views of patients (Gallan *et al.* 2013; Peile 2013); the kinds of things that they regard as important to gain from treatment (Osborne *et al.* 2016b); and the patient values that healthcare professionals should help to support in order to enhance treatment attendance (Osborne *et al.* 2016a). For both cohorts, it was demonstrated that the areas that were important were patients' relationships with their families, friends and significant others. In contrast, work and educational achievement (cohort 1), and financial success (cohort 2), were not regarded as important. Similarly, spirituality (both cohorts) and scientific understanding (cohort 2) were not strongly valued. That the two cohorts produced broadly similar results to one another suggests that confidence can be placed in the findings with regard to the values that were important for this patient group.

The tendency of women to hold such relationship values strongly has previously been demonstrated (Markle *et al.* 2007; Lindhardt & Berthelsen 2017). Relationship values have also been found to be very important to those with chronic illnesses, certainly to a greater extent than financial issues (Osborne *et al.* 2012, 2014). In fact, relationships were rated more strongly than the patients' own health in both current cohorts. The relatively low strength of spiritual values overall may reflect that the study was conducted in the largely secular UK, and this result may be different in other countries. It is important to know about such values since these may inform assessments of the likelihood of the successful outcome of interventions for this patient population: any improvement in the patients' ability to support these values may be regarded as the subjective marker of a successful intervention.

There were also similarities across the two cohorts in terms of the values that predicted the likelihood of participants completing PFMT sessions. In particular, the more emphasis that patients placed on health, the more likely they were to attend the full programme. This finding may not be entirely surprising (Hayden 2013), but it suggests that working with the patient to improve such values may increase treatment attendance and compliance. The present study also identified work and spirituality (cohort 1), and achievement, spirituality, creativity, independence and loyalty (cohort 2) as predictors of attendance. There were no relationships found between the physical characteristics of the participants (i.e. age, severity of pelvic floor dysfunction and BMI) and attendance. This result corresponds to several previous findings that have reported no or only a limited relationship between these latter physical variables and treatment attendance/compliance (Hay-Smith & Dumoulin 2006; Dumoulin *et al.* 2010).

The value that the participants placed on work (cohort 1) or financial achievement (cohort 2) might be explained in terms of their motivation to overcome their pelvic floor dysfunction so that they could more fully engage in work or activities in which they wanted to succeed. Some of the personal traits that predict attendance seen in cohort 2 (especially loyalty and responsibility) might also be understood as being attributes that could drive a patient to attend the full course once they commit to that treatment.

The importance of spirituality for both cohorts is harder to understand; the questions from the LVI relating to this domain tend to focus on a "belief in greater powers". It might be noted that this is a cornerstone of 12-step programmes for recovery from substance abuse (Sandoz 2014; Chick 2015), and the degree to which these beliefs act to support engagement with health programmes may warrant further investigation. Another possibility is that those who answer in the affirmative to questions regarding their belief in "a greater power" also experience less "need for control" (Leotti *et al.* 2010). Lower levels

of a need for control are associated with lower levels of anxiety (Moulding & Kyrios 2006), which, in turn, are known to increase attendance at PFMT sessions (Khan *et al.* 2013).

As with any investigation, there are limitations to the present study. The samples were not particularly large, and replication of the findings would be sensible. However, the systematic duplication of the key results across two cohorts goes some way to offsetting power concerns for each individual cohort. In addition, this study did not investigate whether different forms of pelvic floor dysfunction are associated with different values and different relationships with attendance. The manner in which values were measured is new to PFM physiotherapy research, and the study's validity will need to be further established. To the extent that similar life-value domains were noted as important across the two cohorts, the results suggest that these findings are robust. A common problem emerging from both cohorts was that the participants commented that the questionnaires were rather long, and further work might seek to reduce the size of the tools.

In summary, the present study found that certain life values were related to patient attendance at PFMT sessions, particularly health values, values related to work/achievement, and those related to spirituality, loyalty and responsibility. It was also noted the participants in both cohorts valued relationships more strongly than any other life-value domain. One implication of these findings is that supporting patients to hold values that predict attendance, possibly by focusing on health values, might enhance their attendance at PFMT sessions for pelvic floor dysfunction.

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