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RESEARCH ARTICLE

# The impact of fatigue on people with Fibromyalgia Syndrome: A survey

Martina McToal[1] | Rachel Christina McVeigh[2] | Joseph G. McVeigh[3]

[1]Institute of Nursing and Health Research, School of Health Sciences, Ulster University, Newtownabbey, UK

[2]Stepping Hill Hospital, Stockport NHS Foundation Trust Stepping Hill Hospital, Stockport, UK

[3]Discipline of Physiotherapy, School of Clinical Therapies, College of Medicine and Health, University College Cork, Cork, Ireland

**Correspondence**
Joseph G. McVeigh, Discipline of Physiotherapy, School of Clinical Therapies, College of Medicine and Health, University College Cork, Cork, Ireland.
Email: joseph.mcveigh@ucc.ie

## Abstract

**Introduction:** Fibromyalgia syndrome (FMS) is a common pain syndrome associated with fatigue and anxiety. The aim of this survey was to determine the impact of fatigue on the quality of life (QoL) of people with FMS and to explore the relationships between fatigue, pain, and anxiety.

**Methods:** A postal survey was conducted among support groups. Demographic data were collected and participants were asked to complete the Multi-dimensional Assessment of Fatigue Scale (MAF) and two visual analog scales (VAS) measuring pain and anxiety. Data were analysed using descriptive statistics, and relationships between variables were explored using Pearson's correlation coefficient and Fisher's Exact Probability Test. Ethical approval was granted from Ulster University's research ethics committee.

**Results:** A response rate of 52.5% was achieved (105/200). Fatigue was found to severely impact the QoL of those with FMS. From the MAF, a mean Global Fatigue Index score of 40.7 (range 1 = no fatigue—50 = severe fatigue) was calculated. Fatigue was significantly associated with both pain ($r = 0.674$) and anxiety ($r = 0.546$) (both $p$ values $< 0.0001$), and no significant relationship was found between the duration of FMS and fatigue ($r = 0.106$; $p = 0.320$).

**Conclusion:** Fatigue has a major impact on the QoL of patients with FMS. There is a strong relationship between fatigue and other variables such as pain and anxiety. However, there is no relationship between the time since diagnosis and fatigue experienced. Fatigue management should feature highly in any treatment programme for those with FMS.

KEYWORDS
chronic pain, fatigue, fibromyalgia, quality of life, survey

## 1 | INTRODUCTION

Fibromyalgia syndrome (FMS) is a common, but controversial, chronic pain syndrome in which people with FMS experience widespread pain, fatigue, sleep dysfunction and many other symptoms including anxiety and depression (Häuser & Fitzcharles, 2018). There is much debate on FMS, often centring on the diagnosis. The first accepted diagnostic criteria for FMS was that proposed by the American College of Rheumatology (ACR) and specified the presence of painful response to a minimum of 11 tender points (Wolfe et al., 1990). The diagnostic

criteria were updated in 2010 and reviewed again in 2016 to include a Widespread Pain Index and the Symptom Severity (SS) Scale (Wolfe et al., 2010, 2016). In the revised FMS classification criteria, the requirement for patients to fulfil the tender point criteria was removed and the focus shifted to measure symptoms such as fatigue, sleep dysfunction and cognitive difficulties (Wolfe et al., 2010).

Although the hallmark of FMS is chronic unrelenting pain, fatigue constitutes one of the most troublesome symptoms of the disorder (Estévez-López et al., 2021). Fatigue has a prevalence of 82% among people with FMS (Overman et al., 2016), but it has been argued that the 1990 ACR criteria failed to capture the essence of FMS by excluding key symptoms of fatigue and sleep difficulties from the classification criteria (Galvez-Sánchez and del Paso, 2020). This, and the fact that fatigue management is not a priority among clinicians (McVeigh et al., 2004) might explain why fatigue in FMS, in comparison to pain, has received only limited scrutiny in the literature (Estévez-López et al., 2021).

There is no doubt that FMS has a substantial impact on the lives of sufferers. Those living with FMS report a broad spectrum of symptoms, including pain, fatigue, sleep disturbance, memory problems, anxiety, depression, headaches, and dizziness (Russell et al., 2018). The combined impact of these symptoms is often devastating for the patient's quality of life (QoL) (Verbunt et al., 2008) and renders the sufferer unable to perform physical activity (Russell et al., 2018) or carry out the normal Activities of Daily Living (ADL) (Arnold et al., 2008). The perceived level of disability among women with FMS was investigated by Horta-Baas and Romero-Figueroa (2019). This cross-sectional study recruited 115 women with FMS and assessed their level of disability using the World Health Organization Disability Assessment Schedule 2.0 (Horta-Baas & Romero-Figueroa, 2019). Almost all participants (99%, $n = 114$) were classed as having a disability and 40.87% ($n = 47$) were classed as having moderate to severe disability.

Fatigue has long been recognised to be a major problem in FMS. Wolfe et al. (1996) reported that fatigue was significantly greater in those with FMS (76%) than in patients with rheumatoid arthritis (41.7%) or osteoarthritis (41.1%). Zautra et al. (2007) reported on the effect of daily fatigue on women with chronic pain conditions including rheumatoid arthritis ($n = 89$), osteoarthritis ($n = 76$) and FMS ($n = 90$). The participants completed daily diaries and questionnaires, which included questions on fatigue, sleep, pain and mood. Zautra et al. (2007) reported that those with FMS experienced more fatigue and increased daily variability in fatigue when compared with participants with other conditions. It was also found that increased positive effect was associated with lower daily fatigue in participants with FMS.

A number of studies have explored fatigue in FMS. Lukkahatai et al. (2016) developed a cluster model for factors that affect fatigue severity in FMS. The researchers included 120 participants with FMS and reported that fatigue in FMS was associated with widespread pain, symptom severity, pain intensity, pain interference, cognitive dysfunction, catastrophizing, anxiety, and depression. Bartley et al. (2018) explored daily variability in symptoms related to pain as predictors of pain and fatigue in FMS. Bartley et al. (2018) included 256 patients with FMS who completed daily diaries. Participants also completed symptom ratings recorded on a mobile device for a minimum of 14 days but up to 90 days. Data were collected on pain intensity, pain unpleasantness, fatigue, mood and anxiety. Participants were also asked to rank their current symptoms on a numerical rating scale 0–100. Higher levels of pain were reported in participants with higher levels of fatigue, depression, pain unpleasantness and anxiety.

Henriksson et al. (1992) reported the impact of fatigue on ADL's in those with FMS ($n = 58$). Using a questionnaire and a diary assessment technique, fatigue was reported to be the most disabling factor, with 90% of respondents reporting that FMS symptoms markedly influenced daily life and 33% noted that activities took longer due to slowness and necessity to rest. More recently, a focus group study by Russel et al. (2018) exploring perceptions of fatigue in people with FMS reported that participants stated that they had fundamentally changed since the onset of FMS and were unable to carry out their normal activities, including physical activity and exercise.

Research is limited in to fatigue in FMS, however, what literature there is suggests that fatigue is a major problem in FMS and its impact is severe (Estévez-López et al., 2021; Russell et al., 2018). Therefore, the aims of this study were to determine the severity, and the impact of fatigue on QoL of people with FMS and to identify the activities that are most limited by FMS. Finally, the relationship between fatigue and pain and anxiety was explored.

## 2 | METHOD

### 2.1 | Design and participants

This was a self-reported postal survey examining fatigue in people with FMS. Ethical approval was granted from Ulster University's research ethics committee and volunteers were recruited from a local patient support group (FMS Northern Ireland; FMSNI).

### 2.2 | Procedure

The chairperson of FMSNI was sent an invitation for members of FMSNI to participate in the survey. The chairperson then distributed to members two-hundred envelopes containing a copy of the questionnaire, a participant information sheet inviting participation in the survey, giving assurances of privacy and confidentiality, and a consent form. Members returned by mail, the consent form, and the questionnaire. People who indicated that they did not wish to participate in the survey were excluded from the study. Non-respondents were followed up after approximately 4 weeks. Questionnaires were stamped with an identification number for monitoring the follow-up process (Pallant, 2007).

## 3 | MATERIALS

Information collected from participants included general demographic information, age, gender, employment status, time since diagnosis and time with pain. Participants also completed the Multi-dimensional

Assessment of Fatigue Scale (MAF), and two 10-point visual analogue scales (VAS) measuring pain (1 = no pain, 10 = very severe pain) and anxiety (1 = not anxious, 10 = very anxious).

The MAF scale is a short, simple and easily completed measure of fatigue (Belza et al., 1993). The scale contains 16 items and measured five dimensions of fatigue: severity, distress caused by fatigue, degree of interference in ADLs, and timing that is, how often fatigue occurs and if it changed over the past week. Fourteen items contain numerical rating scales, and two-items have multiple-choice responses (Belza et al., 1993). Participants were asked to reflect on fatigue patterns in the previous week. For the 11 items addressing the degree to which fatigue interfered with ADL's, a box indicating no participation in the activity is available to be marked (Belza et al., 1993). The MAF is scored to give a global fatigue index (MAF-GFI). Averaged scores for ADL's are summed with questions assessing the degree, severity, distress caused by, and pattern of fatigue. The MAF-GFI ranges from 1 (no fatigue) to 50 (severe fatigue). Belza (1995), studying fatigue in rheumatoid arthritis patients, compared the MAF-GFI of the MAF scale with the Profile of Mood Status (POMS) fatigue subscale for convergent validity ($r = 0.84$, $p < 0.01$), and with the POMS vigour subscale for divergent validity ($r = -0.62$, $p < 0.01$). Stability correlations at different times ranged from 0.73 to 0.47. Cronbach's alpha was measured 0.93. Bormann et al. (2001), studied the reliability and validity of the MAF-GFI by measuring fatigue in HIV-positive adults. Cronbach's alpha, measuring internal consistency reliability scored 0.96, and construct validity was assessed using Pearson's correlation of MAF-GFI with relevant scales, all with significant relationships at or above 0.51, $p < 0.01$. Divergent validity was confirmed by comparison with the SF-36 physical health summary scores ($r = -0.80$, $p < 0.001$).

The VAS explored participants' pain and anxiety scores and was proven to be a reliable measurement tool in the original MAF scale (Belza et al., 1993).

### 3.1 | Statistical analysis

Data were analysed using Software Package for Statistical Sciences and presented using descriptive statistics, including frequency counts, percentages, means and standard deviations. Relationships between variables such as fatigue, pain, and anxiety were examined using Pearson's correlation coefficient. Fisher's Exact Probability Test was used to determine the relationship between work status and fatigue. Statistical significance was set at 0.05 and the strength of relationships was determined following suggestions by Cohen (1988): weak $r = 0.10–0.29$, moderate; $r = 0.30–0.49$ and strong; $r = 0.5–1.0$.

## 4 | RESULTS

Of the 200 questionnaires distributed, 105 were completed and returned, giving a response rate of 52.5%. Table 1 demonstrates that respondents were predominantly females (87%) with an average age 53 years. Most participants had long-term pain averaging 17 years, and it would appear that patients had been experiencing pain for some years before being diagnosed with FMS. Twenty percent of the respondents ($n = 21$) worked outside the home, with most of these people working part-time. Almost 10% of respondents were unemployed and about one third were retired; it is noteworthy that over one third of respondents reported themselves to be disabled.

### 4.1 | Fatigue

From Table 2, the overall impact of fatigue was very high with respondents mean MAF-GFI (SD) 40.7 (6.9) where 1 = no fatigue and 50 = severe fatigue. Participants also reported high fatigue scores in terms of the degree, severity and distress caused by fatigue. Pain reported by respondents (although high) was slightly lower than overall fatigue and overall anxiety slightly less. Table 3 demonstrates the extent to which fatigue interfered with daily activities for people with FMS. It can be seen that fatigue had a major impact on all daily activities with household chores and work most affected by fatigue.

**TABLE 1** Demographic characteristics.

| | *n* | (%) |
|---|---|---|
| Gender | | |
| Male | 14 | (13.3) |
| Female | 91 | (86.7) |
| Age (mean, yrs) (range) | 53.1 | (26–70) |
| Time since diagnosis (mean yrs, SD) | 8.9 | (5.2) |
| Time with pain (mean yrs, SD) | 17 | (10.7) |
| Employment status | | |
| Full-time | 8 | (7.6) |
| Part-time | 13 | (12.4) |
| Home worker | 8 | (7.6) |
| Retired | 32 | (30.5) |
| Disabled | 33 | (31.4) |
| Unemployed | 10 | (9.5) |

**TABLE 2** Impact of fatigue and pain.

| Domain | Mean | (SD) |
|---|---|---|
| GFI (1 = no fatigue, 50 = severe fatigue) | 40.7 | (6.6) |
| Degree of fatigue[a] | 8.5 | (1.5) |
| Severity of fatigue[a] | 8.4 | (1.4) |
| Distress caused by fatigue[a] | 8.0 | (2.1) |
| Pain[a] | 7.9 | (1.8) |
| Anxiety[a] | 6.7 | (2.6) |

[a]Scale 0–10.

### 4.2 | Relationship between fatigue, pain, and anxiety

When relationships between variables were examined, it was found that there were strong, significant relationships between fatigue and pain ($p = 0.001$; $r = 0.665$; Figure 1) and fatigue and anxiety ($p = 0.001$; $r = 0.583$; Figure 2). The higher respondents MAF-GFI, the more pain and anxiety they experienced in the previous week. There was no relationship between fatigue and time since diagnosis. Those diagnosed more recently with FMS were just as likely to experience significant fatigue as those who had FMS for many years (Figure 3). Interestingly, there was also a significant relationship between anxiety and pain experienced in the past week ($p = 0.001$; $r = 0.580$; Figure 4). When the relationship between work status and fatigue was explored Figure 5 demonstrates that for those in employment, either part time or full time, their overall fatigue was much less than those who were unemployed, retired, described themselves as disabled, or were home workers. Although the results did not demonstrate a significant relationship between work status and fatigue ($p = 0.169$), this is worth further exploration.

TABLE 3 Extent to which fatigue interferes with daily activities (0 = not at all, 10 = a great deal).

| MAF scale activity | Mean | (SD) |
|---|---|---|
| Household chores | 7.6 | (1.9) |
| Cook | 6.8 | (2.2) |
| Bathe or wash | 6.0 | (2.8) |
| Dress | 5.9 | (2.6) |
| Work | 7.6 | (2.9) |
| Visit or socialise with friends or family | 7.2 | (2.4) |
| Engage in sexual activity | 7.0 | (3.0) |
| Engage in leisure activities | 7.2 | (2.8) |
| Shop | 6.9 | (2.5) |
| Walk | 6.8 | (2.5) |
| Exercise, other than walking | 7.2 | (3.0) |

Abbreviation: MAF, Multi-dimensional Assessment of Fatigue Scale.

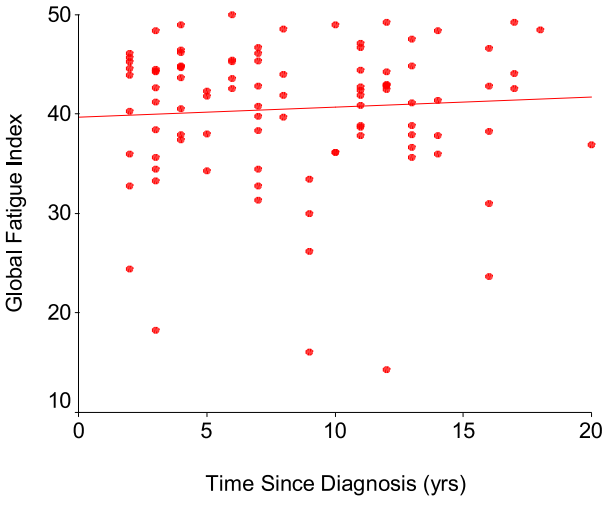


FIGURE 1 Global fatigue index vs time since diagnosis.

## 5 | DISCUSSION

The aim of this study was to determine the severity and the impact of fatigue on QoL of people with FMS and secondly, to identify the activities that are most limited by FMS. Finally, this study aimed to explore the relationship between fatigue and pain and anxiety in those with FMS. This survey demonstrated that fatigue has a major impact on the lives of those with FMS and that fatigue was associated

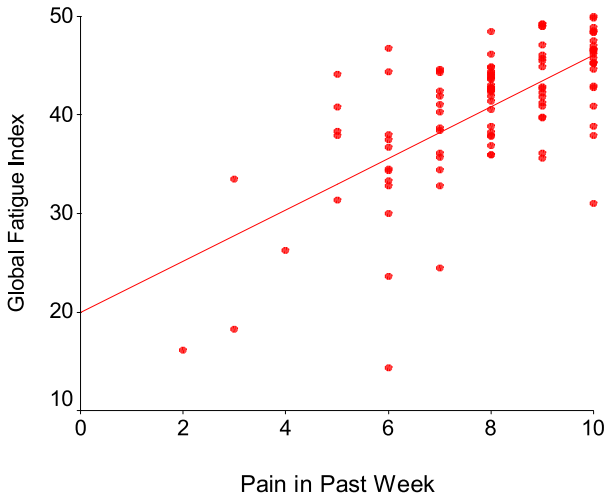


FIGURE 2 Global fatigue index vs pain in past weeks.

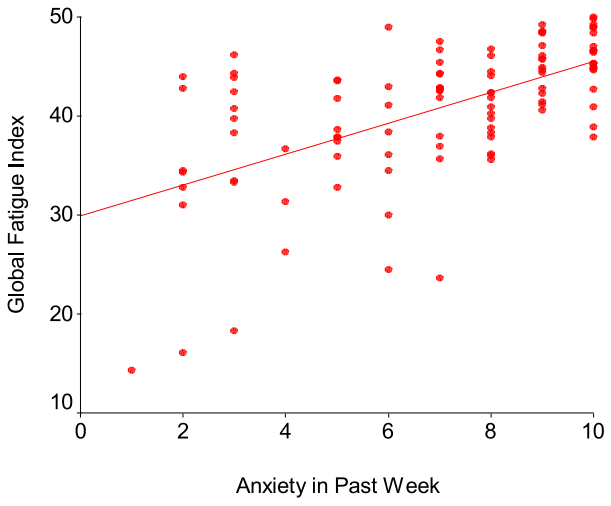


FIGURE 3 Global fatigue index vs Anxiety in past weeks.

with pain and anxiety, but there was no relationship between fatigue and the time since diagnosis. The negative impact of on the QoL of those with the condition is well recognized (Verbunt et al., 2008) and this survey supports previous findings; however, this study adds the extent of the impact fatigue has on QoL. Belza (1995) reported that patients with rheumatoid arthritis had a mean MAF-GFI of 29.2; in this survey, patients with had a mean MAF-GFI of 40.7; fatigue is clearly a major issue for those with FMS, at least as significant as fatigue in rheumatoid arthritis. Oncü et al. (2013) compared the impact of fatigue on various components of QoL in patients with rheumatoid arthritis ($n$ = 44) and FMS ($n$ = 45). These authors reported that fatigue severity, as measured by the Fatigue Impact Scale, was similar in both conditions, but that fatigue had a greater impact on cognitive function in FMS (mean ± SD; 28.8 ± 19.9) than rheumatoid arthritis (19.9 ± 8.6 $p < 0.05$), and fatigue had a higher impact on the physical component in rheumatoid arthritis (26.3 ± 4.9) versus FMS (16.2 ± 3.1). Previous work has reported that fatigue is associated with pain and depression in rheumatoid arthritis (Pollard et al., 2006) and the findings of this survey show that the same is true in FMS.

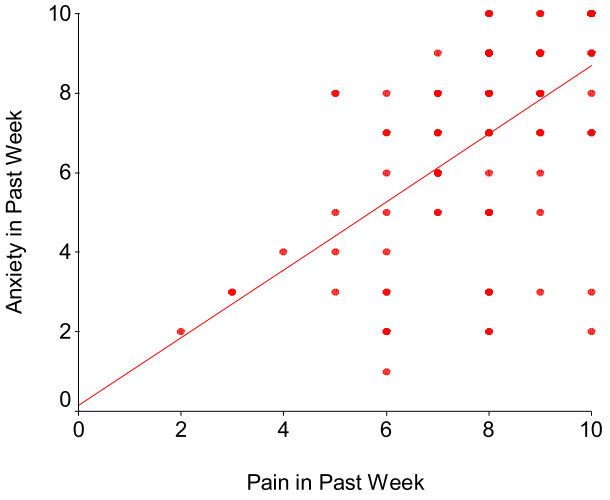


FIGURE 4 Anxiety in past week vs pain in past weeks.

Although research on the impact of fatigue on QoL and ADL's in FMS is limited, this study has demonstrated that fatigue severely affects people with FMS and has a major impact on a broad range of daily activities. Reporting similar findings in a large epidemiological study of patients with FMS in Spain ($n$ = 325), Collado et al. (2014) reported that 44% of the patients reported that they were fairly or totally dependent on a family member for household chores. Interestingly, Collado et al. (2014) reported in their sample 34% of participants were working in comparison to 21% in our study and that 23% of those in the Spanish study were in receipt of disability pension whereas 31% in the current study described themselves as disabled.

Non-pharmacological interventions play a major role in the management of FMS, which is broadly accepted by people with FMS (McVeigh et al., 2003). Häuser et al. (2010) in a systematic review and meta-analysis of 28 randomised controlled trials reported that aerobic exercise significantly reduced fatigue in FMS ($p$ = 0.009)

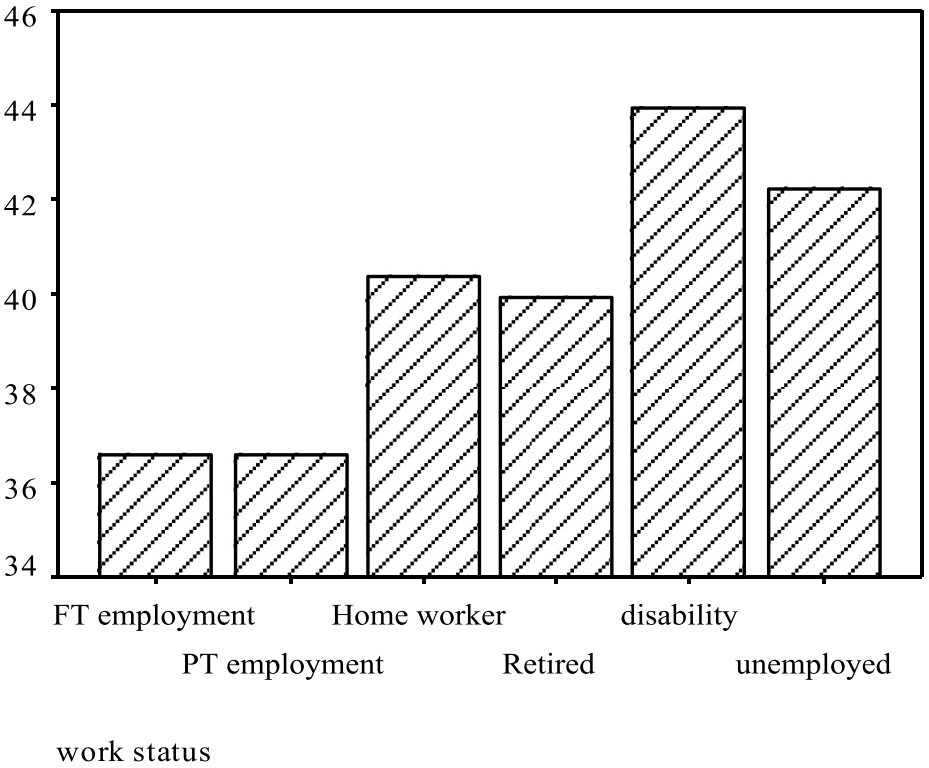


FIGURE 5 Mean GFI in one week in separate employment categories.

although the effect size was small (−0.22). However, Estévez-López et al. (2021) recently reported in a systematic review and meta-analysis of the effectiveness of exercise in the management of fatigue in FMS (36 RCTs) that none of the included studies used fatigue as the primary outcome; therefore, it is possible that studies to date examining the effect of aerobic exercise are underpowered to detect changes in fatigue. Future research should investigate the management of fatigue in FMS using fatigue as the primary outcome and the study should be powered accordingly.

While this survey demonstrated that fatigue has a major impact on the QoL of those with FMS, it should be remembered that the number of participants included was relatively small, although a response rate of 52% should give a relatively representative sample.

## 6 | CONCLUSION

This self-reported survey among people with FMS has demonstrated that fatigue is a major issue for those with FMS, both in terms of severity and impact. Few studies focus on fatigue as a primary outcome (Estévez-López et al. (2021); however, given the extent of the impact of fatigue, it is recommended that fatigue management should be prioritised along with pain management in FMS.

### AUTHOR CONTRIBUTION

Development of concept, ethics application and data collection Martin McToal, Joseph G. McVeigh. Literature review, interpretation of data and discussion Martin McToal, Rachel Christina McVeigh, Joseph G. McVeigh. Final approval of manuscript Martin McToal, Rachel Christina McVeigh, Joseph G. McVeigh.

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### CONFLICT OF INTEREST STATEMENT

All authors declare no conflict of interest.

### DATA AVAILABILITY STATEMENT

Data are available from the corresponding author.

### ETHICS STATEMENT

Ethical approval was granted from Ulster University's research ethics committee.

### ORCID

*Joseph G. McVeigh* https://orcid.org/0000-0003-0789-1419

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