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RESEARCH ARTICLE

Exploring the cognitive processes of both Arabic and English-speaking patients when completing the brief pain inventory: A qualitative study

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Abstract

Background: Brief Pain Inventory (BPI) is one of the most commonly used self-initiated questionnaire for people with chronic pain. Although the questionnaire has been translated into multiple different languages and tested for its inter-tester reliability, no study has currently explored the differences in interpretation of this questionnaire between non-English speakers as compared to English-speakers.

Purpose: Using the Arabic-language group as the comparator, this study explored the interpretation of the English and Arabic language Brief Pain Inventory (BPI) among participants living with chronic neuromusculoskeletal pain from Arabic- and English-speaking backgrounds.

Methods: This qualitative study utilises the Think Aloud method to explore the differences in the interpretation of the BPI between two language groups. Consecutive consenting adults attending a tertiary pain clinic for management of a chronic neuromusculoskeletal pain condition and self-identifying with a native English-speaking ($n = 15$) or Arabic-speaking ($n = 15$) background were included. Structured interviews using the think-aloud method were conducted, audio-recorded and analysed using coding and thematic analysis.

Results: Interpretation errors across three or more questions were recorded for all Arabic-speaking participants and two English-speaking participants. Three themes characterised appraisals of pain and interpretation of the BPI across the two cohorts: 1) pain constancy vs. variability, 2) the ability-disability spectrum and 3) variance in expression of pain.

Conclusion: Cross-cultural differences in the appraisal of pain influenced participants' interpretation of the BPI. The cultural influences on conceptualisation of pain need to be considered when using the BPI across different cultures.

KEYWORDS

Arabic-speaking, brief pain inventory, chronic pain, culturally and linguistically diverse, patient-reported outcome measure

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1 | INTRODUCTION

Chronic pain is the leading cause of disability worldwide, affecting one in five adults in Australia (Deloitte Access Economics, 2019). The subjective and multifaceted nature of pain complicates management, requiring individualised assessment and a holistic understanding of the various contributors to the pain experience (Glajchen, 2001). While the biopsychosocial paradigm recognises the biological, psychological and social dimensions of chronic pain (Beverly et al., 2016), the role of culture within this paradigm is not well operationalised (Shaw et al., 2009). Research is increasingly recognising that ethnoculture influences interpretation, experience, and management of chronic pain (Brady et al., 2017). Specifically, culturally and linguistically diverse (CALD) communities are reported to hold unique explanatory frameworks for conceptualising pain that influence behaviour, preferences for management and their interactions with healthcare providers (Brady et al., 2017; Scheermesser et al., 2021). Recognising and responding to ethnocultural differences in the appraisal of pain is important for minimising the inequitable burden of pain amongst diverse communities (Bates et al., 1993).

Standardised patient-reported measures are commonly used to objectively assess a patient's perception of pain across multiple dimensions. One such measure is the Brief Pain Inventory (BPI), a widely utilised questionnaire that assesses both pain severity and interference among people with cancer (Cleeland & Ryan, 1994). While the English-version questionnaire has reported moderate to good reliability and validity amongst people with chronic pain (Keller et al., 2004; Mendoza et al., 2006; Tan et al., 2004; Williams et al., 2006), there is limited data available on the psychometric properties of the 50 available translations within this population (Hassett et al., 2020). The Arabic version of the BPI has also been previously assessed for its psychometric properties, but the study involved validation with people with cancer from Lebanese-speaking backgrounds (Ballout et al., 2011). Specifically in the area of chronic pain, four of the available translations (Persian, Chinese, Turkish and German) have data informing the BPI's psychometric properties and reported varied results (Budnick et al., 2016; Celik et al., 2017; Majedi et al., 2017; Song et al., 2016). This raises important questions about the clinical application of this questionnaire in culturally diverse contexts, where multiple translations may be utilised in a single setting and scores utilised to inform service outcomes. Thus, further research is needed to understand cross-cultural interpretations of self-reported pain measures such as the BPI.

This study sought to understand cross-cultural interpretations of pain by exploring cognitive processes during the completion of the BPI between two different language cohorts (English and Arabic) attending a chronic pain service at a local tertiary hospital. Patients attending this service must have a diagnosis of chronic pain as a result of conditions such as osteoarthritis and non-specific low back pain. Arabic was selected as a comparator language as it is the third most common language spoken in Australia (Australian Bureau of Statistics (ABS), 2016), the sixth most spoken language in the world

(Central Intelligence Agency, 2020), and the most common language after English spoken at the study location.

2 | METHODS

2.1 | Study design

Qualitative methods involved structured interviews using the think-aloud (TA) method to investigate the interpretation of BPI between two cohorts of participants—a native Arabic-speaking and English-speaking. Constructivist-interpretivist epistemology within a relativist ontological position was adopted because it considers that different views of reality exist, that reality is continually constructed from individual experiences and interactions with others and shaped by social and cultural circumstances within one's environment (Schwandt, TA, 1994). The TA method was considered to be the most congruent with this objective (Giorgi, 1995). Ethics approval was provided by the South Western Sydney Local Health District (SWSLHD) Human Research Ethics Committee (2020/ETH00782). The study was reported in accordance with the COREQ guidelines.

2.2 | Participants and procedure

Consecutive patients attending a tertiary pain service in South Western Sydney, Australia between June 2020 and June 2021 were screened for eligibility by clinic staff and approached for participation. The COVID-19 pandemic and subsequent suspension of clinic activities lengthened the anticipated recruitment time. Eligible participants were adults (≥ 18 years) diagnosed with chronic neuromusculoskeletal pain, who could read and comprehend the BPI in either Arabic or English and self-identified as a first-generation member of an Arabic- or English-speaking culture. Patients were excluded if they were illiterate, had impaired cognition or were diagnosed with a non-neuromusculoskeletal pain condition. Interested and eligible participants were contacted by the research team to obtain written informed consent in the participant's preferred language. All consenting participants subsequently participated in a researcher-administered demographic survey and a structured in-person or telephone interview, according to the pandemic restrictions.

2.3 | Qualitative interviews

Interviews using the TA method were conducted with participants as they completed the licenced version of BPI in either English or Arabic. Permission was sought from The University of Texas MD Anderson Cancer Centre to utilise the validated versions of the English and Arabic BPI. The TA method is a valid and reliable method for exploring an individual's cognitions in response to a stimulus and has been previously used to evaluate interpretations of questionnaires (Boeije & Janssens, 2004; Darker & French, 2009; French &

Hevey, 2008; McCorry et al., 2013; Westerman et al., 2008). During the interviews, participants were given explicit instructions to “pretend as though you are talking to yourself” and to “verbalise your thoughts as much as possible”, whilst completing the BPI. Standardised prompts such as “can you please elaborate” and “please remember to think out loud”, were given to participants who remained silent for over 10 seconds. Additional prompts could be utilised to encourage participant elaboration as needed, including “could you tell me what that means to you” and “could you tell me why you have selected that response”. Extensive probing and questioning were avoided for the initial series of interviews ($n = 10$) to reduce the interference with the participants' ongoing flow of thoughts (Fonteyn et al., 1993). However, as the analysis progressed, additional prompts were added, guided by the concurrent data analysis. To ensure that participants were provided with sufficient time to verbalise their thoughts, no time limit was specified for the interview. The entire interview process was piloted with two patients to ensure that the instructions about the TA process were easily understood by patients from both English- and Arabic-speaking backgrounds.

Before completion of the interview, participants practised the TA process with the researcher using an alternate questionnaire (The EuroQol-Five Dimensions-3 level questionnaire or the Pain Catastrophizing Scale). The interviews were conducted by a member of the research team (GP, BB or MM), digitally audio-recorded and transcribed verbatim by a member of the research team (GP, BB or MM). A nationally accredited interpreter was engaged for Arabic language interviews and the English language content was subsequently transcribed for analysis. Prior to conducting the interview, the participants had not met the researchers and did not have a patient-health professional relationship with them.

2.4 | Data analysis

A sample of 10 participants per language was initially estimated to be necessary based on previous qualitative research conducted with CALD communities in South West Sydney (Brady et al., 2017). However, the final sample was determined by concurrent analysis of the interview data and team consensus that saturation of themes surrounding the primary aim was achieved.

Qualitative data were analysed using two methods: coding and thematic. For the coding analysis, transcribed interviews were segmented according to the question of the BPI to which they related and examined alongside the completed questionnaire. An established coding framework was adopted and applied by coders working independently (GP, BB or MM) (French et al., 2007). Participant responses were coded as yes/no responses (0 = no; 1 = yes) according to the following criteria: (1) participants re-read the question, misread the question or experienced problems answering the question; (2) participants questioned the appropriateness of the question or identified a problem with how the question was worded; and (3) participants answered a different question from one that was asked or gave reasoning inconsistent with the answer given. All transcripts were

double-coded, compared, and inconsistencies resolved via consensus with an independent researcher (CT). Data were pooled to yield the total number of problems experienced for each question and the total number of problems experienced overall for each questionnaire.

Independent of the coding analysis, transcripts were analysed inductively using thematic analysis (Braun et al., 2022). Double coding was performed using NVivo (QSR International Pty Ltd 2020) for all transcripts with all members of the research team participating in the analysis.

2.5 | Positionality of researchers

At the time of the study, two members of the research team were experienced qualitative researchers with expertise in cross-cultural research with PhD (BB and CT), one member was a final-year physiotherapy student who was completing this study as part of her Honours degree (GP), and one member was an experienced musculoskeletal physiotherapist (MM). Only CT self-identified as an immigrant from Singapore who is fluent in English and Mandarin. Both researchers (BB and CT) have experience working with Arabic-speaking participants in qualitative research. None of the researchers spoke Arabic or shared the same religious affiliations with the participants for this study.

3 | RESULTS

Overall, 31 participants consented to participate with 30 completing the qualitative interview ($n = 15$ for each cohort). One of the participant's interviews could not be included as a corrupted interview file made it impossible for the recording to be analysed. All participants in the English-speaking group were Australian-born and all but one, identified exclusively with an Anglo-Australian culture. Within the Arabic-speaking cohort, participants were born in four different countries and identified as being part of one of three ethnocultural communities (Table 1). Participants of both groups had similar demographic and pain characteristics, except for the duration of pain, which was 10.2 years longer amongst English speakers compared to Arabic speakers (95% CI 3.4–16.9, $p = 0.005$) (Table 1).

3.1 | Coding analysis

Results of the coding analysis are presented in Table 2. Arabic-speaking participants experienced greater difficulty interpreting the BPI as compared to the English-speaking participants. Out of the 11 questions, all Arabic-speaking participants encountered difficulties with at least three of the questions. In comparison, only two of the English-speaking participants had difficulties with at least three of the questions.

Marked differences in coding results between the two cohorts were observed for the Pain Severity subscale. Nine Arabic-speaking

TABLE 1 Participant characteristics.

Participant	Cohort	Age	Sex (F/M)	Country of birth	Years in Australia	Self-identified culture	Highest level of education	Employment status	Duration of pain (years)
E1	English	55	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	10
E2	English	51	M	Australia	N/A	Australian	Secondary school	Unemployed other health reasons	15
E3	English	43	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	10
E4	English	29	F	Australia	N/A	Australian	Secondary school	Full-time paid	6
E5	English	64	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	40
E6	English	64	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	22
E7	English	54	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	20
E8	English	55	M	Australia	N/A	Australian	University bachelor or diploma	Unemployed due to pain	30
E9	English	52	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	30
E10	English	50	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	10
E11	English	47	M	Australia	N/A	Australian Lebanese	Secondary school	Unemployed due to pain	8
E12	English	51	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	10
E13	English	52	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	20
E14	English	41	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	20
E15	English	67	F	Australia	N/A	Australian	Secondary school	Unemployed due to pain	43
A1	Arabic	57	M	Syria	2	Arab	Secondary school	Unemployed due to pain	7
A2	Arabic	47	F	Syria	3	Arab	Secondary school	Unemployed due to pain	15
A3	Arabic	45	F	Iraq	10	Mandaean	Secondary school	Unemployed due to pain	5
A4	Arabic	33	M	Iraq	7	Mandaean	Secondary school	Unemployed due to pain	13
A5	Arabic	55	F	Iraq	3	Mandaean	Secondary school	Unemployed due to pain	15
A6	Arabic	44	F	Iraq	11	Mandaean	Secondary school	Home duties	10
A7	Arabic	41	M	Iraq	4	Mandaean	University bachelor or diploma	Part-time paid	11
A8	Arabic	45	F	Iraq	23	Chaldean	Secondary school	Part-time paid	5
A9	Arabic	54	F	Ghana	30	Arab	Secondary school	Unemployed due to pain	7
A10	Arabic	52	M	Syria	5	Arab	Secondary school	Unemployed due to pain	10
A11	Arabic	52	F	Iraq	15	Chaldean	Secondary school	Unemployed due to pain	15

TABLE 1 (Continued)

Participant	Cohort	Age	Sex (F/M)	Country of birth	Years in Australia	Self-identified culture	Highest level of education	Employment status	Duration of pain (years)
A12	Arabic	51	F	Syria	11	Chaldean	University bachelor or diploma	Unemployed due to pain	3
A13	Arabic	39	M	Syria	5	Mandaean	Secondary school	Part-time paid	2
A14	Arabic	53	F	Egypt	16	Arab	Secondary school	Unemployed due to pain	4
A15	Arabic	58	F	Syria	7	Mandaean	Secondary school	Unemployed due to pain	4

Abbreviations: F, female; M, male; N/A, not applicable.

TABLE 2 Summary of coding analysis results by each subscale.

BPI subscales	Problems encountered	Number of responses with problems/total number of responses (%)	
		English-speaking	Arabic-speaking
Pain severity	Reading/answering the questions.	7/40 (17.5)	15/40 (37.5)
	Believed questions were inappropriate/worded incorrectly.	1/40 (2.5)	3/40 (7.5)
	Answered a different question from one that was asked, or gave reasoning inconsistent with the answer given	1/40 (2.5)	17/40 (42.5)
Pain interference	Reading/answering the questions	1/70 (1.43)	13/70 (18.57)
	Believed questions were inappropriate/worded incorrectly	0/70 (0)	0/70 (0)
	Answered a different question from one that was asked, or gave reasoning inconsistent with the answer given	6/70 (8.57)	9/40 (12.86)

and two English-speaking participants had difficulty reading or answering two or more questions in the BPI. Similarly, a greater number of Arabic-speaking participants (12/15) experienced interpretation errors and/or inconsistent responses compared with English-speaking participants (3/16). The most common item in the Pain Severity scale incurs errors related to 'average pain intensity'. Confusing wording for this item was reported by three Arabic-speaking participants and one English-speaking participant, while interpretation errors or inconsistent responses were observed for 11/15 Arabic-speaking participants and none of the English-speaking participants. Arabic participants often described 'average' as "most of the time". Few errors were present for reading and answering the remaining Pain Severity items, with only one Arabic-speaking participant reporting confusing wording for the question related to pain intensity 'right now'.

For the Pain Interference subscale, only five Arabic-speaking participants experienced difficulty reading or answering two or more questions in the BPI. Interpretation or reasoning errors were present for eight Arabic speakers and three English speakers. Among Arabic-speaking participants, errors included the misinterpretation of 0–10 anchors ("Sorry, I think I misunderstood the rating number. I didn't see this, I got confused" A14) and general difficulty comprehending the instructions ("As I told you, I read it but I can't understand what is required from me" A11). Further, the Arabic translation for 'interference' was

also a source of confusion and misinterpretation. Specifically, nine Arabic-speaking participants interpreted the word for 'interference' as 'disability' (A11) and this may have contributed to higher values for the interference sub-scales recorded in Table 2 for this cohort.

3.2 | Thematic analysis

Thematic analysis identified three major themes that characterised participants' interpretation of the BPI items. This included (1) Pain constancy versus variability, (2) The ability-disability spectrum, and (3) Variation in the expression of pain. A detailed description is provided below with quotes coded according to cohort, with 'A' referring to the Arabic-speaking and 'E' referring to the English-speaking.

3.2.1 | Theme 1—Pain constancy versus variability

Two distinct reasoning processes emerged from Pain Severity item appraisal: an emphasis on constancy or an emphasis on the temporal behaviour of the pain (variability). Only Arabic-speaking participants reflected on the constancy of pain in their interpretation of pain severity items, with almost half (7/15) using this reference to frame their responses: "The pain is there 24 h, I always have the pain" (A15).

This reasoning underpinned the choice of a consistently high response (9 or 10) to all four items (worst, least, average and now) as one participant reflected “I answer the same because (it's the) same question. Number five it tell(s) me about the time 24 h... All the time (pain) about the 24 h” (A3).

The reference to the constancy of pain was particularly evident when answering Question 5 (‘average pain in the last 24 h’) and may have contributed to the high number of interpretation errors recorded for this item, as discussed in the coding analysis. Specifically, an interpretation of ‘average’ as ‘most of the time’ directed Arabic-speaking participants to focus on the frequency with which they felt pain and subsequently frame their responses against its constancy: “Because it's not sometimes or most of the times, it's all the time.” (A5).

In contrast, participants who reflected on the temporal behaviour of the pain, rather than its constancy, more commonly selected a range of responses for Pain Severity items, reflecting that “... it's (pain scores) been a little bit higher but that would be at the end of the night and the last 24 h, when I've pushed to do some housework... 7 would be consistently the worst it's been for the whole day.... Five would be the least.” (E13). References to temporal variability were present in all English-speaking interviews and half of the Arabic interviews, despite most participants reporting constant symptoms.

3.2.2 | Theme 2—Ability-disability appraisal

All participants interpreted Pain Interference items against an external reference of what they perceived to be ‘normal’. In doing so, marked differences between the two cohorts emerged, with the Arabic-speaking participants communicating greater incompatibility between pain and physical, psychological and social functioning. Arabic-speaking participants appraised Pain Interference items through a dichotomous lens, wherein the presence of pain was a “disability” itself, regardless of the activities one could do “with pain”:

I feel that I have a disability. It's really a disability. I am not able to live my life like normal. (A15; General Activity 10/10).

Three of the English-speaking participants also approached Pain Interference items through a dichotomous lens, with the presence of pain being the primary determinant of the value selected rather than the specific activities they could/could not do

I would say maybe number seven. Because when I walked for a long time with the swelling that I've got on my back. My back tends to get very uncomfortable. (E11, walking ability 7/10)

Importantly, tangential thought processes and/or high levels of emotion were evident amongst the three English-speaking participants who interpreted Pain Interference items through a dichotomous lens, potentially accounting for this interpretation:

horrible, all the time. I try. I do try, but I cry a lot, I'm on antidepressants and I'm on everything else (crying) (E14, mood 9/10).

When pain was interpreted through such a disability lens, the rating of interference assigned was characterised according to the presence of pain with activity rather than an appraisal of the ability to complete specific activities:

I give it number 9 (general work) because anything I do, it causes pain. I get strong pain immediately that stops me from completing whatever task I've started (A7; work 9/10)

In contrast, English-speaking participants were more likely to appraise pain interference against a spectrum of interference, focussing equally on aspects they could do, alongside those they had difficulty with

this (pain) really interferes with that (ability to work)... like an 8 I would say. Um, I can do a little bit of vacuuming with a light vacuum. There is lots of things like weeding and that need to be done, or I can fold clothes, but I can't hang them... (E13, work 8/10).

3.2.3 | Theme 3: Variance in the expression of pain

There appeared to be a distinct difference in expression of pain between the two cohorts, with English-speaking participants rationalising their scores by reflecting on both positives and negatives, while Arabic-speaking participants adopted a negativity bias “The pain is very bad, I can't even breathe because of the pain” (A5, worst pain 10/10), consistent with a lens that pain is incompatible with function:

So this is asking me about enjoying life. I don't have any goals. 10... so going out, socialising... that is having a normal life. But because I don't have all of that (A14, Enjoyment of life 10/10).

The expression of pain was not just reflected in the numerical response selected but also in the participant's non-verbal communications during the interview. Crying and pauses due to difficult emotions throughout the interviews were more commonly observed among Arabic-speaking participants (6/15) as compared to English-speaking participants (2/16). In particular, a tone of despair was adopted when responding to the items related to ‘enjoyment of life and mood’ items, with participants desiring to communicate “I don't enjoy life because of the pain” (A10 10/10), “if you have pain in the body, you have bad mood” (A3 8/10) and “there is no enjoyment of life as long as there is pain” (A8, 10/10).

Overall, the responses selected by Arabic-speaking participants appeared to align with messages they desired to communicate to the

healthcare team rather than a direct response to the question. In most cases, this was influenced by a desire to communicate the magnitude of the problem:

I feel that all my body is stopping me from doing anything... I am not able to walk at all... walking to the hospital, okay, I walk a bit, I rest a bit, I can walk no longer than 7 minutes (A5, walking 10/10).

Some Arabic-speaking participants reported hesitation in responding to the questionnaire items, concerned by how they may be perceived by their healthcare team: *"The pain is greater, but I chose number 7 so that it doesn't seem like I am exaggerating. Even though the real scale is higher, I preferred to put 7"* (A11).

Subtle contextual differences emerged between the two cohorts while responding to questionnaire items surrounding what it means to live with chronic pain. A need to fulfil a societal role was more commonly expressed and given greater weighting among Arabic-speaking participants compared to English-speaking participants. Inability to perform these roles often cascaded their sense of despair and negative perception of pain.

unable to do all the housework and can't do the driving ... can't pick up my children (Participant A8, Arabic-speaking)

Broadly speaking, English-speaking participants were more likely to reference a desire to do activities that achieved personal reward such as *"go for a walk with the dog"* (P13) or *"martial arts"* (P8), rather than those for social or family benefit.

Finally, inherent within participants' responses was an interpretation of what constituted pain management. Over a third of English-speaking participants (6/15) interviewed regarded management of their pain rather than pain elimination as a goal, while only one Arabic-speaking participant expressed this perspective:

Not in pain that would be lovely. But that's not going to happen, I don't think so at this age.... Just manage it as best I can. That is all I can do. (Participant E6)

Rather, an orientation towards symptom or disability resolution was greater amongst Arabic-speaking participants, and this may have influenced the way they expressed pain within their responses.

4 | DISCUSSION

This study sought to understand the cognitions associated with the completion of a commonly used pain assessment between two different cohorts experiencing chronic pain. Despite the use of the previously validated Arabic-version of the BPI (Ballout et al., 2011), cross-cultural differences in the understanding of, and responses to, items assessing both pain severity and pain interference were found,

with a greater number of errors or inconsistencies in responses recorded for the Arabic cohort. Further, thematic analysis of verbalised cognitions suggested that there were cultural influences on how participants appraised their pain experience and subsequently responded to the questionnaire. Combined, these findings suggest a need for caution when utilising different language versions of a given questionnaire and the consideration that the same tool may yield different meanings across cultures.

The observation of different approaches to pain severity interpretations across participants has been previously reported (Booker & Herr, 2015). In an integrative review of self-reported pain assessments for CALD adults, Booker and Herr (2015) highlight the influence culture may have on the orientation of questionnaire items. Specifically, while horizontal rating scales and ratings between 0 and 10 are common in Western cultures, differences in orientation, references, or axis' for expressing pain may vary across cultures (e.g. vertical axis in Chinese culture) and contribute to misinterpretation among diverse respondents. Indeed, the Arabic-speaking participants in our study experienced greater difficulty interpreting the numerical scale compared with English-speaking participants. Similarly, research utilising anchor-based scales may also need to consider the choice of anchor descriptors such as *"pain as bad as you can imagine"* and the cultural differences in the interpretation that may accompany their use (Yokobe et al., 2014).

Previous research has argued for a need for caution when utilising questionnaires developed for Western populations with non-Western cultures (Booker & Herr, 2015; De Silva et al., 2019). In a qualitative focus group study of CALD participants living with low back pain, De Silva et al., 2019 observed cultural attitudes towards pain and work influenced participants' responses when using two commonly used pain questionnaires (Fear Avoidance Beliefs questionnaire and Orebro Musculoskeletal Pain Questionnaire). Similarly, our findings show participants from CALD backgrounds did not respond with references to pain alone. Their responses reflected their context of living with pain and an additional aim of emphasising their concerns to their healthcare team. Communication intent was a key consideration by Arabic-speaking participants who recognised the questionnaire to be a tool used by healthcare providers to appraise their pain and/or their necessity for treatment. For some participants, this appeared to frame a communication of the magnitude of the pain problem, while for others, a concern for being labelled as exaggerating influenced responses. While consideration to the communication motive should be given to all patients, it is particularly important for patients from CALD backgrounds who are known to experience a greater degree of underestimation of their pain and biases by their healthcare providers (Green et al., 2003; Hall et al., 2015). Adopting a culturally responsive approach to the interpretation of patient responses may help to avoid communication misinterpretations and promote equity in the management of pain for diverse communities.

An additional consideration emerging from the research is the importance of utilising questionnaires that have been cross-culturally adapted and validated for a specific target cohort. While the Arabic

BPI used in this study has been psychologically and linguistically validated in cancer populations (MD Anderson Cancer Center, 2017; Nejmi et al., 2010), participants in our study with chronic neuromusculoskeletal pain who were from diverse Arabic-speaking cultures experienced difficulty interpreting and completing the BPI. It is unclear from our study whether dialectical or cultural differences contributed to our participants' difficulty in responding to the Arabic BPI. As a result, similar to previous research (Nusbaum et al., 2001), our findings suggest there is a need to explore a questionnaire linguistic and cultural validity. Without considering the cultural responsiveness of questionnaires, responses are potentially misinterpreted (Booker & Herr, 2015) and could have unintended consequences for clinical decision-making (Fillingim, 2017).

While this study adds to the body of research understanding cross-cultural influences on pain assessments, its limitations must be acknowledged. The use of an Arabic-speaking interpreter for interviews, rather than conducting interviews in-language, may have disrupted participants' thought processes and the depth of responses obtained from Arabic-speaking participants. Additionally, the absence of a member of the research team who identifies to be from the same cultural group as the participant may have limited the cultural specific perspective that could be brought into the analysis. Future research should consider the use of a bilingual pain researcher to assist with the data collection and analysis process. Secondly, our findings relate only to those cultures/communities included in this study and may not be reflective of Arabic-speaking or English-speaking communities with different cultural identifications or countries of birth. Thirdly, participants in this study were not provided with the opportunity to check the summary of their interview because of inability to translate the English summary into Arabic for Arabic-speaking participants. Nonetheless, the additional step to perform both coding and thematic analysis aimed to strengthen the rigour of the study by allowing a triangulation of themes with coding analysis. Despite these limitations, our study provides insight into an individual's cognitive process during questionnaire completion and raises important considerations not only for Arabic-speaking communities but also for CALD communities more broadly.

5 | CONCLUSION

Cross-cultural differences in the appraisal of pain influenced participants' interpretation of the BPI. Clinicians should acknowledge these differences and consider a culturally appropriate approach when administering the BPI to people from ethno-diversified backgrounds.

AUTHOR CONTRIBUTION

All authors contributed to the study design. GP, BB and MM undertook recruitment and data collection. All authors contributed to the analysis of the results and writing of the manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors report that there are no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available within the article and its' supplementary materials.

ETHICS STATEMENT

Ethics approval was provided by the South Western Sydney Local Health District (SWSLHD) Human Research Ethics Committee (2020/ETH00782) and all participants provided informed consent.

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