



BMJ Open Experiences of general practitioners explaining central sensitisation to patients with persistent physical symptoms: a focus group study

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ABSTRACT

Objective Patients with persistent physical symptoms (PPS) require an explanation that is acceptable and comprehensible to them. Central sensitisation (CS) is an explanatory model for PPS and chronic pain that has been broadly applied in the context of pain medicine, but, until recently, not by general practitioners (GPs). We explored how GPs used the CS model in their consultations with patients with PPS.

Design and setting A qualitative focus group study among GPs in the Netherlands.

Methods We instructed 33 GPs on how to explain CS to patients with PPS. After 0.5–1.5 years of using the CS model, 26 GPs participated in focus groups and interviews to report and discuss their experiences with CS as an explanatory model. Audio recordings were transcribed and two researchers independently analysed the data. The text was coded, codes were organised into themes and discussed until consensus was reached.

Results We identified eleven themes and grouped these into four categories.

The GPs regarded the CS model as evidence-based, credible and giving recognition to the patient. On the other hand, they found explaining the CS model difficult and time-consuming. They tailored the CS model to their patients' needs and used multiple consultations to explain the model. The GPs reported that the use of the CS model seemed to improve the understanding and acceptance of the symptoms by the patients and seemed to reduce their need for more diagnostic tests. Furthermore, patients seemed to become more motivated to accept appropriate therapy.

Conclusion GPs reported that they were able to provide explanations with the CS model to their patients with PPS. They regarded the model as evidence-based, credible and giving recognition to the patient, but explaining it difficult and time-consuming.

INTRODUCTION

Persistent physical symptoms (PPS) are challenging for both doctors and patients.^{1–3} Doctors are anxious to overlook somatic pathology and struggle with the complexity of the management of PPS.³ Patients often travel a long diagnostic path via many medical

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study is the first one analysing the experiences of general practitioners (GPs) explaining the central sensitisation model to patients with persistent physical symptoms.
- ⇒ Our training, consisting of a short introduction of 1 hour and a toolbox for self-study, fitted well in the busy work schedule of the GPs.
- ⇒ We did not interview patients; the reported patients' experiences are interpretations of the GPs.

specialists, hoping that a well-defined medical disease will be found that explains their symptoms.

PPS are symptoms that last at least a few weeks, go along with maladaptive cognitions, emotions and/or behaviours and cause impaired functioning and/or suffering. The symptoms can occur in the presence of a known (adequately treated) disease or in the absence of one. Until recently, the unexplained character of the symptoms was emphasised and therefore the symptoms were named functional symptoms or medically unexplained symptoms. However, in the last few years there is a consensus that persisting physical symptoms is a more appropriate term.⁴ In this paper, we will use the term PPS.

In case of absence of a known disease, the unexplained nature and lack of acknowledgment may exacerbate the symptoms.⁵ Patients frequently experience severe functional limitations.⁶ Both direct and indirect costs have been found to be high in patients with PPS.^{5,7,8} Despite the existence of management guidelines for PPS, it takes a long time, often up to 2 years, for doctors and/or patients to accept that the symptoms are persistent.^{9,10} PPS is mainly treated by addressing the perpetuating factors, based on the biopsychosocial model.^{9–11}

Doctors may use diagnostic tests to reassure patients, but research has shown that normal test results do not reassure many patients with PPS.¹² Patients who do not receive a definite medical diagnosis feel rejected, dissatisfied and believe they will not receive effective treatment. Meanwhile, their symptoms may worsen as a result of perpetuating factors, for example, anxiety about their condition, and a loss of physical fitness, activities, work and social contacts. Patients find it difficult to understand the link between their symptoms and their psychological state.¹³

Several studies have found that doctor–patient communication in consultations regarding PPS is challenging.^{3 14 15} General practitioners (GPs) and patients must find a ‘common ground’.¹ While both GPs and patients struggle with and are affected by this mismatch, a good doctor–patient relationship can be helpful to bridge the gap between the GP and the patient’s perspective.¹⁴ Validation of PPS may benefit from meaningful and acceptable explanations.^{16 17}

Central sensitisation (CS) is defined as ‘increased responsiveness of nociceptive neurons in the central nervous system to their normal or subthreshold afferent input’.¹⁸ Recent extensive research has shed light on the mechanisms of CS.^{19 20} Professionals working in the field of pain medicine, for example, physiotherapists and rehabilitation physicians, already employ the CS explanation.^{21 22} According to current findings, informing patients about the relation between symptoms and the interaction between body and brain (pain neuroscience education) can reduce worry in the near term and can lead to enhanced vitality, better physical functioning and improved mental health in the long run.^{23 24}

To explore if the CS model could be a good explanation for GPs and their patients, we investigated the experiences of GPs who used it in their explanations to patients with PPS. Furthermore, we investigated whether GPs believe that patients with PPS comprehend and accept the CS explanation for their symptoms, and hence are more motivated to seek appropriate therapy.

METHODS

Design

We performed a qualitative, prospective study among GPs from the region West-Friesland in the Netherlands. We organised focus groups with the GPs because the interaction in such groups can yield more insight into the phenomena of interest.²⁵ We complemented this with a few interviews among the GPs who could not participate in a focus group. We were interested in unravelling the experiences of the GPs, therefore we applied thematic analysis. Thematic analysis is a method for analysing data that comprises interpretation in the selection of codes and the formation of themes, as well as data description.^{26–28}

Box 1 Toolbox for the explanation of the CS model

The toolbox consisted of instruction video recordings, a written clinical lesson, theory and drawings about the CS model, information about other explanatory models and examples of metaphors.

The participants were taught to deliver the consultation in seven steps:

1. The GP has to recognise patients with PPS and start talking about their symptoms after adequate diagnostic tests and treatment.
2. The GP has to ask permission to the patient to explore their symptoms and their consequences.
3. The GP explores the symptoms with the biopsychosocial model (somatic symptoms, thoughts, emotions, behaviour, influence social surroundings, all in relation to the symptoms).
4. The GP formulates a shared problem definition. This has to be done before providing an explanation and discussing a treatment plan. A shared problem definition entails that GP and patient agree that diagnostic testing has been sufficient, that no further testing is warranted, and that it is time to focus on coping with the symptoms. If it is difficult to reach a shared definition, GP and patient should discuss what is needed getting there.
5. The GP explains with the CS model how symptoms can persist. Hereto GPs were provided with information about CS and could use provided graphs to explain it to patients or create their own illustration, for example, a vicious circle. Several metaphors were provided, such as the burglar of fire alarm metaphor: the alarm is still wailing while the burglar is already gone or the fire is out.
6. The GP discusses with the patient the possible perpetuating factors which may influence the symptoms. This discussion is founded on the exploration of the symptoms and identification of a list of possible medical, psychological and social factors that might be perpetuating the symptoms. The GP explains that the body and mind are interconnected and both can influence symptoms and tells the patient that the brain and neurons are flexible and might adapt to a new balance.
7. The GP encourages the patient to seek the proper treatment. To increase the patients’ motivation, it is essential to connect with what is important to them. Treatment should ideally target both physical and psychosocial perpetuating factors.

CS, central sensitisation; GP, general practitioner; PPS, persistent physical symptoms.

Settings

We invited a convenience sample of GPs from the region West-Friesland (North-Holland) by email. When they agreed to participate in the project, one of the investigators (CdB) visited their practices to introduce a toolbox for the explanation of the CS model (box 1). This meeting lasted 1 hour. The GPs had to familiarise themselves with the explanation with CS by reading a clinical lesson and written information and watching instruction videos. (Psychosomatic) physiotherapists from their regions, mental health nurse practitioners and residents, were also invited to the meeting. To avoid confusing the patients by using different terms, all health professionals involved in the care for a patient were instructed to use identical terms in explaining CS to a patient.

The participants worked with the toolbox for 0.5–1.5 years, as they entered the study at different time points. The researcher regularly sent emails to enhance the

motivation of the participants. Meanwhile, three GPs participated in a more extensive course on patients with PPS provided by the vocational training department for GPs of Amsterdam UMC.

Inclusion of the participants

We invited GPs to participate in our study between March 2018 and March 2019. We had no specific inclusion or exclusion criteria. The GPs had to apply the model to their patients with PPS and were invited to participate in the focus groups or interviews by telephone at the end of the study. Researcher CdB invited all GPs who attended an annual regional training, to participate in March 2018. Several GPs began applying the model shortly after, while we recruited more participating GPs throughout the year. Therefore, the GPs who entered in the beginning of 2019 had less time to practice applying the model. In the region West-Friesland, many GPs are also GP trainers and these were more enthusiastic to participate. As a result, the participants comprised 17 GP trainers. The GPs did not receive a participation award; they got the toolbox and support of the researcher (CdB).

Data sampling

In August and September 2019 we evaluated the experiences of the GPs. We organised focus groups (F) and for GPs who were not able to attend these, we held individual interviews by phone (P). An independent and experienced GP moderated the focus groups. A medical student (SvE) attended the focus groups and interviewed the GPs by telephone. Each focus group lasted about 90 min.

The focus groups and individual interviews were guided by a topic list (online supplemental appendix 1). The main subjects of the topic list were:

1. Experiences of GPs with providing an explanation to patients with PPS before receiving the training.
2. Experiences with explaining the CS model to patients.
3. Reactions of patients to the explanation of the CS model.
4. Benefits and drawbacks of using CS as explanation model for PPS.

Data analysis

The focus groups and interviews were audio-recorded and transcribed verbatim. Qualitative analysis was performed using Atlas.ti V.8.0, a software program for analysing qualitative data.

Two researchers, CdB and SvE (medical student) analysed the data from the two focus groups and the interviews by telephone. They analysed the transcripts thematically.²⁶ The main aim of this analysis is to categorise responses by theme and explore similarities and differences between GPs. The number of codes per theme also indicates the theme's importance.

Both researchers familiarised themselves with the data by reading the transcripts. Then they started coding the relevant elements independently, compared the codes and discussed these in consensus meetings. Consecutively,

they grouped codes referring to the same subject into categories and the categories were grouped into themes to identify key factors of GPs' experiences with the explanation of CS. They reviewed and renamed the themes and made the final report. They chose to connect the identified themes to the topics of the topic list, to get a logical order of the results.

The two researchers always reached a consensus, so it was not necessary to involve a third one. They analysed the transcripts of the focus groups and the interviews in the same manner.

RESULTS

In total, 33 GPs agreed to participate in our study. Their practices had different forms: a health centre with 8 GPs, and practices with 1–4 GPs; 17 GPs were also GP trainers.

We conducted two focus groups with the GPs, one with 5 and the other with 10 GPs. Ten GPs were interviewed by telephone. All 15 participants in the focus groups applied the model. Two of the ten GPs who were interviewed by telephone did not apply the model, they reported in their interviews that they did not use the model because they found the model too complex or preferred to use their own explanation model.

Eight participants dropped out of the study, they had not applied the CS model for practical reasons, such as moving abroad, illness, retirement, lack of time or lack of patients with PPS. They did not participate in the focus groups or interviews (table 1).

Analysis of the focus groups and interviews with the GPs

We identified 11 themes and divided them among the 4 topics of the topic list. Table 2 summarises the 4 topics in combination with the 11 themes and the number of codes per theme.

Topic 1: GPs' previous experiences with (explanation to) patients with PPS

Theme 1: previous approaches to patients with PPS

GPs reported that they have to be convinced that the symptoms are PPS to provide a persuading explanation to the patient. The base of the explanation is recognition of the symptoms and taking these very seriously. They stressed that it is important to show empathy and to coach the patient well. Sometimes they explained to the patient that the symptoms would not disappear, but the patient

Table 1 Participants of the study (n=33)

GPs starting intervention	Number	Application of model
Participating in focus groups	15	15
Participating in interviews	10	8
Dropped out (eg, movement abroad, illness, retirement)	8	0
GP, general practitioner.		

Table 2 Topics from the topic list, themes from the analysis and number of codes per theme

Topics from the topic list and themes from the analysis	Number of codes
Topic 1: GPs' previous experiences with (explanation to) patients with PPS	
Theme 1: previous approaches to patients with PPS	25
Theme 2: previous experiences with explanations	28
Theme 3: relationship with patients with PPS	18
Topic 2: GPs' experiences with explanation of the CS model	
Theme 4: putting the CS model into practice	89
Theme 5: conditions for use of the CS model	71
Theme 6: use of metaphors	17
Topic 3: patients' responses to the explanation of the CS model	
Theme 7: reactions of patients	52
Theme 8: benefits of the CS model for the patients	20
Topic 4: benefits and drawbacks of the CS model	
Theme 9: benefits of the CS model for the GPs	68
Theme 10: drawbacks of the CS model for the GPs	63
Theme 11: collaboration with other disciplines	30

CS, central sensitisation; GP, general practitioner; PPS, persistent physical symptoms.

can learn to experience less burden. GPs also explained that it can be normal to have symptoms due to acquired or innate vulnerabilities.

GP P3 (P: Phone interview): Then I often talk to people about the dual-track policy. What I regularly do is, for example, do an exploratory lab, and also have them fill out a 4DSQ. And then in the second meeting, I explain the lab results to the people and I give back the 4DSQ results, and that generally already leads to some preference or direction. And if people then go along and let go of the somatic track, then I'm pleased, then we're going in the right direction, but if people have difficulty letting go of the somatic track or have some objection, then the conversation can become a bit more difficult.

GP F6 (F: focus group): Sometimes I explain that one person has more headaches, another has regular back pain; you have certain vulnerabilities that are part of you. You are the way you are.

Theme 2: previous experiences with the explanation of PPS

Prior to the training, GPs struggled to explain PPS to their patients because they lacked the necessary tools

and knowledge, and they frequently did not provide any explanation. They referred the patients to a variety of medical specialists to rule out a somatic disease, which was frustrating for both the GP and the patient. Some GPs used metaphors like a broken alarm system or they used sentences like 'stress leads to increased muscular tension' and 'disturbance of the balance between strength and vulnerability' to explain their findings.

GP F2: At least there's nothing serious going on, you really don't need to worry. Absolutely no reason to', that's the kind of thing I would say.

GP F6: And he has a physical problem, he had a shoulder luxation at a young age, a long time ago, 10 years ago. But between then and now he has seen 5 different orthopaedists, pain specialists, neurologists, everything, I don't know how many physiotherapists and rehabilitation treatment. And it never gets better so to speak; the findings of the examinations in themselves are good but he has many, many symptoms.

Theme 3: relationship with patients with PPS

GPs acknowledged that their sympathies for patients with PPS differed from patient to patient and day to day. In consultations with patients with PPS, whether they liked the patient or not seemed to matter more than in consultations with patients with clear-cut somatic problems.

GP F2: I like it when it's a nice person. So I can take a lot if I have a soft spot for the person in some way. And the next one, pfffff.

Topic 2: GPs' experiences with explanation of the CS model

Theme 4: putting the model into practice

Some patients found the term 'central sensitisation' too difficult to understand, so GPs used terminology like 'hypersensitivity' instead. They tried to tailor the CS model to their patients' needs, taking time to explain to them over several appointments. They emphasised that you must be convinced of the model in order to explain it to patients. Even though GPs were often aware that the symptoms were consistent with PPS, they continued to refer patients for additional diagnostic tests in order to gain the patient's trust and, in some cases, to address their own insecurity. Patients with modest symptoms may accept the explanation more readily than those with more severe symptoms.

GP P5: Anyway, you have something to offer, and if people are willing to engage with it and that makes things more bearable, I'd say that's a health gain.

GP F14: It's very complete and it also provides clear steps; for example, I thought the problem definition was very enlightening. What we were talking about earlier, that you agree that this is hypersensitivity of the nervous system. I thought it was helpful that you need to clarify this first, and only then start explaining the rest of that vicious circle.

GP F1: With the tools we were given you no longer feel so powerless. With those few metaphors I feel I can handle 80 percent. And that clip of the trainer talking about the symptoms; you just have those symptoms. Of course people often think that they shouldn't have any symptoms. No, she says it very well, so I think those clips are very helpful as an example of how to adopt the attitude of empathy, and then try to steer them towards, well the symptoms won't disappear, but how can you go on from there?

Theme 5: conditions for use of the CS model

GPs believed that some health literacy of the patient was required to understand the explanation of the CS model, but they found that they could explain the model to patients with low intelligence as well. Some GPs were hesitant to explain the model to patients with long lasting symptoms, while others did so in that case. Furthermore, GPs emphasised that the patient must first be sufficiently reassured, and that the GP–patient relation must be good. They deemed the CS model appropriate for patients of all ages, although cultural differences and language barriers made explanation more complicated.

GP F3: They have to be able to understand it and summon the energy.

GP F4: You have to have a good relationship with them.

GP F3: You have to be able to convince them that you really think this is something that could help.

Theme 6: use of metaphors

Metaphors, especially the alarm system metaphor and the burglary metaphor, were thought to be quite useful to explain CS. GPs used metaphors to encourage the patient to stop unnecessary diagnostic research and to start the proper treatment. Some patients were not able to understand metaphors, and drawings on those cases might be helpful.

GP P3: I use it especially for chronic pain and in that context I like the burglary metaphor. So how often do I use it? I think I use the burglary metaphor a few times a year.

GP F1: The tank and the light, that was a good one too. They often recognize it, that the petrol light comes on, you fill up the tank and you drive away, and the light comes on again. That with the wiring, that you have to look higher up, I think, yes that's a recognizable explanation for many people.

Topic 3: patients' responses to the explanation of the CS model

Theme 7: reactions of patients

Most patients understood the CS model, according to GPs, and accepted that it might explain their symptoms' persistence. Furthermore, GPs reported that the patients were taken very seriously and were more motivated to receive adequate treatment. The models' scientific foundation helped to convince the patient and gave the confidence to the patient to stop

further diagnostic testing and start working on the symptoms. The use of the same explanation model and language by physiotherapists and mental health nurse practitioners participating in the patients' care was beneficial.

GP F6: You can explain how things developed, what we think the mechanism is, and then perhaps we can investigate whether you can live with it a bit more easily, so it doesn't bother you as much. And that appealed to him, and he came back, he wasn't negative, he agreed with the referral to the psychosomatic physiotherapist, so.

GP F12: It definitely gives the patient something to hold on to if she is always trying to figure out 'what on earth is wrong with me'. And there is a useful, kind of explanation, even though it's a complicated one, that also convinces the doctor. Then it does kind of give the patient confirmation.

GPs mentioned that some patients interpreted the explanation as if something was wrong in the central nervous system, thus creating another 'disease'.

GP F3: The tricky thing is, that if you say there's something wrong with the wiring, the inhibitory wiring, it doesn't function as it should, but it can get better, that you still call it a kind of illness. 'O, so I have faulty wiring, so something *is* wrong'. That's what people may think, now we're talking about it, I think that's a difficult one.

GP P4: To make the connection from the brain level, so to speak, to what people feel, I find that quite difficult; and then people sometimes think 'it's in my head after all', because then they start talking about 'my head' or 'my brain'.

Theme 8: benefits of explanation with the CS model for the patients

GPs mentioned that the results of the explanation for the patient only can be judged over a longer period, symptoms might be reduced at first but could return after some time. But their first experiences were positive, patients seemed to understand the explanation and sometimes this was already enough for the patient to cope with the symptoms. Some patients accepted that their symptoms could not be explained by a specific medical disease and stopped their search for a medical diagnosis.

GP F12: No, but there was one time when I said, then this is what we'll do. And then I invited the man back at the end, and we were having a good conversation, and then we were both like, well we'll just let this go for now.

Topic 4: benefits and drawbacks of explanation with the CS model

Theme 9: benefits of the model for the GPs

Most GPs were satisfied with the CS model, they reported that the model provided more insight into the mechanisms



underlying PPS and provided them with useful tools for explaining the patient where their symptoms came from. They were convinced of the scientific underpinning of the model.

GP F10: This model really does give depth. People have had symptoms for five years and then you start working with this model and new things come up, as well as maintaining factors, like how is it possible that people remain stuck in that state. So it does provide more insight into the patient. And that's why they feel taken seriously.

GP F6: Just the fact that you yourself are now thinking to some extent, yes it's simply a substrate, that is actually convenient. That you can rely on it, that you don't have to think what on earth is it, except of course that you always have to remain alert to the fact that there could be something else going on. Just, there is an explanation and we can work with it, simple in some cases and complicated in others. Or sometimes not even work with it, but 'this is it and can't explain it'.

GP F6: But as such, I have used the drawing thing, that we did during the course, several times, illustrating, explaining it. We bought the book; you can copy several pages from it and demonstrate things to people, so definitely that. And I feel, it feels like, people need something to hold on to. Either a diagnosis, or a name, they want to be able to explain it somehow, or understand to some degree what's happening. And you can actually explain things in a very graphic way that they are able to comprehend.

Theme 10: drawbacks of the model

GPs were afraid that they might overlook somatic pathology, which has no direct bearing on using the CS model. When the GP had explained that CS was causing the symptoms that the patients was experiencing and afterward a (rare) disease was diagnosed, the GP might feel embarrassed and failing.

GP F1: So the experience at that time, it shook me that we all just couldn't find it and it were dramatic neurological symptoms and she died, at 62 or something. So that inhibits you a little, to dare to go down that path.

Other reported disadvantages of the model were its complexity and the time it takes to explain the model. GPs needed more training in explaining CS. In one of the focus groups three GP trainers had attended an extended course of 4 days and they were very happy with the skills they had developed in that course. The term sensitisation is a difficult word that is not easy to pronounce. Also, GPs were very busy and found it sometimes difficult to find the time.

GP F12: : But the thing is that it's hard, apart from the model being complicated, to get it accepted by the other person once you've explained it. After the

initial glassy stare, you explain again, oh wait a minute, it needs to sink in. You should talk about it a few more times before someone really accepts it, that this is really about them, that's what I think.

GP F7: I think it is just because we are not used to it, I think, that every time I start without preparation, I just don't succeed. What I should do, like you say, is make a plan beforehand, like, I will explain this, in this way, and then it works. If I haven't prepared it, if it just comes up, I can't do it very well. Not enough time, or I start to stammer.

Theme 11: collaboration with other disciplines

In order to speak the same language to the patients, (psychosomatic) physiotherapists and mental health nurse practitioners were invited for the meeting at the start of the project. GPs reported that the collaboration with these professionals improved mostly and they stressed that this collaboration is very important in the treatment of the patients. Some GPs experienced difficulties when collaborating with professionals who lacked knowledge of the CS model. It was considered important to speak the same language to avoid confusing the patient.

GP P4: I am very satisfied with the psychosomatic physiotherapists who work in this region. We've agreed to speak the same language, so that people are told one thing, otherwise it can get confusing. And that generally works well.

GP P1: And I have to say, the psychosomatic physiotherapist we refer patients to, it doesn't click with all the patients. I often get the feedback, 'that was so vague, I'm not going back there'.

DISCUSSION

We investigated the experiences of GPs with applying the CS model to patients with PPS. GPs emphasised that in order to explain it to patients, one must be convinced of the rationale of the CS model. GPs regarded the CS model as evidence-based, convincing and giving recognition to the patient; they also found it complex and time-consuming. They tailored the CS model to their patients' needs and used several consultations to explain the model. GPs thought that it had a positive effect on patients: they reported that the patients had more understanding and acceptance of the symptoms after receiving and discussing the explanation. Furthermore, they reported that the patients were more motivated to seek proper treatment.

Comparison with existing literature

PPS is recognised by GPs early during the consultation: after on average 4 min for newly presented symptoms, and after on average 2 min for previously presented symptoms.²⁹⁻³¹ Eikelboom *et al* discovered that 91.2% of initially diagnosed patients and 99.5% of cases in follow-up studies were correctly classified with functional somatic

symptoms.³² Despite early recognition and a minimal risk of missing a serious disease, GPs find it challenging to label symptoms as PPS, and to steer patients toward the right treatment.

Explanations should be focused, practical and in the patient's language, according to the guidelines.^{17 33} Even experienced GPs have a limited set of explanatory models at their disposal.³⁴ Burton *et al* provide six criteria for a rational explanation: the explanation must be plausible, not imply blame or weakness, promote therapeutic collaboration, apply a descriptive label, address causation and be created through dialogue.³⁵ den Boeft *et al* found four dialogue types in consultations with patients with PPS: lecture, storytelling, contest and deliberation; cocreated explanations can be seen as a fifth type and are the most likely to be accepted.³⁶

Few studies and guidelines have focused on the explanation of CS by GPs. Morton *et al* analysed 138 consultations with explanations of five GPs working in the Symptoms Clinic in Sheffield. The Symptoms Clinic Intervention consists of one long and three moderate-length consultations. They identified three categories of explanation components: facts, mechanisms and causes. Furthermore, they identified seven categories of mechanisms in the explanations: somatic mechanisms, sensitisation, exhaustion, dissociation, alarm, attention and avoidance. In 93.5% of the explanations mechanisms were mentioned, most commonly (neuro)physiological mechanisms as sensitisation (40.6%), somatic mechanisms (39.1%) and exhaustion (21%). Cognitive mechanisms were also mentioned: attention (21.7%) and avoidance (13.8%).³⁷

In a systematic review, Leaviss *et al* showed that interventions for PPS delivered by GPs were not effective, but patients valued receiving an explanation for their symptoms and techniques for self-management. As in our study, GPs reported a need for training, although they did report that they thought patients found the help of the GPs appropriate and helpful.³⁸

A focus group study with Dutch GPs showed that GPs faced difficulties in explaining the symptoms during their consultations.³ GPs used three approaches for explanation: normalisation of symptoms, telling the patients that there is no disease and using metaphors. The first two approaches might be less effective and might lead to more use of healthcare.^{33 39} Metaphors might be clarifying and exculpating, but their effectiveness is limited.³⁶ The authors concluded that GPs seem to lack the competence to apply the available models adequately.³ In our study GPs reported that before use of the CS model they did not have tools for explanation and mostly referred the patients to medical specialists and used simple metaphors as the broken alarm system.

Terpstra *et al* explored consultations of GPs with patients with PPS in the Netherlands. GPs provided explanations in almost all consultations, these were communicated as a possibility and in a patient-specific way. They did not use more detailed explanations, only a few GPs used the

sensitisation model.³⁴ In our study, very few GPs had used CS as explanatory model before receiving the training.

In 2018, the WONCA Working Party on Mental Health provided guidance for GPs in the management of PPS.⁴⁰ Patients and GPs have to create explanations together in order to 'build up a common understanding on how these symptoms develop within explanation models that are culturally acceptable, especially when the biological links between problems, emotions and symptoms are clarified'. Sensitisation is one of the seven models which were given as examples.

Strengths and limitations

We consider it a strength that the recordings showed a safe atmosphere in the focus groups and a vivid discussion between the participants. Most participants knew each other because they work in the same region and 10 GPs were GP trainers at the same university. Hence, we assume that they have openly shared their experiences.

Ten GPs participated in the interviews by telephone. They talked with an independent researcher, a medical student, and these interviews had also a safe atmosphere.

Participation in focus groups gives broader information, because opinions can build on each other and the dynamic of the group generates new ideas.²⁵ On the other hand, individual interviews might have provided more detailed information and depth.⁴¹ We found no differences in the experiences of GPs participating in the focus groups or interviews.

We transcribed the verbatims meticulously and performed a thematic analysis with two researchers. We had a limited number of disagreements and we think the results are clear and adequately illustrated with the quotes of the GPs.

We did not interview the patients, but we asked the GPs about their opinions about the patients. Therefore, we cannot confirm the interpretations given by the GPs and their memories might be biased. We chose not to interview the patients in this study because we wanted to focus on evaluation of the training and the experiences of the GPs. Patients' experiences will be addressed in our next study.

Twenty-five GPs participated in the study for more than a year; eight GPs participated for 6 months. We do not assume this had a substantial influence on the results because, given the prevalence of patients with PPS in general practice, 6 months is enough time to get familiar with explaining the model.

Implications for practice

PPS are challenging for both GPs and patients; management of it requires mutual trust and time. GPs and patients have to talk about and discuss the symptoms in order to find a mutual agreement. In our study, the explanation with the CS model seemed to be comprehensible and acceptable for the patient according to the GPs and offered opportunities for appropriate treatment. Our short training was sufficient; most GPs were able to apply



the model with the training and the toolbox. However, more extensive training with more exercise might have made the explanation easier for the GPs. Moreover, the effects for patients should be studied using an appropriate study design and follow-up period.

Multidisciplinary collaboration is essential in treating patients with PPS. A regional network with mental health-care nurse practitioners, (psychosomatic) physiotherapists and psychologists with knowledge of the treatment of patients with PPS is necessary. When all caregivers are using the same explanation model, patients might be more convinced and less confused. Physiotherapists and rehabilitation physicians sometimes already use the CS model; this might be an advantage for further implementation.

CONCLUSIONS

In our study, the GPs reported that they were able to explain CS to patients with PPS. The GPs regarded the CS model as evidence-based, credible and giving recognition to the patient. The GPs reported that the model offered the patients more understanding and acceptance and motivated them to start an appropriate treatment of the symptoms. The scientific underpinning of the model made it convincing for both GP and patient. It took time and exercise to get familiar with the model and to perform it well.

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Appendix 1: Topic list for the focus groups and interviews by telephone

1. Experiences with patients with PPS and explanations to patients with PPS. What goes right in the treatment of patients with PPS, and which obstacles do you face?
Do you know of forehand how the treatment will develop?
What explanation models do you use in the conversation with patients with PPS?
2. Experiences with central sensitisation as explanation model for PPS
How often did you apply this model to patients with PPS? How was this with patients you already know for a long time? To which patients did you use PPS with the model of central sensitization and to which patients rather not? What's going well with the explanation of central sensitisation to patients with PPS, and which obstacles do you face?
3. Reactions from patients to this explanation model. How do patients react to this explanation of central sensitization? Do they understand and accept the model? Why yes and why not? Are there differences between types of patients? To which patients it does not work? Are there differences between patients with higher education and patients from lower social-economic classes? How broad is this model applicable and how do you adapt the model? Does this model reassure more than other models, e.g. do the patients ask less for more diagnostics? Does this model contribute to a better motivation for treatment of their symptoms?
4. Benefits and drawbacks of the model of central sensitisation compared to other explanation models. What are the success factors of central sensitisation as an explanation model compared to other models, what are the drawbacks and possible improvements? What other experiences did you have applying the model? Do you keep using it, and why yes or no? What were your experiences with the training and the provided materials?