

LETTERS TO THE EDITOR

ChatGPT's accuracy and patient-oriented answers about fibromyalgia

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Dear Editor,

Fibromyalgia (FM) is a complex syndrome characterized by widespread pain, accompanied by sleep disturbances, asthenia, “fibro fog”, catastrophizing thoughts, among other symptoms. The peculiarity of its pain is settled on the nociplastic trait – a distinctive feature of central sensitization. On this ground, and following the bolstering of pain precision medicine, the International Association for the Study of Pain has created nociplastic pain criteria, providing advantages that have been discussed¹.

Health literacy is an invaluable tool on disease management, more so when concerning pain syndromes as FM². In this regard, and upholding current technology advances, patients increasingly rely on the internet as a source of information. Artificial intelligence (AI) detains the capacity to handle a vast amount of data, analyze complex processes and predict patterns, which might theoretically be of use in Medicine. ChatGPT (Generative Pre-trained Transformer) is a natural language processing (NLP) model developed by OpenAI³, which fabricates human-like text in a chatbot conduct. It has already proved useful for answering medical student examination questions⁴ and writing basic medical reports⁵, although some raise concerns about its viewpoint on question understanding and response depth⁶.

Since ChatGPT might yield an innovate means to present reliable and accurate health information for patients, and according to FM's major prevalence and the need for better education, we designed a study to evaluate its responses for the questions available at the Portuguese Society of Rheumatology's (SPR) website, in the patient's section. On June 25, 2023, we asked ChatGPT 6 questions about FM's basic characterization, including symptoms, diagnosis, treatment, prognosis, and prevention. The only previous prompt was to reply in Portuguese from Portugal. Both SPR's and ChatGPT's answers to these questions were blinded, and then evaluated by 4 rheumatologists with scientific knowledge and expertise on this disease. These rheumatologists

had 1, 2, 13 and 35 working years of clinical practice. For each question, they were asked to choose the preferable answer (SPR's, ChatGPT's or neither), and to rate each answer (6 from SPR and 6 from ChatGPT), in a dichotomous manner (yes/no), for: a) accuracy, and b) patient-oriented language. This task was not compensated. Interrater agreement was evaluated by Fleiss κ . Statistical analysis was performed using SPSSv28.

Overall, reviewers picked ChatGPT's answers 15 times, SPR's 6 times, and were equally inclined to either one 3 times. ChatGPT's answers were evaluated as accurate 23 times, while SPR's were 17 times. Language-wise, ChatGPT's answers were interpreted as patient-friendly 22 times, and SPR's 23 times. Only question 1, regarding what fibromyalgia is, had an answer (ChatGPT's) that was preferable for all reviewers (100% agreement) [$\kappa=0.854$ (95%CI 0.721-0.902)], with other answers being more dissonant [$\kappa=0.121$ (95%CI -0.132-0.375)]. Likewise, 5/6 of ChatGPT's answers were rated accurate by all reviewers (except question 4 regarding FM's diagnosis, in which 1/4 reviewers found it inaccurate) [$\kappa=0.621$ (95%CI 0.421-0.698)]; only 2/6 SPR's answers also had 100% agreement among reviewers, concerning accuracy [$\kappa=0.100$ (95%CI 0.131-0.331)]. Four out of 6 ChatGPT's answers were found to be patient-friendly by all reviewers [$\kappa=0.421$ (95%CI 0.311-0.0.755)], while 5/6 SPR's answers endorsed that agreement [$\kappa=0.599$ (95%CI 0.424-0.722)]. Table 1 displays all questions and the performance of the ChatGPT's and SPR's answers, including word count and Flesch-Kincaid readability grade level for each individual answer. The Flesch-Kincaid readability grade, first developed in 1975⁷, is a measure of how easy it is to comprehend a text, which relies on sentence length, word difficulty and text cohesion, through a mathematical formula. The result ranges from 0 to 18, and the higher the more difficult to read. All the answers are available in the Supplementary Data 1 document. In this regard, ChatGPT's answers were wordier, but similarly readable as SPR's (except for question 1, which was harder for ChatGPT's answer, and question 4, harder for SPR's). Chiefly, these results hint that ChatGPT's output grants accurate information about FM, without providing harmful data.

Nowadays, search engine results may prove overwhelming, mixing misleading information with truly

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Submitted: 28/11/2023

Accepted: 15/01/2024

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TABLE I. Performance of the ChatGPT's and SPR's answers to FM questions

Question	ChatGPT answer				SPR answer				Reviewer's preferred answer
	Accuracy, yes	Patient-oriented language, yes	Word count	FKG	Accuracy, yes	Patient-oriented language, yes	Word count	FKG	
1- What is fibromyalgia?	100%	100%	203	16.7	50%	100%	79	13.7	ChatGPT (100%)
2- What causes fibromyalgia?	100%	75%	265	13.8	75%	100%	72	15.6	ChatGPT (75%), SPR (25%)
3- What are the complaints/symptoms of fibromyalgia?	100%	100%	278	11.7	100%	100%	164	12.0	ChatGPT (75%), neither (25%)
4- How is fibromyalgia diagnosed?	75%	100%	209	13.7	50%	100%	28	17.6	ChatGPT (50%), SPR (50%)
5- How is fibromyalgia treated?	100%	75%	283	14.1	100%	100%	475	14.3	ChatGPT (25%), SPR (25%), neither (50%)
6- What consequences can fibromyalgia have?	100%	100%	328	13.5	50%	75%	40	11.8	ChatGPT (50%), SPR (50%)

FKG - Flesch-Kincaid readability grade; ChatGPT - Chat Generative Pre-trained Transformer; SPR - Sociedade Portuguesa de Reumatologia; FM - fibromyalgia; FKG - Flesch-Kincaid readability grade.

Accuracy - Whether the conveyed health knowledge adheres to medical reasoning and established scientific evidence, principles and standards.

scientific knowledge, some with confusing medical verbose. ChatGPT may sort this numerous evidence into more comprehensible inputs in a conversational dialogue. Also, it is free of use, something that is important as financial struggling is associated with poor health outcomes⁶. Nonetheless, AI does not replace critical thinking, it bears no real-world experience, and cannot displace health professionals' expertise. Moreover, it relies on the internet, so it may hypothetically replicate stereotypes or other biases; yet health professionals might also have some stereotypes regarding FM. Likewise, its answers might only present rephrased or modified versions of SPR's. Concerning this, some reluctance persists in the matter of repeated questioning resulting in outputs with semantic modifications that could harvest misinformation. Hence, ChatGPT needs to be seen as an adjunct tool for patients rather than a physician's replacement, especially since it might experience difficulties with ambiguous/complex questions. Furthermore, as ChatGPT only extends its knowledge until 2021, it might be scientifically outdated in some aspects. Additionally, unless otherwise specified in the prompt, it may not respect the patient's local/country guidelines.

Our study, while limited by the unique use of the Portuguese language, the small sample size (possibly lacking statistical power) and the simplistic evaluation of the answers (yes/no) for its content complexity, boosts trust in ChatGPT usage as a source of reliable information for

FM patients. As patients and health professionals alike start compounding experiences with AI, and issues with trust and credibility of AI-generated chat responses are raised, the needed research will inevitably arise, further corroborating (or not) our study results.

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SUPPLEMENTARY MATERIAL

As to avoid linguistic/semantic disarrangements inherent to translation, all questions and answers are in Portuguese, which was the language that both ChatGPT and the reviewers worked on. These answers were blinded for the reviewers. A translated version to English was added in the end of this document.

1 - O QUE É A FIBROMIALGIA?

Which answer is preferable? 1 ___ 2 ___ Neither ___

Answer 1 (SPR) - A fibromialgia é uma doença que se caracteriza por dor músculo-esquelética generalizada, difusa, muitas vezes migratória e por um aumento da sensibilidade a uma variedade de estímulos que podem causar dor e desconforto, como o esforço, stress ou os ruídos. Afeta cerca de 2-4% dos adultos, sendo mais frequente em mulheres. Pode ter períodos de acalmia ou exacerbação, sendo que a dor e desconforto podem ser flutuantes. Acompanha-se frequentemente de fadiga, alteração do sono, problemas de memória e concentração.

- Is it accurate? Yes ___ No ___
- Is the language patient-friendly? Yes ___ No ___

Answer 2 (ChatGPT) - A fibromialgia é um problema crónico de saúde que causa dor generalizada e sensibilidade em todo o corpo. É considerada uma síndrome, pois envolve uma combinação de sintomas, incluindo dor muscular, fadiga, distúrbios do sono e problemas de humor. Embora a causa exata da fibromialgia ainda não seja totalmente compreendida, acredita-se que envolva uma combinação de fatores genéticos, físicos e emocionais. Os sintomas da fibromialgia podem variar de pessoa para pessoa, mas a dor generalizada e sensibilidade nos músculos, tendões e articulações são características comuns. Além disso, os indivíduos com fibromialgia muitas vezes experimentam fadiga extrema, distúrbios do sono (como insónia ou sono não reparador), dificuldades cognitivas (conhecidas como “névoa mental”), ansiedade, depressão e dores de cabeça. Embora não haja cura para a fibromialgia, o tratamento visa aliviar os sintomas e melhorar a qualidade de vida. Isso pode envolver uma abordagem multidisciplinar, incluindo medicamentos para alívio da dor, terapia física, terapia ocupacional, terapia cognitivo-comportamental e técnicas de *coping* de stress. Os apoios emocional e educacional também desempenham um papel importante no controlo da doença. É importante procurar orientação médica se apresentar sintomas consistentes com a fibromialgia, pois um profissional de saúde poderá fazer um diagnóstico adequado e elaborar um plano de tratamento personalizado.

- Is it accurate? Yes ___ No ___
- Is the language patient-friendly? Yes ___ No ___

2 - QUAL A CAUSA DA FIBROMIALGIA?

Which answer is preferable? 1 ___ 2 ___ Neither ___

Answer 1 (SPR) - A origem e causa da fibromialgia não são muito claras. Pensa-se que existe um aumento da sensibilidade à dor, devido a alterações dos neurotransmissores e do processamento da dor, tanto a nível do sistema nervoso periférico como do sistema nervoso central, que conduz a situações de hipersensibilidade a estímulos externos. O stress psicológico (preocupação, ansiedade) favorece este mecanismo, além de aumentar também a tensão que se transmite aos músculos, aumentando a dor.

- Is it accurate? Yes ___ No ___
- Is the language patient-friendly? Yes ___ No ___

Answer 2 (ChatGPT) - A causa exata da fibromialgia ainda é desconhecida. No entanto, acredita-se que seja uma condição multifatorial, resultante de uma combinação de fatores genéticos, físicos e ambientais. Alguns dos principais fatores que podem desempenhar um papel no desenvolvimento da fibromialgia incluem:

- Suscetibilidade genética: Certas variantes genéticas podem aumentar a predisposição de uma pessoa para desenvolver fibromialgia. No entanto, não é uma condição herdada de forma direta.
- Alterações na resposta à dor: Pessoas com fibromialgia podem ter uma sensibilidade aumentada à dor devido a alterações na maneira como o cérebro e o sistema nervoso central processam os sinais de dor. Isso pode resultar numa amplificação das sensações dolorosas.
- Distúrbios do sono: A falta de sono reparador ou distúrbios do sono, como a síndrome da apneia do sono, podem estar associados à fibromialgia. Acredita-se que a privação do sono possa desencadear sintomas e contribuir para o desenvolvimento da doença.
- Fatores emocionais e stress: Traumas físicos ou emocionais, bem como altos níveis de stress, podem desempenhar um papel no desenvolvimento da fibromialgia. Alguns indivíduos desenvolvem fibromialgia após eventos stressantes significativos, como acidentes de carro, lesões ou doenças.
- Processos inflamatórios: Alguns estudos sugerem que a inflamação crónica pode estar envolvida na fibromialgia. No entanto, a relação exata entre inflamação e fibromialgia ainda não está clara. É importante destacar que a fibromialgia é uma doença complexa e a sua causa pode variar de pessoa para pessoa. O diagnóstico e tratamento adequados devem ser realizados por um profissional de saúde qualificado, como um médico reumatologista, que pode avaliar os sintomas e desenvolver um plano de tratamento individualizado.

- **Is it accurate?** Yes ___ No ___
- **Is the language patient-friendly?** Yes ___ No ___

3 - QUAIS AS QUEIXAS/SINTOMAS NA FIBROMIALGIA?

Which answer is preferable? 1 ___ 2 ___ Neither ___

Answer 1 (SPR) – A dor músculo-esquelética é generalizada, mal definida, imprecisa, difusa, muitas vezes migratória (salta de uns lados para os outros) e pode variar de intensidade. Pode acompanhar-se de formigueiros, sensação de adormecimento, tremor, sudorese e sensação de rigidez de articulações e músculos. A dor agrava com o frio, com alterações do sono, e em períodos de maior stress, preocupações ou angústia. Além da dor músculo-esquelética, são frequentes outros sintomas:

Alterações do padrão do sono:

- Insónia inicial (dificuldade em adormecer);
- Despertares noturnos frequentes (sono fragmentado);

Sono não reparador;

- Fadiga e cansaço matinal (“parece que fui atropelado por um camião”);
- Falta de força e vontade para realizar as tarefas diárias, cansaço intenso e sensação de esgotamento físico (mais ao final de um dia de trabalho ou exercício físico intenso);
- Diminuição da concentração, défice de memória e distração fácil;

Outras manifestações que podem estar associadas:

- Intolerância ao frio e/ou ao calor;
- Síndrome colon irritável;
- Enxaqueca ou cefaleia de tensão;
- Dores menstruais;
- Disfunção da articulação temporomandibular;
- Bexiga hiperativa;
- Depressão.

- **Is it accurate?** Yes ___ No ___
- **Is the language patient-friendly?** Yes ___ No ___

Answer 2 (ChatGPT) – Os sintomas da fibromialgia podem variar de pessoa para pessoa e podem ser persistentes ou intermitentes. Alguns dos sintomas mais comuns da fibromialgia incluem:

1. Dor generalizada: A dor é o sintoma mais característico da fibromialgia. É uma dor crónica que geralmente é descrita como uma sensação de dor difusa, generalizada por todo o corpo. A dor pode ser profunda, latejante, ou em queimação. Ela pode variar em intensidade e localização.
2. Fadiga: Muitas pessoas com fibromialgia experimentam uma sensação persistente de fadiga, mesmo após períodos de descanso adequado. A fadiga pode afetar significativamente a energia, a capacidade de concentração e a realização de atividades diárias.

3. Distúrbios do sono: Distúrbios do sono são comuns em pessoas com fibromialgia. Isso pode incluir dificuldade em adormecer, sono interrompido ou não reparador, acordar cansado e ter pesadelos frequentes.
 4. Sensibilidade ao toque: Muitas pessoas com fibromialgia têm sensibilidade aumentada ao toque. Podem sentir dor ou desconforto mesmo com o toque leve.
 5. Rigidez matinal: Algumas pessoas com fibromialgia experimentam rigidez muscular e articulações rígidas pela manhã. Esses sintomas geralmente melhoram ao longo do dia.
 6. Problemas cognitivos: Também conhecido como “nevoeiro cerebral” ou “fibrofog”, a fibromialgia pode causar dificuldade de concentração, lapsos de memória, confusão mental e dificuldade em realizar tarefas cognitivas.
 7. Sintomas emocionais: A fibromialgia está frequentemente associada a sintomas emocionais, como ansiedade, depressão, irritabilidade e alterações de humor.
- Além desses sintomas principais, a fibromialgia também pode estar associada a outros sintomas, como dor de cabeça, dor abdominal, síndrome do intestino irritável, formiguelo nas mãos e pés, sensibilidade à luz e ao som, entre outros. É importante ressaltar que o diagnóstico da fibromialgia requer uma avaliação médica adequada.
- **Is it accurate?** Yes ___ No ___
 - **Is the language patient-friendly?** Yes ___ No ___

4 - COMO SE FAZ O DIAGNÓSTICO DE FIBROMIALGIA?

Which answer is preferable? 1 ___ 2 ___ Neither ___

Answer 1 (SPR) – O diagnóstico de fibromialgia é um diagnóstico clínico de exclusão e caracteriza-se pela ausência de alterações significativas no exame físico e nos exames laboratoriais e exames de imagem.

- **Is it accurate?** Yes ___ No ___
- **Is the language patient-friendly?** Yes ___ No ___

Answer 2 (ChatGPT) – O diagnóstico da fibromialgia é baseado numa avaliação clínica detalhada, considerando os sintomas relatados pelo paciente e a exclusão de outras condições médicas que possam causar sintomas semelhantes. Não existem exames laboratoriais ou de imagem específicos para diagnosticar a fibromialgia, portanto, o diagnóstico é essencialmente clínico.

Geralmente, o médico irá realizar o diagnóstico de fibromialgia se o paciente apresentar os seguintes critérios:

1. Dor generalizada: O paciente deve relatar dor em pelo menos 4 quadrantes do corpo (lado direito e esquerdo, acima e abaixo da cintura) por um período mínimo de três meses.
2. Pontos sensíveis: O paciente deve apresentar sensibilidade à pressão em pelo menos 11 dos 18 pontos específicos conhecidos como pontos sensíveis. Esses pontos sensíveis estão localizados em áreas como pescoço, ombros, tórax, cotovelos, coxas e joelhos.

Além desses critérios, o médico também irá considerar outros sintomas comuns da fibromialgia, como fadiga, distúrbios do sono e problemas cognitivos.

Durante a avaliação, o médico irá descartar outras condições médicas que possam apresentar sintomas semelhantes, como artrite reumatoide, lúpus, doença tiroideia, entre outras. Isso pode envolver exames laboratoriais e de imagem para descartar essas doenças.

É importante ressaltar que o diagnóstico da fibromialgia pode ser desafiante, pois os sintomas podem ser subjetivos e variar de pessoa para pessoa.

- **Is it accurate?** Yes ___ No ___
- **Is the language patient-friendly?** Yes ___ No ___

5 - COMO SE TRATA A FIBROMIALGIA?

Which answer is preferable? 1 ___ 2 ___ Neither ___

Answer 1 (SPR) – Os objetivos dos tratamentos são o alívio da dor, reduzir a ansiedade, melhorar o sono e melhorar a qualidade de vida para manter uma boa atividade física, social e familiar.

Tratamento não farmacológico:

- Educação do doente: é um ponto fundamental do tratamento. O doente deve ter consciência da importância que o stress, as preocupações e a angústia têm como fatores desencadeantes e de agravamento da fibromialgia, devendo controlá-los. O doente deve-se empenhar no seu próprio tratamento.

- Relaxamento psicológico: levar uma vida mais tranquila, reduzir o stress, resolver conflitos, procura da realização pessoal, maior tolerância. Arranjar tempo para ele próprio, para descansar, relaxar, meditar. Tentar ser feliz.
- Regularização do sono: deitar-se a horas regulares, mantendo o quarto escuro e tranquilo; evitar café, chás ou tabaco ao final do dia.
- Exercício físico regular: o estado de imobilização a que muitos doentes com fibromialgia se remetem para não desencadear as dores, leva a uma deficiente condição física com redução da força e da flexibilidade dos músculos, provocando cansaço fácil.

A prática regular de exercício físico é essencial, uma vez que reduz a intensidade da dor e da fadiga, os sintomas que os doentes consideram mais incapacitantes, assim como diminui a tensão muscular, o stress e a ansiedade, facilita o sono, favorece a coordenação motora para as atividades diárias, promove uma postura adequada, ajuda no controlo do peso e, assim, melhora a autoestima e a qualidade de vida. O programa de exercício tem que ser individualizado para cada doente, dependendo da sua condição física, tendo sempre em conta as suas preferências – utilizar atividades físicas que correspondam aos gostos do doente facilita o seu empenho. Os exercícios devem ser leves, sem carga, progressivos e em pequena quantidade, mas idealmente realizados diariamente, obedecendo a uma sequência programada. Os movimentos não devem ser extenuantes. Deve-se alertar o doente que pode sentir um agravamento da intensidade das suas dores em curtos períodos, particularmente durante os primeiros dois meses de atividade física, mas que estes regridem e não devem ser razão para desistirem. Alguns exercícios recomendados são a hidroginástica em piscina aquecida, a ginástica aeróbica, o Yoga, o Tai-Chi e Pilatos.

Os programas devem incluir:

- Aquecimento: melhora o aporte sanguíneo para os músculos e tendões, adequando a frequência cardíaca e respiratória. Com isto melhora a resistência física para os exercícios e mesmo para as atividades diárias.
- Exercícios de fortalecimento muscular e alongamento: importantes para promover o equilíbrio, coordenação motora e controlo da dor.
- Exercício aeróbio (caminhada, dança, exercício aquático): importantes para o condicionamento cardiovascular e controlo de peso – frequência de pelo menos 2 dias/semana, com duração de pelo menos 20 minutos;
- Relaxamento final: alongamentos e exercícios com a respiração no final dos exercícios, que visam “desacelerar” o organismo.
- Banhos de água quente: ajudam a relaxar e a diminuir a tensão muscular e a dor.
- Psicoterapia/terapia cognitiva comportamental: pode ser muito útil em alguns doentes.
- **Is it accurate?** Yes ___ No ___
- **Is the language patient-friendly?** Yes ___ No ___

Answer 2 (ChatGPT) - O tratamento da fibromialgia é geralmente abordado de forma multidisciplinar e individualizada, com o objetivo de aliviar os sintomas, melhorar a qualidade de vida e promover o autocuidado. Não existe uma cura definitiva para a fibromialgia, mas várias abordagens terapêuticas podem ser adotadas. Aqui estão algumas opções de tratamento comumente utilizadas:

1. Educação e autocuidado: O paciente é orientado sobre a doença e a importância de adotar hábitos saudáveis, como praticar exercícios físicos de baixo impacto, manter uma rotina de sono adequada, gerir o stress e cuidar da saúde mental.
2. Medicamentos: Podem ser prescritos medicamentos para controlar os sintomas da fibromialgia, como analgésicos, antidepressivos, relaxantes musculares e medicamentos específicos para melhorar o sono.
3. Terapia física: Fisioterapia e exercícios supervisionados por um profissional de saúde podem ajudar a fortalecer os músculos, melhorar a flexibilidade, aliviar a dor e reduzir a rigidez.
4. Terapia ocupacional: Um terapeuta ocupacional pode auxiliar o doente a adaptar o seu ambiente de trabalho e atividades diárias para reduzir o impacto da fibromialgia e melhorar a funcionalidade.
5. Terapia psicológica: A terapia cognitivo-comportamental pode ser útil para ajudar o doente a desenvolver habilidades de *coping*, gerir o stress, lidar com a dor e melhorar o bem-estar emocional.
6. Tratamentos complementares: Algumas pessoas encontram alívio dos sintomas com terapias complementares, como acupuntura, massagem, técnicas de relaxamento, ioga e meditação. No entanto, é importante discutir com o médico antes de iniciar qualquer tratamento complementar. É importante ressaltar que o tratamento da fibromialgia é individualizado e pode variar de acordo com as necessidades e preferências de cada pessoa. É fundamental trabalhar em conjunto com uma equipa médica especializada para encontrar as melhores abordagens terapêuticas e desenvolver um plano de tratamento adequado.

- Is it accurate? Yes ___ No ___
- Is the language patient-friendly? Yes ___ No ___

6 - QUE CONSEQUÊNCIAS PODE A FIBROMIALGIA TER?

Which answer is preferable? 1 ___ 2 ___ Neither ___

Answer 1 (SPR) – A fibromialgia não deforma as articulações, não compromete órgãos internos, não necessita de intervenções cirúrgicas e não retira um dia de vida ao doente, mas pode dar dor e afetar a qualidade de vida. Saber isto pode tranquilizar os doentes.

- Is it accurate? Yes ___ No ___
- Is the language patient-friendly? Yes ___ No ___

Answer 2 (ChatGPT) – A fibromialgia pode ter diversas consequências que afetam a qualidade de vida e o bem-estar geral dos indivíduos afetados. Alguns exemplos incluem:

1. Dor crónica: A dor é um dos principais sintomas da fibromialgia e pode ser generalizada, afetando músculos, articulações e tecidos moles. Essa dor persistente e recorrente pode causar desconforto constante, fadiga e dificuldade para executar atividades diárias.
2. Fadiga: A fibromialgia está associada a uma sensação de fadiga intensa e persistente, mesmo após períodos de repouso adequado. A fadiga pode interferir nas atividades diárias, causar falta de energia e afetar a concentração e o desempenho cognitivo.
3. Distúrbios do sono: Muitas pessoas com fibromialgia têm dificuldades em dormir profundamente e acordam frequentemente durante a noite. Esses distúrbios do sono podem levar à sonolência diurna, cansaço excessivo e dificuldade de concentração.
4. Problemas cognitivos: Alguns indivíduos com fibromialgia podem experimentar dificuldades cognitivas, como problemas de memória, concentração e processamento de informações. Esses sintomas são comumente conhecidos como “nevoeiro cerebral” ou “fibrofog”.
5. Alterações emocionais: A fibromialgia pode ter um impacto significativo no bem-estar emocional. Muitas pessoas experimentam ansiedade, depressão, irritabilidade e alterações de humor devido à dor crónica, fadiga e limitações físicas.
6. Limitações físicas: A dor e a fadiga causadas pela fibromialgia podem levar a limitações físicas, dificuldade em realizar atividades físicas e restrições nas atividades diárias, como trabalho, exercícios e tarefas domésticas.
7. Impacto nas relações sociais: A fibromialgia pode afetar as relações sociais, familiares e profissionais, devido às limitações físicas, emocionais e às necessidades de autocuidado. O isolamento social e a dificuldade em participar em atividades sociais podem ser uma consequência dessa doença. É importante destacar que a fibromialgia é uma doença complexa e os seus efeitos podem variar de pessoa para pessoa. Cada indivíduo pode experimentar diferentes consequências e sintomas associados à doença. O apoio médico, a compreensão dos outros e o controlo adequado da fibromialgia podem ajudar a minimizar o impacto dessas consequências e melhorar a qualidade de vida dos doentes.

- Is it accurate? Yes ___ No ___
- Is the language patient-friendly? Yes ___ No ___

EN TRANSLATED VERSION

1 - What is fibromyalgia?

Which answer is preferable? 1 2 Neither

Answer 1 (SPR) - Fibromyalgia is a disease characterised by generalised, diffuse, often migratory musculoskeletal pain and increased sensitivity to a variety of stimuli that can cause pain and discomfort, such as effort, stress or noise. It affects around 2-4 per cent of adults and is more common in women. It can have periods of calm or exacerbation, and the pain and discomfort can be fluctuating. It is often accompanied by fatigue, altered sleep, memory and concentration problems.

- Is it accurate? Yes No
- Is the language patient-friendly? Yes No

Answer 2 (ChatGPT) - Fibromyalgia is a chronic health problem that causes generalised pain and tenderness throughout the body. It is considered a syndrome because it involves a combination of symptoms, including muscle pain, fatigue, sleep disturbances and mood problems. Although the exact cause of fibromyalgia is still not fully understood, it is believed to involve a combination of genetic, physical and emotional factors. The symptoms of fibromyalgia can vary from person to person, but generalised pain and tenderness in the muscles, tendons and joints are common features. In addition, individuals with fibromyalgia often experience extreme fatigue, sleep disturbances (such as insomnia or non-restorative sleep), cognitive difficulties (known as “mental fog”), anxiety, depression and headaches. Although there is no cure for fibromyalgia, treatment aims to relieve symptoms and improve quality of life. This can involve a multidisciplinary approach, including pain relief medication, physical therapy, occupational therapy, cognitive-behavioural therapy and stress coping techniques. Emotional and educational support also play an important role in managing the disease. It is important to seek medical advice if you experience symptoms consistent with fibromyalgia, as a healthcare professional will be able to make a proper diagnosis and draw up a personalised treatment plan.

- Is it accurate? Yes No
- Is the language patient-friendly? Yes No

2 - WHAT CAUSES FIBROMYALGIA?

Which answer is preferable? 1 2 Neither

Answer 1 (SPR) - The origin and cause of fibromyalgia are not very clear. It is thought that there is an increased sensitivity to pain, due to alterations in neurotransmitters and pain processing, both in the peripheral nervous system and the central nervous system, which leads to situations of hypersensitivity to external stimuli. Psychological stress (worry, anxiety) favours this mechanism and also increases the tension that is transmitted to the muscles, increasing pain.

- Is it accurate? Yes No
- Is the language patient-friendly? Yes No

Answer 2 (ChatGPT) - The exact cause of fibromyalgia is still unknown. However, it is believed to be a multifactorial condition, resulting from a combination of genetic, physical and environmental factors. Some of the main factors that may play a role in the development of fibromyalgia include:

- Genetic susceptibility: Certain genetic variants can increase a person's predisposition to developing fibromyalgia. However, it is not a directly inherited condition.
- Changes in pain response: People with fibromyalgia may have an increased sensitivity to pain due to changes in the way the brain and central nervous system process pain signals. This can result in an amplification of painful sensations.
- Sleep disorders: Lack of restful sleep or sleep disorders such as sleep apnoea syndrome can be associated with fibromyalgia. It is believed that sleep deprivation can trigger symptoms and contribute to the development of the disease.
- Emotional factors and stress: Physical or emotional trauma, as well as high levels of stress, can play a role in the development of fibromyalgia. Some individuals develop fibromyalgia after significant stressful events, such as car accidents, injuries or illnesses.

- Inflammatory processes: Some studies suggest that chronic inflammation may be involved in fibromyalgia. However, the exact relationship between inflammation and fibromyalgia is still unclear.

It's important to emphasise that fibromyalgia is a complex disease and its cause can vary from person to person. Proper diagnosis and treatment should be carried out by a qualified health professional, such as a rheumatologist, who can assess the symptoms and develop an individualised treatment plan.

- **Is it accurate?** Yes ___ No ___
- **Is the language patient-friendly?** Yes ___ No ___

3 - WHAT ARE THE COMPLAINTS/SYMPTOMS IN FIBROMYALGIA?

Which answer is preferable? 1 ___ 2 ___ Neither ___

Answer 1 (SPR) – Musculoskeletal pain is generalised, ill-defined, imprecise, diffuse, often migratory (it jumps from side to side) and can vary in intensity. It can be accompanied by tingling, numbness, trembling, sweating and a feeling of stiffness in the joints and muscles. The pain worsens in cold weather, with changes in sleep, and during periods of increased stress, worry or anguish. In addition to musculoskeletal pain, other symptoms are common:

Changes in sleep patterns:

- Initial insomnia (difficulty falling asleep);
- Frequent nocturnal awakenings (fragmented sleep);

Non-restorative sleep;

- Fatigue and tiredness in the morning (“I feel like I’ve been hit by a lorry”);
- Lack of strength and will to carry out daily tasks, intense tiredness and a feeling of physical exhaustion (more so at the end of a day’s work or intense physical exercise);
- Decreased concentration, memory deficit and easy distraction;
- Other manifestations that may be associated:

Intolerance to cold and/or heat;

Irritable bowel syndrome;

Migraine or tension headache;

Menstrual pain;

Temporomandibular joint dysfunction;

Overactive bladder;

Depression.

- **Is it accurate?** Yes ___ No ___
- **Is the language patient-friendly?** Yes ___ No ___

Answer 2 (ChatGPT) – The symptoms of fibromyalgia can vary from person to person and can be persistent or intermittent. Some of the most common symptoms of fibromyalgia include:

1. Generalised pain: Pain is the most characteristic symptom of fibromyalgia. It is a chronic pain that is usually described as a sensation of diffuse, generalised pain throughout the body. The pain can be deep, throbbing or burning. It can vary in intensity and location.
2. Fatigue: Many people with fibromyalgia experience a persistent feeling of fatigue, even after periods of adequate rest. Fatigue can significantly affect energy, the ability to concentrate and carry out daily activities.
3. Sleep disorders: Sleep disorders are common in people with fibromyalgia. This can include difficulty falling asleep, interrupted or non-restorative sleep, waking up tired and having frequent nightmares.
4. Sensitivity to touch: Many people with fibromyalgia have increased sensitivity to touch. They may feel pain or discomfort even with light touch.
5. Morning stiffness: Some people with fibromyalgia experience muscle stiffness and stiff joints in the morning. These symptoms usually improve throughout the day.
6. Cognitive problems: Also known as “brain fog” or “fibrofog”, fibromyalgia can cause difficulty concentrating, memory lapses, mental confusion and difficulty performing cognitive tasks.
7. Emotional symptoms: Fibromyalgia is often associated with emotional symptoms such as anxiety, depression, irritability and mood swings.

In addition to these main symptoms, fibromyalgia can also be associated with other symptoms such as headache, abdominal pain, irritable bowel syndrome, tingling in the hands and feet, sensitivity to light and sound, among others. It is important to emphasise that diagnosing fibromyalgia requires a proper medical assessment.

- Is it accurate? Yes ___ No ___
- Is the language patient-friendly? Yes ___ No ___

4 - HOW FIBROMYALGIA IS DIAGNOSED?

Which answer is preferable? 1 ___ 2 ___ Neither ___

Answer 1 (SPR) - The diagnosis of fibromyalgia is a clinical diagnosis of exclusion and is characterised by the absence of significant alterations on physical examination and in laboratory tests and imaging tests.

- Is it accurate? Yes ___ No ___
- Is the language patient-friendly? Yes ___ No ___

Answer 2 (ChatGPT) - The diagnosis of fibromyalgia is based on a detailed clinical assessment, taking into account the symptoms reported by the patient and excluding other medical conditions that may cause similar symptoms. There are no specific laboratory or imaging tests to diagnose fibromyalgia, so the diagnosis is essentially clinical.

Generally, the doctor will diagnose fibromyalgia if the patient presents the following criteria:

1. Generalised pain: The patient must report pain in at least 4 quadrants of the body (right and left side, above and below the waist) for a minimum period of three months.
2. Tender points: The patient must have pressure sensitivity in at least 11 of the 18 specific points known as tender points. These tender points are located in areas such as the neck, shoulders, chest, elbows, thighs and knees.

In addition to these criteria, the doctor will also consider other common symptoms of fibromyalgia, such as fatigue, sleep disturbances and cognitive problems.

During the assessment, the doctor will rule out other medical conditions that may present similar symptoms, such as rheumatoid arthritis, lupus, thyroid disease, among others. This may involve laboratory and imaging tests to rule out these diseases.

It's important to note that diagnosing fibromyalgia can be challenging, as symptoms can be subjective and vary from person to person.

- Is it accurate? Yes ___ No ___
- Is the language patient-friendly? Yes ___ No ___

5 - HOW IS FIBROMYALGIA TREATED?

Which answer is preferable? 1 ___ 2 ___ Neither ___

Answer 1 (SPR) - The aims of the treatments are to relieve pain, reduce anxiety, improve sleep and improve quality of life in order to maintain good physical, social and family activity.

Non-pharmacological treatment:

- Patient education: this is a fundamental point of treatment. Patients should be aware of the importance of stress, worry and anxiety as triggers and aggravating factors of fibromyalgia, and should control them. The patient must commit to their own treatment.
- Psychological relaxation: leading a calmer life, reducing stress, resolving conflicts, seeking personal fulfilment, greater tolerance. Make time for yourself, to rest, relax, meditate. Try to be happy.
- Regularising sleep: going to bed at regular times, keeping the room dark and quiet; avoiding coffee, tea or tobacco at the end of the day.
- Regular physical exercise: the state of immobilisation to which many fibromyalgia sufferers are consigned in order not to trigger the pain, leads to poor physical condition with reduced muscle strength and flexibility, causing easy tiredness.

Regular physical exercise is essential, as it reduces the intensity of pain and fatigue, the symptoms that patients find most disabling, as well as reducing muscle tension, stress and anxiety, facilitating sleep, favouring motor coordination for daily activities, promoting proper posture, helping with weight control and thus improving self-esteem and self-confidence. The exercise programme has to be individualised for each patient, depending on their physical condition, always taking their preferences into account - using physical activities that match the patient's tastes makes it easier for them to engage. The exercises should be light, unloaded, progressive and small in quantity, but ideally performed daily, following a programmed sequence. The movements should not be strenuous. Patients should be warned that the intensity of their pain may worsen for short periods, particularly during the first two months of

physical activity, but that this will subside and should not be a reason to give up. Some recommended exercises are aqua aerobics in a heated pool, aerobics, Yoga, Tai-Chi and Pilates.

Programmes should include:

- Warming up: improves blood supply to muscles and tendons, adjusting heart and respiratory rates. This improves physical endurance for exercise and even daily activities.
- Muscle strengthening and stretching exercises: important for promoting balance, motor coordination and pain control.
- Aerobic exercise (walking, dancing, aquatic exercise): important for cardiovascular conditioning and weight control - at least 2 days a week, lasting at least 20 minutes;
- Final relaxation: stretching and breathing exercises at the end of the exercise, which aim to “slow down” the body.
- Hot water baths: help to relax and reduce muscle tension and pain.
- Psychotherapy/cognitive behavioural therapy: can be very useful for some patients.
- **Is it accurate?** Yes ___ No ___
- **Is the language patient-friendly?** Yes ___ No ___

Answer 2 (ChatGPT) - The treatment of fibromyalgia is generally approached in a multidisciplinary and individualised way, with the aim of relieving symptoms, improving quality of life and promoting self-care. There is no definitive cure for fibromyalgia, but various therapeutic approaches can be adopted. Here are some commonly used treatment options:

1. Education and self-care: The patient is orientated about the disease and the importance of adopting healthy habits, such as practising low-impact physical exercise, maintaining an adequate sleep routine, managing stress and taking care of mental health.
 2. Medication: Medications may be prescribed to control the symptoms of fibromyalgia, such as painkillers, antidepressants, muscle relaxants and specific medications to improve sleep.
 3. Physical therapy: Physiotherapy and exercises supervised by a health professional can help strengthen muscles, improve flexibility, relieve pain and reduce stiffness.
 4. Occupational therapy: An occupational therapist can help the patient adapt their work environment and daily activities to reduce the impact of fibromyalgia and improve functionality.
 5. Psychological therapy: Cognitive-behavioural therapy can be useful to help patients develop coping skills, manage stress, deal with pain and improve emotional well-being.
 6. Complementary treatments: Some people find relief from their symptoms with complementary therapies, such as acupuncture, massage, relaxation techniques, yoga and meditation. However, it is important to discuss this with your doctor before starting any complementary treatment. It's important to note that the treatment of fibromyalgia is individualised and can vary according to each person's needs and preferences. It is essential to work together with a specialised medical team to find the best therapeutic approaches and develop an appropriate treatment plan.
- **Is it accurate?** Yes ___ No ___
 - **Is the language patient-friendly?** Yes ___ No ___

6 - WHAT CONSEQUENCES CAN FIBROMYALGIA HAVE?

Which answer is preferable? 1 ___ 2 ___ Neither ___

Answer 1 (SPR) - Fibromyalgia doesn't deform joints, it doesn't compromise internal organs, it doesn't require surgery and it doesn't take a day off the patient's life, but it can cause pain and affect quality of life. Knowing this can reassure sufferers.

- **Is it accurate?** Yes ___ No ___
- **Is the language patient-friendly?** Yes ___ No ___

Answer 2 (ChatGPT) - Fibromyalgia can have a number of consequences that affect the quality of life and general well-being of affected individuals. Some examples include:

1. Chronic pain: Pain is one of the main symptoms of fibromyalgia and can be widespread, affecting muscles, joints and soft tissues. This persistent and recurring pain can cause constant discomfort, fatigue and difficulty performing daily activities.

2. **Fatigue:** Fibromyalgia is associated with a feeling of intense and persistent fatigue, even after periods of adequate rest. Fatigue can interfere with daily activities, cause a lack of energy and affect concentration and cognitive performance.
 3. **Sleep disturbances:** Many people with fibromyalgia have difficulty sleeping soundly and wake up frequently during the night. These sleep disturbances can lead to daytime sleepiness, excessive tiredness and difficulty concentrating.
 4. **Cognitive problems:** Some individuals with fibromyalgia may experience cognitive difficulties, such as problems with memory, concentration and information processing. These symptoms are commonly known as “brain fog” or “fibrofog”.
 5. **Emotional changes:** Fibromyalgia can have a significant impact on emotional well-being. Many people experience anxiety, depression, irritability and mood swings due to chronic pain, fatigue and physical limitations.
 6. **Physical limitations:** The pain and fatigue caused by fibromyalgia can lead to physical limitations, difficulty performing physical activities and restrictions on daily activities such as work, exercise and household chores.
 7. **Impact on social relationships:** Fibromyalgia can affect social, family and professional relationships due to physical and emotional limitations and self-care needs. Social isolation and difficulty participating in social activities can be a consequence of this illness. It is important to emphasise that fibromyalgia is a complex disease and its effects can vary from person to person. Each individual can experience different consequences and symptoms associated with the illness. Medical support, understanding of others and proper management of fibromyalgia can help minimise the impact of these consequences and improve patients’ quality of life
- **Is it accurate?** Yes ___ No ___
 - **Is the language patient-friendly?** Yes ___ No ___