

Disease Progression in Multiple Sclerosis: A Literature Review Exploring Patient Perspectives

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Purpose: Multiple sclerosis (MS) prognosis is often uncertain. This literature review considers patients' understanding of, and perspectives on, MS progression to better comprehend the unmet needs of people with MS (PwMS), in order to improve treatment adherence and quality of life (QoL).

Methods: Literature searches for peer-reviewed papers concerning patient perspectives on the progression of MS and comparable conditions, published between January 2000 and January 2020, were conducted.

Results: Little qualitative evidence exists that examines PwMS' perspectives on MS progression. The understanding and meaning ascribed to terms such as "disease progression" vary. Some PwMS find disease labels stigmatizing, confusing, and disconnected from reality. The lack of a clear definition of progression and discrepancies between PwMS and healthcare professional (HCP) perspectives may contribute to misunderstanding and poor communication. Patient descriptions of progression and relapses include symptoms in addition to those evaluated by standard severity and disability measures. Compared with HCPs, PwMS are still focused on relapse prevention but place higher priority on QoL and ascribe different relative importance to the causes of poor adherence to treatment plans. PwMS want to discuss progression and likely prognosis. Such communication needs to be personalized and delivered with sensitivity, at an appropriate time. Poor treatment adherence may arise from a lack of understanding and poor communication, particularly around treatment goals. The few studies that directly considered patient perspectives on the progression of comparable conditions supported and extended the perspectives of PwMS. Lack of adequate communication by HCPs was the most common theme.

Conclusion: Patient perspectives on disease progression in MS and other chronic progressive conditions are under-investigated and under-reported. The limited evidence available highlights the importance of providing adequate information and effective HCP communication. While further studies are needed, the current evidence base offers information and insights that may help HCPs to enhance patient care, well-being, and treatment adherence.

Keywords: multiple sclerosis, disease progression, patient engagement, shared decision-making, communication

Plain Language Summary

Disease progression occurs in most people with multiple sclerosis (PwMS). However, patients' views of what MS progression means are largely unknown. This study aimed to explore patients' understanding of, and perspectives on, MS progression through the review of journal articles published between January 2000 to January 2020.

The study found that:

- Understanding of the term “disease progression” varied among PwMS, their caregivers and healthcare professionals (HCPs). PwMS’ descriptions of progression included symptoms that are not evaluated by standard measures of MS, such as mobility scales.
- Emotional responses to disease progression conversations varied. Some patients were not concerned and wanted to talk about how their disease may change, while others were more distressed by the topic.
- Poor communication with HCPs about MS progression was common. While many PwMS reported a desire to discuss long-term prognosis, there was little opportunity for this. Conversations on MS progression need to occur at an appropriate time, be delivered with sensitivity and be personalized to the patient.
- Understanding of MS progression may help patients stick to their treatment schedule. However, the treatment goals of patients and HCPs can differ. Compared to HCPs, PwMS are more focused on improving symptoms that impact their quality of life and are less focused on preventing relapse.

Overall, this review found that few studies have examined views on MS progression in PwMS. Based on the studies reported, this review highlights the importance of effective communication between HCPs and PwMS, leading to improved MS management and treatment results.

Introduction

Disease progression in multiple sclerosis (MS) occurs in most people with MS (PwMS).¹⁻³ Disease progression in MS can be highly variable, the prognosis is often uncertain and there is no universal consensus regarding terminology or management.^{4,5} Bodily systems in which MS progression can be detected continue to be elucidated.⁶ Lublin et al suggest using “worsening” rather than “progressing” for patients with relapsing MS, reserving “progression” for those with clinically defined progressive disease² – a recommendation adopted here.

PwMS, therefore, have to contend with an uncertain future as their MS worsens or progresses, alongside, in many cases, an accumulating symptomatic burden and increasing levels of disability. In addition, drug treatments, their associated side effects, and the impact of regular monitoring add to the disease burden. Not surprisingly, exacerbations and progressive MS can disrupt many aspects of a PwMS’s daily life, including employment,

daily activities, relationships, establishing a family, and their sense of self.^{7,8} Continuing stigmatization of MS may exacerbate the difficulties^{9,10} and may worsen the disease, which can result in a vicious cycle.^{11,12}

Collaborations between PwMS and healthcare professionals (HCPs) show that enhanced patient understanding of MS disease progression and engagement in care can contribute to improved disease management and quality of life (QoL).^{13,14} However, there is little qualitative evidence regarding patient perspectives on MS disease progression.¹³

Methods

Literature searches for peer-reviewed journal articles concerning patient perspectives on MS disease progression, published between January 2000 and January 2020, were conducted in PubMed using eight keyword search strings (Table 1). Bibliographies of included papers were further searched for relevant articles. Exclusion criteria were determined and results falling under the following categories removed: proceedings, conference abstracts, papers not published in English, and papers concerned with drug efficacy.

The methodology selected has certain limitations. The date range restriction was chosen based on the focus and interests of the MS in the 21st Century initiative as a whole, namely the changing landscape of MS care post-2000. However, the exclusion of earlier publications must be acknowledged as a potential limitation. Similarly, restricting results to articles published in English was a decision made to ensure the accuracy of the authors’ interpretations, but likely excluded publications relevant to the overall focus. Finally, the majority of excluded publications were removed because of a focus on drug efficacy. The decision to avoid clinical trial data and other treatment investigations was taken to restrict results to publications whose primary focus was understanding the perspectives of PwMS and not evaluating medical interventions. However, it is probable that some of the excluded studies would have used endpoints that may be relevant to the topic.

A parallel narrative, rather than a systematic literature review, concerning patient perspectives on disease progression in other chronic or significantly life-altering conditions was conducted using the same search strings with “chronic condition” replacing “multiple sclerosis”. Papers covering the same themes identified in the MS results were selected with a view to contrasting, supporting or expanding the findings of the MS review.

Table 1 MeSH Term Search Strings and Results from PubMed

((multiple sclerosis[MeSH Terms]) AND (disease progression[MeSH Terms])) AND (patient perspective) AND (2000/01/01:2019/12/31[dp]) AND (english [la])	48
((multiple sclerosis[MeSH Terms]) AND (disease progression[MeSH Terms])) AND (communication) AND (2000/01/01:2019/12/31[dp]) AND (english [la])	41
((multiple sclerosis[MeSH Terms]) AND (disease progression[MeSH Terms])) AND (patient engagement) AND (2000/01/01:2019/12/31[dp]) AND (english [la])	5
((multiple sclerosis[MeSH Terms]) AND (disease progression[MeSH Terms])) AND (biographical disruption) AND (2000/01/01:2019/12/31[dp]) AND (english [la])	0
((multiple sclerosis[MeSH Terms]) AND (disease progression[MeSH Terms])) AND (patient acceptance) AND (2000/01/01:2019/12/31[dp]) AND (english [la])	46
((multiple sclerosis[MeSH Terms]) AND (disease progression[MeSH Terms])) AND (patient education) AND (2000/01/01:2019/12/31[dp]) AND (english [la])	11
((multiple sclerosis[MeSH Terms]) AND (disease progression[MeSH Terms])) AND (treatment adherence) AND (2000/01/01:2019/12/31[dp]) AND (english [la])	79
((multiple sclerosis[MeSH Terms]) AND (disease progression[MeSH Terms])) AND (increased disability) AND (2000/01/01:2019/12/31[dp]) AND (english [la])	527
Total results returned	757
Publications identified	683
Full text review and inclusion	7

Results

The initial searches using PubMed MeSH terms identified 757 results across the eight search terms which consisted of 683 publications (Table 1). Following the application of exclusion criteria based on abstract content, 7 publications were identified for full text review and inclusion. Searches were then expanded by removing MeSH term restrictions and resulting in 2332 results across the eight searches which consisted of 2077 publications (Table 2). Following the application of exclusion criteria to these expanded results and additional 7 publications for review and inclusion. Exploration of the bibliographies of these 14 publications identified a further 13 papers of relevance to the topic and meeting the criteria for inclusion. Figure 1 shows the PRISMA flow diagram of the combined results.

Full text review of the 27 papers selected for inclusion led to the identification of four key themes which the results of the included papers were categorized into:

- Knowledge and understanding of MS disease progression
- Emotional responses and attitudes to MS disease progression

- Communication with healthcare professionals regarding MS disease progression
- Disease progression and treatment adherence

Following additional searching of papers from non-MS chronic and progressive conditions, 21 papers were selected for full text review. Discussion of the results of these studies is included in a later section of this paper that looks at how the patient perspectives, of disease progression, in these other conditions compare with those of PwMS.

Knowledge and Understanding of MS Disease Progression

The understanding of terms such as “disease progression” varies considerably among PwMS and their caregivers.^{15,16} Some patients find disease labels stigmatizing, confusing, and divorced from the reality of their lives with MS.¹⁵ Cognitive symptoms may interfere with their ability to understand information.¹⁷ Moreover, there may be wide variation in the meanings that PwMS ascribe to disease progression.¹⁶

A lack of clarity on the definition of MS progression among neurologists may contribute to the variation in the

Table 2 Expanded Search Strings and Results from PubMed

Multiple sclerosis progression patient preference AND (2000/01/01:2019/12/31[dp]) AND (english [la])	36
Multiple sclerosis progression communication AND (2000/01/01:2019/12/31[dp]) AND (english [la])	253
Multiple sclerosis progression patient engagement AND (2000/01/01:2019/12/31[dp]) AND (english [la])	64
Multiple sclerosis progression biographical disruption AND (2000/01/01:2019/12/31[dp]) AND (english [la])	1
Multiple sclerosis progression patient acceptance AND (2000/01/01:2019/12/31[dp]) AND (english [la])	220
Multiple sclerosis progression patient education AND (2000/01/01:2019/12/31[dp]) AND (english [la])	45
Multiple sclerosis progression treatment adherence AND (2000/01/01:2019/12/31[dp]) AND (english [la])	304
Multiple sclerosis progression increased disability AND (2000/01/01:2019/12/31[dp]) AND (english [la])	1409
Multiple sclerosis progression patient preference AND (2000/01/01:2019/12/31[dp]) AND (english [la])	36
Total results found	2332
Publications identified	2077
Full text review and inclusion	7

understanding of disease progression terminology among PwMS. There is no universally accepted definition and no clear relationship between different clinical metrics, such as magnetic resonance imaging (MRI) results and Expanded Disability Status Scale (EDSS) disability-based metrics and physical findings.^{18,19} Discrepancies in what disease progression means for PwMS and HCPs may further hinder shared understanding. Patient descriptions of progression and MS relapses are practical and include symptoms such as fatigue, pain, and cognitive impairment, in addition to those evaluated by standard severity and disability measures of MS.²⁰

There is also confusion among some PwMS about MS classification. Findings from an online survey of 215 adults with secondary progressive MS (SPMS) of ≥ 5 years' duration in Italy and Germany showed that 57% were aware of their diagnosis in Italy compared with 77% in Germany. Moreover, 48% and 56%, respectively, reported not receiving information on SPMS, indicating a need to improve patient-physician communication.²¹ Likewise, a French study of patient perceptions of MS and its treatment reported that more than half of PwMS (57.4%; n=202) did not consider themselves well informed about their disease.²² Similarly, in a small-scale UK study designed to explore PwMS (n=20) and caregiver (n=13) experiences during patients' transition to SPMS, some were surprised to discover that the disease had progressed to SPMS and did not understand how the diagnosis had been reached, which increased

their confusion. On the other hand, other patients had accepted their disease progression and found the label of little relevance.¹⁶

Emotional Responses and Attitudes to MS Disease Progression

Emotional responses of PwMS to a diagnosis of SPMS also varied considerably. Some PwMS were unperturbed by the label, while others had strong emotional reactions, which, in some cases, required additional psychological support. Some PwMS may be distressed that an SPMS diagnosis limits the disease-modifying therapy (DMT) options. Some view the news that further follow-ups with the MS multidisciplinary team will be reduced with a "sense of abandonment".¹⁶ Disbelief, hopelessness and a sense of loss are common responses.^{16,23,24} Such negative reactions can be severe and often persist long term.²⁵ Patients' levels of hopefulness are extremely individual and variable, though an attitude of hope is important in order for PwMS to accept and live with MS.²²

Indeed, suicide rates in PwMS are approximately double those in the general population.²⁶ In an analysis of 28 interviews involving 14 patients with primary progressive MS (PPMS) or SPMS, Frost et al found that disease progression may be associated with thoughts of suicide, suggesting a need for improved dialog between patients and professionals to ensure that PwMS are adequately supported throughout the disease course.⁸ In common with the above studies, Frost et al

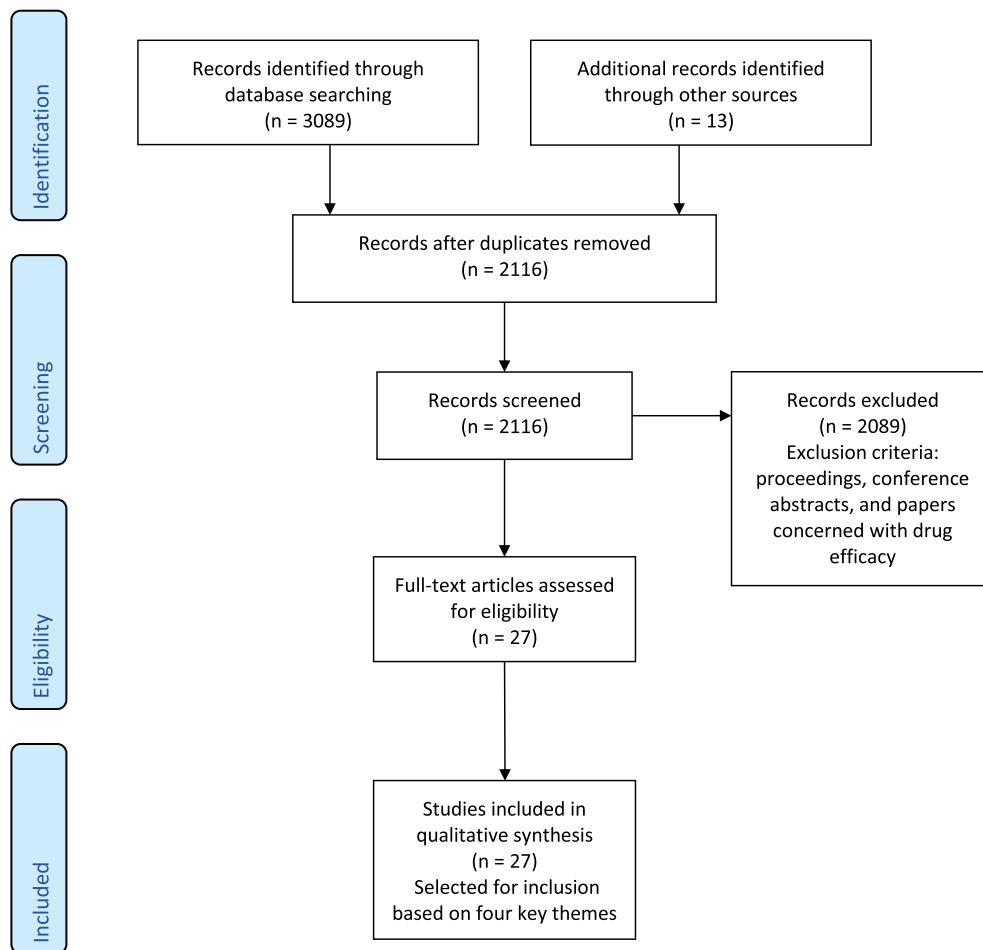


Figure 1 PRISMA flow diagram of combined results across both stages of methodology taking into account duplicates in each individual stage and between stages.

Notes: PRISMA figure adapted from Liberati A, Altman D, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *Journal of clinical epidemiology*. 2009;62(10). Creative Commons.⁸⁴

also reported that PwMS experience loss of self-identity. Some patients also experienced reductions in their ability to manage, resilience, and hope.⁸

A patient's cultural background may influence their responses to MS progression. One study found that UK patients of Black Caribbean descent were more likely to experience extremes of frustration, loss, and confusion due to more rapid disease progression than their white counterparts.²⁴

Successful coping by PwMS, in general, requires accepting the diagnosis and progression of MS, awareness that its effects can often be managed and that this management must be integrated into daily life.²⁷ An attitude of hope seems to help PwMS overcome the challenges of MS and accept the illness and its prognosis²³ taking into account that levels of hopefulness can be extremely individual and variable. In a study involving 54 patients with RRMS, Król et al show that focusing on a positive future,

rather than dwelling on negative past events, can enable disease acceptance and conclude that psychological support may benefit PwMS in the early stages of disease progression.²⁸

Communication with HCPs Regarding MS Disease Progression

Poor communication regarding MS disease progression was a consistent finding, which may partly arise from differences in the perspectives of PwMS and HCPs. A survey of 3175 UK MS Register members found that most PwMS wanted to know their long-term prognosis. However, there was a lack of opportunity for such discussions. As a result, this need frequently remained unmet.²⁹ A survey by the German MS Society of 573 PwMS found that more than three-quarters felt it was important to discuss disease progression with their doctor.²⁹ The study

also found that doctors who PwMS perceived as communicating poorly were considered less empathetic.³⁰ An interview-based study of 25 PwMS in Iran also found that patients want to discuss disease progression with HCPs and most participants looked at this as a chance to receive counselling from their doctor or nurse. However, most were dissatisfied with their HCPs, especially their doctors, because they lacked empathy, which undermined trust.⁷ In a series of 15 in-depth semi-structured interviews, PwMS in the UK reported having minimal communication with HCPs about their prognosis and complained of a lack of opportunity for such discussions.³¹ Some communication issues may be due to the work conditions of HCPs. In particular, an Italian interview-based study of 105 HCPs and nurses showed that compassion fatigue and burnout were common due to intensive working practices, under-resourcing of medical personnel, and anxiety caused by employment conditions.³²

The importance of sensitive communication with patients transitioning from RRMS to SPMS was highlighted in a qualitative study involving PwMS (n=9) and specialist MS HCPs (n=7) in the UK.³³ The transition to SPMS came as a shock to some PwMS. Several PwMS suggested that sufficient information provision and support were lacking at this stage compared with their initial diagnosis, and the investigators inferred careful consideration of the timing of such information is paramount, given the potential distress and the fact that not all PwMS progress to SPMS.³³ Many reported feeling abandoned by their MS-specialist HCPs.³³ A lack of understanding of disease progression can make PwMS reluctant to discuss this with their HCP. This highlights the importance of developing and using patient-friendly language to describe MS progression.¹⁵

The timing of information delivery is an important consideration. Davies et al describe how some PwMS with worsening MS gradually become aware of their increasing disability. Some PwMS report feeling frustrated that their neurologist does not start conversations about disease progression.¹⁶ In addition, Methley et al concluded that continuity of care and patient-centered care (ie, HCPs working collaboratively with patients to support them in developing the confidence, knowledge, and skills to effectively manage their health and healthcare and make informed decisions³⁴) are pivotal to positive healthcare experiences for both PwMS and professionals.³⁵

Nevertheless, determining elements of optimal communication between HCPs and PwMS about disease

progression is challenging and no consensus exists.^{19,29,32,36} The studies reviewed in this paper suggest that communication on disease progression with PwMS need to be delivered with sensitivity, at an appropriate time, and personalized to each patient's disease, treatments, experiences, and understanding.

Disease Progression and Treatment Adherence

The review suggested that PwMS' understanding of disease progression and its treatment, along with effective communication, improves treatment adherence. Conversely, poor adherence may arise from a lack of understanding and poor communications, particularly around treatment goals. In a French cross-sectional observational study 89% of PwMS (n=202) totally or partly agreed that treatment would prevent relapses, and 85% totally or partly agreed that treatment would help to delay disease progression. Adherence was significantly higher in well-informed patients.²² However, patients often feel that neurologists do not discuss treatment goals, which play an important role in patients' willingness to adhere to treatment. In a questionnaire-based study of 107 PwMS and 18 neurologists in the Netherlands, 69% of PwMS indicated that they had discussed the treatment goal of a "reduction in disease progression" with their neurologist, whereas 94% of the neurologists reported the same discussion having taken place. More than a quarter of the PwMS (27%) said they would prefer to have more information regarding their treatment.³⁷

Furthermore, another study found PwMS are less focused on the prevention of relapses than their physicians, and more focused on QoL.²⁵ Patients' treatment goals tend to focus on improving specific symptoms that impact their daily lives, whereas providers' goals focus on slowing disease progression.³⁸ These findings report the limitations of using only treatment goals defined by HCPs and investigators and suggest that a more patient-centred approach could be used to maximise the relevance to PwMS.³⁸ PwMS may view pharmacologic treatment with feelings of resignation and discomfort, and have to learn to integrate the treatment into their life and manage side effects.³⁹

Patients and HCPs also report different reasons for poor treatment adherence. A survey conducted in seven countries found that 82% of HCPs (n=280) thought side effects were the main reason for patients taking a break

from or stopping treatment, followed by “no sign of disease declining” (54%). In contrast, 42% of patients (n=331) cited side effects as being the main reason, followed by “being emotionally drained/fed up with treatment” (13%), “practical issues in taking treatment” and “treatment not working” (9% each).⁴⁰ Lastly, a study of patient perspectives on using DMTs for MS found that considering and adhering to treatment are not primarily determined by individual, rational deliberation. Rather, constantly being confronted with the disease, managing an inevitable decline, hopes of delaying disease progression and the value of social support strongly influenced choice.⁴¹

Comparison of PwMS' Perspectives on Disease Progression with Patients with Other Chronic Progressive Conditions

Literature searches on comparative conditions identified few studies that directly considered patient perspectives on disease progression, as was the case with MS. However, those identified as relevant supported and extended the perspectives of PwMS.

People with long-term conditions consistently say that they want to be listened to, involved in decisions regarding their care and given access to information that will help them make these decisions. However, many challenges lie in achieving accurate prognostication due to PwMS individual variability. Essentially, these people want support with understanding their condition and managing it, and they want to be treated holistically.⁴² In a prospective longitudinal survey from Norway, providing cancer patients with satisfactory information improved the patients' knowledge about their disease and its treatment.⁴³ A study from the Czech Republic of the impact of information provision and delivery on patients with progressive neurological disease (including MS, Parkinson's and atypical Parkinson's disease, and Huntington's disease) employed in-depth interviews with 20 participants (patients, family members, professionals). Participants often felt that the information provided and the delivery of this information were inadequate, especially regarding disease transitions and progression.⁴⁴ Such a lack of disease awareness and understanding could have negative impacts on patients' family members and caregivers. Indeed, the sufficient provision of information for family members is one of

the key unmet needs in the care of patients with chronic conditions.⁴⁴

Lack of adequate communication by HCPs was the most common recurring theme. As with MS, this theme is reflected in studies of breaking bad news to patients with other potentially life-limiting conditions, revealing room for improvement and providing indications of potentially beneficial ways forward. A questionnaire survey of UK patient preferences regarding the delivery of a cancer diagnosis (n=244) found that patients who were dissatisfied commented on the pessimistic or unsympathetic manner of the doctor.⁴⁵

A large-scale survey of Canadian patients with life-changing diagnosis (n=1337; including cancer, lupus, amyotrophic lateral sclerosis (ALS), MS, HIV/AIDS, and Parkinson's disease) was used to assess one of the most widely used guidelines for breaking bad news – SPIKES. The SPIKES guideline largely reflected the perspectives of the different patient groups. The four most important components of SPIKES from patients' perspectives were physicians demonstrating empathy, explaining their diagnosis and its implications, taking their time rather than rushing patients, and asking patients if they understood.⁴⁶ A much smaller-scale study (n=30 patients) from Sweden found that the doctor's character and their facility in creating personal relationships affected patients' ability to cope with communications regarding the transition from curative to palliative cancer care.⁴⁷

A survey of patients from the USA with amyotrophic lateral sclerosis (n=144) and their caregivers (n=123) found that 56% of patients rated their HCP's breaking of the news as “average”, “below average” or “poor”. Better communication assessed using the SPIKES protocol, along with more time discussing the diagnosis correlated with increased patient and caregiver satisfaction.⁴⁸ Likewise, a UK study of the perceptions and interpretations of patients (n=13) receiving a lung cancer diagnosis identified communication as a key issue. Patients cited, for example, doctors' use of the words “tumor” and “growth” without regard to patients' understanding.⁴⁹ The patients' reactions and attitudes to their illness and its treatment varied widely, underlining the need for a personalized approach to care.⁴⁹

As with MS, some patients with other chronic progressive conditions may be ambivalent about HCP communications regarding disease progression.⁵⁰ Although most patients want to receive details of their prognosis,^{45,51} they may prefer the communication of this information

to be tailored to them regarding the format, extent and timing of prognostic information delivered by doctors.⁵¹

The papers examining other chronic progressive conditions confirm that diverse factors influence adherence and nonadherence to treatment, including patients' health beliefs, motivation and perception of illness control, and relationships and communication with HCPs.^{52,53} Patients' sense of responsibility, fear of complications and continuity of care can also influence treatment adherence.⁵⁴ Indeed, poor patient understanding can be a key factor in inadequate adherence and management of chronic progressive conditions. A study of patient perspectives on diabetes and its management in 12 patients with type 2 diabetes in Bangladesh found numerous misconceptions regarding the disease, poor knowledge of diabetes medications, their use and side effects, and noncompliance with their physicians' advice on diet and physical activity.⁵⁵ Drug costs, concerns around side effects and forgetfulness may be further factors in nonadherence.⁵⁵

In a longitudinal study of patients with incurable cancer, the distress associated with fluctuations in the disease diminished over time, and patients grew accustomed to the disease, describing it as part of themselves. Most talked about their disease in a neutral or optimistic way, while HCPs typically encouraged hopefulness and optimism.⁵⁶

Maintaining hope is an important coping strategy in patients with incurable cancer.⁵⁷ A series of focus groups and interviews explored attitudes among patients with terminal cancer, caregivers from palliative care services and HCPs. Most participants believed that there were ways of maintaining hope and fostering coping, and that HCPs can help to facilitate this with patients and their caregivers.⁵⁷ Similar results were reported in a large study of older adults (>60 years; n=2293) in Sweden, showing that high life satisfaction and a positive health outlook were associated with lower rates of accumulation and progression of multi-morbidity and disability.⁵⁸ Again, good patient knowledge and understanding of chronic conditions are pivotal. Lack of understanding and participation in self-care behaviours limits the effectiveness of treatment, while, conversely, progressive levels of health literacy can gradually improve patients' ability to become active participants in their care.⁵⁹ Encouraging such patient participation may prove invaluable both individually and collectively. When asked, in a citizen science study of adults with long-term conditions in France, patients provided a wealth of ideas on improving their standards of care across the piece, from HCP-patient

discussions to the coordination and collaboration of inpatient and outpatient care.⁶⁰

Discussion

This review captured the perspectives of PwMS on disease progression from a variety of multi-patient studies (survey, interview-based, thematic analysis of personal narratives, focus group discussions, etc.) and considered findings on patient perspectives from other chronic progressive conditions. The findings build on two recent reports from a series of collaborative workshops with PwMS and HCPs, hosted by the MS in the 21st Century initiative, and designed to further the aims of shared decision-making and management. The first report highlighted key unmet needs in the care of PwMS, including the need for improved communication on complex issues such as disease progression, along with practical actions that could be undertaken to address these.¹³ The second report considered the risks and benefits of open communication about disease progression and potential ways of optimizing such conversations.⁶¹ The results of this review support the views highlighted in these two reports.

The aim of this literature review was to identify the number and relevance of publications that relate specifically to patients' understanding of MS disease progression. The results demonstrated only a small number of publications fall into this category, despite the importance of this topic. It also demonstrated that greater PwMS' understanding of their condition improved communication between patients and HCPs, and shared decision-making will, in general, decrease patients' distress, help them adapt to MS, and potentially improve treatment adherence and overall outcomes. The findings from this review indicate that further studies could be done to understand if these factors correlate with objective measures of adherence and changes in clinical metrics. Patient preference to treatment options can be affected by the attribute-based communication used by HCPs.⁶² Reducing patients' distress is particularly important, since negative emotional responses in PwMS can persist over the long term²⁵ and potentially causes a range of negative impacts, including on QoL,^{12,25,63} patients' sense of self-identity, and adding to the disruption to other aspects of their lives.^{8,23,64} Chronic illness has long been known to cause biographical disruption (the way that illness disrupts the imaged future that a patient had previously pictured).⁶⁵ Indeed, there are numerous parallels between PwMS' experience of disease progression and those of patients with other chronic progressive conditions. Further studies would be interesting to directly compare attitudes on disease progression and self-

management in PwMS and those with other chronic progressive conditions and any impact on treatment adherence.

The importance of good communication between PwMS and HCPs is well known.^{22,66–69} Research on the breaking of bad news to patients with cancer and (to a lesser extent) with ALS consistently shows the critical importance of effective communication, and that patient satisfaction is largely determined by the HCP's interpersonal skills. However, discrepancies in expectations of HCPs and patients can have many negative effects, including treatment delays and diminishing patient trust.⁷⁰ Similarly, a thematic analysis of first-person meta-narratives created from a series of systematic reviews and qualitative focus-group-derived data representing seven brain disorders (MS, Parkinson's disease, alcohol dependence, depression, epilepsy, schizophrenia, stroke) showed strong commonalities in both the psychosocial difficulties and the factors influencing these across different disorders. Difficulties in communication were frequently identified, while stigma and social exclusion negatively impacted on these across the different disorders. Conversely, access to work and supportive relationships with family and friends, as well as self-help groups, had a considerable beneficial effect.⁷¹

The prognosis of MS has improved considerably in recent decades, due in part to the availability of more effective DMTs⁷² – including one approved for PPMS⁷³ and several for SPMS. There has also been a marked improvement in the symptomatic management and treatment of MS. The change in treatment paradigms has the potential to significantly alter the landscape of MS communication by engendering positivity in both PwMS and HCPs. Yet as long as the prospect of progression remains, the communication skills of neurology consultants will be critical in facilitating patient acceptance and maintaining hope during conversations about the future.^{19,74} This reflects increasing evidence that good patient-HCP communication is, in general, associated with greater patient and doctor satisfaction and improved patient outcomes compared with poor communication.⁷⁵ Adequate health-care resources, including training in communication skills for neurologists and other MS-specialist HCPs, is also fundamental to good communication.^{13,76} Newly diagnosed patient education initiatives may also play a role in enabling improved communication with MS-specialist HCPs, and in encouraging patients to self-manage.⁶¹

Acceptance, adaptation and self-management strategies can be invaluable in helping PwMS to cope psychologically and emotionally.^{7,19,77} Indeed, positive perceptions of MS by patients have been found to correlate more

strongly with disease self-management than clinical variables, such as the severity, duration and type of MS.⁷⁸ Inclusion of patient perspectives and engagement may even improve the clinical utility of disease progression assessments.⁷⁹ Online communication is increasingly changing the patient-HCP dynamic by empowering patients to become more active participants in joint decision-making and may present an opportunity for open and early conversations on progression.^{80,81} Looking forward, technological developments, such as mobile phone apps, could aid self-management, although these will need to be validated.^{82,83}

In conclusion, patient perspectives on progression in MS and chronic progressive conditions reveal further opportunities for exploration and areas where MS care could improve. The limited evidence available, summarized in this review, highlights the importance of good communication between HCPs and PwMS to improve PwMS' experience and outcomes. While further studies are needed, the current evidence base offers information and insights that may help HCPs to enhance patient care, well-being, and adherence.

Data Sharing Statement

The database query/search strings and analyzed datasets from this study are available from the corresponding author on reasonable request.

Ethics Approval and Informed Consent

This study did not involve human subjects and/or animals or the use of identifiable patient data; therefore, ethical approval and informed consent were not required.

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Author Contributions

All named authors had full access to all of the content within this manuscript and take complete responsibility for the integrity and accuracy of the content. All named

authors take responsibility for the integrity of the work as a whole and have given their approval for this version to be published.

Disclosure

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