

Further Reading and References

Types of Group Medical Visits

Current research literature is becoming increasingly specialized in terms of GMV type and structure. Numerous models and approaches to group care have been developed, trialed and studied over the past two decades, including some models designed for specific health conditions, patient populations, and health care providers.

Different models and approaches

In a 2019 systematic review of GMVs, researchers observed the three most prevalent models being studied as well as practiced were: 1) drop-in group medical appointments (DIGMAs), 2) cooperative healthcare clinics (CHCCs) and 3) group prenatal care. Other researchers have noted the development of integrative shared medical appointments (ISMAs) and programmed shared medical appointment (PSMAs), which each have unique features in addition to the core GMV elements (Egger, 2018; Thomson-Lastad, 2019; Wadsworth et al. 2019).

Drop-In Group Medical Appointments (including physical SMAs) were first trialed at Kaiser Permanente to increase primary care access; typically for routine health issues and usually have different patients each session (Northern Health, 2007; Wadsworth et al. 2019).

- Often used for heterogeneous patient groups with various health conditions
- Researchers indicate they can be suitable for initial consultations or evaluations of new patients

Cooperative Healthcare Clinics are ideal for the same patients meeting on a regular basis (monthly) with similar health issues; a good fit for patients who are high utilizers of primary care (elderly, frail patients) (Wadsworth et al. 2019). Typical themes for condition-focused cooperative healthcare clinics:

- Diabetes
- Hypertension
- Arthritis
- Asthma
- High cholesterol
- High blood pressure
- Chronic pain

Group Prenatal Care (GPNC) as well as group antenatal care has demonstrated reliable improvements of outcome measures compared to individual care when adhering to a validated GMV program such as CenteringPregnancy (Wadsworth et al. 2019).

Integrative Shared Medical Appointments seek to integrate primary care consultations with alternate and complementary therapies such as group education for nutrition, mindfulness and meditation, as well as yoga, tai chi, and acupuncture. Largely targets people living with chronic conditions such as diabetes, chronic pain, and cardiovascular disease (Thompson-Lastad et al. 2019).

Programmed Shared Medical Appointments are an evolution of CHCCs that provide opportunities for patients with chronic diseases to receive a curriculum of sequenced information and education in addition to ongoing care and support from healthcare practitioners and peers. (Egger, 2018). Weight control, smoking cessation, prenatal and postpartum, and anxiety & depression are all well-suited to programmed material delivered in a group format (Egger, 2018).

Different patients and health conditions

Diabetes

While researchers have examined GMVs for patients with heart disease, COPD, dementia, mental illness, and other chronic health conditions, a large majority of current research has focused on diabetes (Drake et al. 2019; Housden et al. 2016; Wadsworth et al. 2019). Whether as a CHCC or a sequentially-planned PSMA, diabetes-focused GMVs have been shown to decrease hospitalizations, improve clinical outcomes, quality of life, patient satisfaction and provider productivity (Drake et al. 2019; Ganetsky et al. 2017; Housden et al. 2016).

- *Patient education* – A review of GMVs specific to diabetes noted that while self-management education is a clinical guideline for patients with diabetes, referrals to diabetes education by primary care providers have been historically low, and that GMVs therefore present an opportunity to provide both care and education concurrently (Ridge, 2012).
- *Clinical outcomes* – Numerous studies have shown reliable and sustainable improvements of HgA1c levels in diabetic patients attending GMVs (Drake et al. 2019; Ganetsky et al. 2017; Omogbai & Milner, 2018). The US Department of Veterans Affairs (VA) followed thirty veterans with diabetes attending GMVs over a six-month period and remarked a significant improvement in nearly all outcome measures, including HgA1c level, blood pressure, total cholesterol, low-density lipoprotein, triglycerides, BMI. Moreover, there were no hospitalizations over the six months, and patient satisfaction also improved significantly (Omogbai & Milner, 2018).
- *Patient adherence and self-management* – Leung and colleagues (2018) found that clinical benefits accrued by diabetic patients who attended GMVs were sustained after those patients had returned to usual care. Compared to diabetic patients who only received usual care, those who attended a GMV had stabilized their diabetes control after two years (Leung et al. 2018).

Obesity

Obesity rates in the United States have remained largely static despite an increasing number of available treatment options, including diet and exercise plans, appetite-suppressing medications,

weight-loss devices and bariatric surgery. Research has focused on both barriers and facilitators to treating obesity:

Barriers to Reducing Obesity Rates:

- Shibuya and colleagues (2018) take the position that obesity is a chronic and complex health problem that requires continuous medical management from a multidisciplinary team
- Long-term, highly-individualized treatment strategies may be more effective in managing the complexity of obesity, which is challenging with current primary care models (Shibuya et al. 2018)
- Obesity often not appropriately managed due to many factors, including a focus on treating obesity-associated comorbidities instead of directly treating issue of excess weight (Shibuya et al. 2018)

Facilitators to Reducing Obesity Rates:

- Researchers at Cleveland Clinic sought to demonstrate the potentially significant value in employing a multidisciplinary team and strategy to combine physical activity, nutrition, appetite suppression, stress management, and sleep hygiene (Shibuya et al. 2018)
- A systematic review of studies examining weight loss results in individual treatment compared to group medical visits was conducted by Paul-Ebhohimhen and Avenell and concluded group treatment resulted in more substantial and sustainable weight loss (Ebhohimhen & Avenell, 2009)
- The Australasian Society of Lifestyle Medicine (ASLM) studied (2018) the use of group visits, and specifically PSMAs, to improve both efficacy and cost-effectiveness in obesity management. Researchers noted some of the model's structural features could potentially address the inherent complexities associated with both successfully reducing weight and maintaining long-term weight loss, including (Egger et al. 2018):
 - Multidisciplinary involvement and collaboration
 - Increased engagement of patients in their own care, i.e. self-management, ownership
 - Significant time allotted for individual and group counseling
 - Evidence-informed weight-loss information that is clear and feasible for patients

Different teams and co-leaders

GMVs foster shared learning by enabling participants to teach and learn from one another in a clinical discussion moderated by facilitators and content experts like family physicians, nurse practitioners, pharmacists, dietitians, and other allied health professionals. For GMVs focused on a particular condition like diabetes or obesity, GMV design can vary and adapt according to the needs of the patient population being targeted (Leung et al. 2018).

Some health teams have taken this modified, condition-specific intervention a step further by including health professionals with specialized training in diabetes to both improve clinical outcomes and patient experience while also reducing health costs (Ganetsky et al. 2017). Health

groups and organizations across North America have trialed GMVs with a focus on diabetes, as well as diabetes-focused GMVs led by nurse practitioners, endocrinologists, and pharmacists (Ganetsky et al. 2017; Housden & Wong, 2016; Wu et al. 2018).

Nurse Practitioner-led GMVs

Researchers in Detroit, Michigan studied the rollout of a seven-week NP-led GMV focused on diabetes at a federally qualified health center (FQHC), with the finding that the program improved participants' diabetes empowerment and A1C levels over the course of seven weeks (Davis et al. 2019).

Housden et al. (2016) examined the challenges and complexities associated with implementing group medical visits into daily primary care practice for nurse practitioners in British Columbia, focusing particularly on how GMVs fit into their practice, as well as navigating the NP scope of practice and role constraints. A key finding from Housden et al. (2016) was the shift in power dynamics between providers, where each gets a better understanding and appreciation of their colleagues' various clinical and professional skills and capacities (e.g. diabetes expertise) as well as individual strengths and weaknesses (e.g. moderating group discussion), an observation that was also noted by Ariana Thompson-Lastad (Housden et al. 2016; Thompson-Lastad, 2019). In observing GMVs in community health centres, Thompson-Lastad noted their tendency toward participatory care, remarking shifting social relations including increased peer support and greater role for patient knowledge.

Housden et al. (2017) used a comparative case study design where NP care for patients with chronic conditions was contrasted with when they had group medical visits or not. The results show that confidence of patients to manage their conditions increased in the GMVs, and they felt more prepared to self-manage their conditions. GMVs supported change through a) greater acquisition of health and interpersonal knowledge through connecting and sharing between providers and patients, as well as b) relationship shifting between providers and patients that allowed for increased engagement and more patient control of their primary care (Housden et al., 2017).

Endocrinologist-led GMVs

Ganetsky and colleagues examined a diabetes-focused GMV in Camden, New Jersey, that placed an endocrinologist in the leading role for a GMV. This GMV team consisted of an endocrinologist, advanced practice nurse, pharmacist, and licensed practical nurses. Researchers and clinicians reasoned an endocrinologist's expertise would be best optimized in a group setting and would address the growing imbalance of current and projected shortages of endocrinologists against projected increases in diabetes incidence (Ganetsky et al. 2017).

The study's results supported these premises, as well as the claim that those referred to these GMVs by endocrinologists would be high complexity diabetic patients requiring greater resources and support, thus optimizing health resources (Ganetsky et al. 2017). Endocrinologist productivity was also reportedly doubled in this study, with specialists seeing twice as many patients in group visits than individually, as well as improved access to endocrine care for diabetes patients, determined by the performance metrics "reduced waiting for appointments for new patients" and "reduced waiting between follow-up visits" (Ganetsky et al. 2017).

Pharmacist-led GMVs

Pharmacist-led group medical visits (without physician involvement) have been demonstrated to be effective in achieving improved outcomes for patients living with type II diabetes mellitus (T2DM) (Wu et al. 2018). Researchers followed one such GMV over 13 months and recorded similar improvements to cardiovascular risk factors compared to those achieved with usual medical care involving a physician (Wu et al. 2018). A key finding from this study was that per capita costs actually decreased over the year within the GMV group, while increasing over the year within the usual care group (Wu et al. 2018).

The finding that pharmacist-led GMVs resulted in similar rates of hospitalization and death compared to standard care was remarked by researchers as having potentially significant implications on distribution and organization of health resources (Wu et al. 2018). In a different study that examined a heart failure GMV, researchers defined SMAs as “visits in which several patients meet with 1 or more providers at the same time”, noting for patient groups with high medication burdens and rates of medication-related problems, SMAs featuring a pharmacist can reduce the odds of heart failure patients becoming hospitalized by 45% (Cohen et al. 2017). Cohen and colleagues inferred part of the reason for this as GMVs addressing common problems such as dosage omission or inappropriate dosage that are common topics discussed in GMV discussions (Cohen et al. 2017).

Cost and Value of GMVs

Resource and time costs

Total costs for implementing GMVs are a function of both time and resources, including human health resources, program materials, and time required for the preparation, training, execution and review of GMV implementation processes. Upfront costs increase during implementation due to the additional time and resources required for planning, training, and education, as well as administrative duties required for organizing a GMV (selecting patients, sending invitations, confirming attendance, setting up sessions, etc.). There are numerous structures for funding these upfront and ongoing costs that can be tailored to local needs and context.

According to Michele Hannay of *Toward Optimized Practice in Alberta*, physicians that were initially concerned about the reduced face-to-face time for patients in a group setting. However, she noted that after the initial period, an average of 5 minutes per patient gradually declined as patients began bringing more of their questions to the group discussion (Michele Hannay, 2019). Supporting this notion, a study from Germany examining perceptions of time constraints among primary care providers found that time needed is often perceived to be greater than time actually used in 1:1 consultations. The researchers also found that time stress was more pronounced with providers earlier in their career as well as with new intake appointments (Knesebeck et al. 2019).

Value to providers

Providers frequently face higher demand from patient needs than they have supply of staff or time (Wong et al. 2016). This can result in decreased provider satisfaction due to reduced productivity levels, repetition of the same advice to numerous patients as well as patient non-adherence to

medical advice, and administrative burden. The provider value of GMVs is in directly addressing these specific sources of frustration to practitioners.

- Rather than increasing income, providers benefit from greater job satisfaction by making measureable progress with complex patients, regular patients, and waitlists (College of Family Physicians of Canada, 2017)
- Improved supports from both facilitators and patients enables providers to focus on medical practice
- Supports development of team-based care – allowing patients to meet team members and observe team dynamics can change how patients approach primary care (Wong et al. 2016)
- Variety added to daily medical practice often re-energizes career

Value to patients

Patients with chronic conditions frequently need more support, attention and information than those without, and are often frustrated with their experience in primary care, due to their medical issues and needs not being sufficiently addressed within a standard 1:1 clinical consultation (Wadsworth et al., 2019). Beyond experience and satisfaction, there is also evidence that GMVs contribute to improved patient clinical outcomes, primary care access, and sense of community for these types of patients (Egger, 2018; Shibuya et al. 2018).

- Insufficient attention and frustration can often lead to these patients becoming high utilizers of the health system, contributing to both patient and provider dissatisfaction (Omogbai & Milner, 2018)
- GMVs improve access to primary care, clinical outcomes and satisfaction with care (Egger, 2018; Wong, 2016)
- GMVs help foster the “patient-centred medical home” (Egger 2018; Wadsworth et al. 2019)
- Randomized trials of GMVs have shown clinically significant improvements across a variety of medical, psychological and behavioural outcome metrics (Beck et al. 1997; Clancy et al. 2003a; Eisenstat et al. 2013; Kulzer et al. 2007; Trento et al. 2004; Wagner et al. 2001)
- Virtual GMVs mitigate patient costs associated with the travel required to attend the appointment, and can remove a potential barrier around accessing primary care.

Value to communities

Communities with elevated rates of chronic disease can particularly benefit from targeted GMV implementation, but benefits can go even deeper. Ariana Thompson-Lastad (2018) found that the social inequality that is often reproduced in healthcare for marginalized populations may be mitigated by changing the structure of the typical healthcare encounter, expanding access to care, as well as fostering ownership and community in receiving care. In several research studies, patients in such groups felt GMVs were a “better fit” than usual care, and that they promote trust and culturally competent care in minority populations (Egger, 2018; Pascual et al. 2019).

- Patients with historically stigmatized health conditions (HIV, hepatitis, obesity, mental health) have also shown significant benefits in peer group settings from open discussion of personal experiences and shared barriers (Hodges, 2019). Researchers have shown

significant potential for improvement in individuals with Hepatitis C Virus (HCV) in the context of a GMV. The model enabled open discussion, leveraging peer support by removing any stigma (Hodges, 2019)

- Gary Egger (2018) tested “programmed GMVs” and facilitator training with several Aboriginal and Torres Strait Islander men’s groups in Australia. Receiving both care and education in this format was found to be a better fit for these patients than usual care (Egger, 2018)
- US researchers found that a GMV program for Latin American pediatric patients and their families were overall very satisfied with the program’s structure. Parents and caregivers found the ability to connect with other parents and caregivers of children with T1DM who also shared the same culture and language improved their overall satisfaction, while improved clinical outcomes were reflected in decreased HbA1c levels and increased use of diabetes care technology (Pascual et al. 2019)

Value to health organizations

GMVs foster community connections, support activated patients and communities, encourage interprofessional collaboration, patient-centred care, and reduce overall health expenditures (Housden et al. 2018). Large, value-based US health organizations, including Mayo Clinic, Kaiser Permanente, Cleveland Clinic, Harvard Vanguard, and the US Veterans Administration, use GMVs to improve population health and patient and provider experiences while reducing overall costs (Omogbai & Milner, 2018; Shibuya et al. 2018).

- These US-based healthcare organizations reported fewer ER and outpatient visits, fewer visits to specialists and fewer hospitalizations costs after implementing GMVs (Omogbai & Milner, 2018; Shibuya et al. 2018)
- 385 GMVs were held over first two years of GMVs at Cleveland Clinic (2002-2004), whereas in 2017, over 12,000 were held, including 200 different types of GMVs (Shibuya et al. 2018)
- Upfront planning and training costs are theoretically mitigated over time by cost savings in reduced ED and outpatient visits, specialist visits and inpatient admissions
- By 2036, 25% of Canadians will be aged 65+ compared to 15% in 2015, further accelerating rising prevalence of complex comorbidities and related patient education needs

Virtual GMVs

Telemedicine and group medical visits each represent a significant innovation to the world of healthcare, and primary healthcare in particular. These contemporary tools are relatively new methods of delivering clinical services that have each been implemented and studied in clinical settings both within Canada and across the world. More recently, a marriage of these two innovations has been piloted, studied, and put into practice in numerous instances. While still in its relative infancy, early results have been promising, as the follow case studies will illustrate.

Virtual Care and Group Medical Visits – Feasibility and Outcomes

In a 2016 study conducted between the US territory of Guam and Honolulu, Hawaii, researchers sought to determine the feasibility of providing diabetes care to rural residents of Guam from a

Honolulu-based Veterans Administration hospital using a video conferencing technology-assisted shared medical appointment format, or what researchers termed a video-SMA (Tokua & Lorenzo, 2016).

Researchers sought to address the biggest challenges associated with delivering health services to rural areas – geographic and social isolation. By employing telemedicine technology, geographic constraints and travel burdens were significantly reduced, and by employing a model of shared appointments, patients became less socially isolated and more connected. This was particularly noted during the group interaction as facilitators used group dynamics to promote observational and experiential learning, fostering better self-efficacy and diabetes-related self-management skills among their client-base (Tokua & Lorenzo, 2016).

The collaborative nature of the video-SMA format particularly emphasized optimizing each co-facilitator's respective practice scope, where "the pharmacist's emphasis was in medication management, adherence and side effects; while the nurse practitioners emphasis was on clinical signs and symptoms of comorbid conditions or complications of diabetes... test results... referrals to other clinical specialists," (Tokua & Lorenzo, 2016, p. 17). The study concludes that not only are video-SMAs feasible for diabetes care, video-SMA patient significantly reduced their A1C levels and ED visits over the course of the study compared to patients receiving the usual diabetes care in 1:1, in-person appointments (Tokua & Lorenzo, 2016). Moreover, providers and patients engaged in video-SMAs had greater satisfaction than those engaged in usual care (Tokua & Lorenzo, 2016).

Beyond measuring clinical outcomes, satisfaction and feasibility, researchers conducted focus groups with both patients and providers to gather discussion themes as qualitative outcomes from each of their perspectives and experiences with video-SMAs over the course of the study.

Patient Focus Group Themes

- 1) Overall satisfaction with the video-SMA experience
- 2) Patients feeling that the information provided was informative and personally beneficial
- 3) Improved awareness of the importance of social support in diabetes
- 4) Improvement in self-efficacy to perform self-care behaviours
- 5) Increased concern over health & life expectancy
- 6) Satisfaction with the cultural competency of the video-SMA providers and use of culturally appropriate educational materials

Provider Focus Group Themes

- 1) Overall satisfaction with the video-SMA experience
- 2) Perceived benefits for their patients
- 3) Health system barriers to diabetes care and resolutions for these barriers
- 4) Effective video-SMA facilitation strategies and key elements

Treating obesity using virtual shared medical appointments

Obesity is a health condition that is highly correlated with many other chronic conditions, including diabetes, hypertension, heart disease, stroke and cancer, as well as being associated with reduced mental health, quality of life, and longevity (Shibuya & Pantalone, 2018). *Endocrine Practice* noted

in a recent article that although obesity needs to be continually addressed in the medical setting for treatment to be effective, such treatment has largely been obstructed by insufficient provider time, and that a potential solution to this is using shared medical appointments (SMAs) (Shibuya & Pantalone, 2018). The authors went on to describe how obesity SMAs at their institution went about addressing the issue by providing 8-10 patients with 90-minute appointments co-facilitated by a registered dietician and an obesity specialist with prescribing privileges.

Having addressed the issue of insufficient time with providers to strong, positive reception from patients and providers, the researchers described their next innovation – to make these appointments more accessible. Offering SMAs as ‘virtual visits’ through secure video-conferencing software has enabled patients who had difficulty staying engaged due to schedule conflicts and travel time to attend virtual SMAs in a quiet space using their mobile device, tablet or personal computer (Shibuya & Pantalone, 2018).

Importantly, the study found comparable weight loss percentages at the 3-month and 6-month marks for both in-person SMAs and virtual SMAs – indicating that both models of care are practical tools in delivering obesity care and treatment, depending on the patient (Shibuya & Pantalone, 2018).

Transitioning pediatric cancer survivors to adult primary care

In a pilot study of a novel concept, researchers sought to establish a model of shared care between pediatric oncology and adult primary care to address existing gaps in transitioning to adult primary care for pediatric cancer survivors. Despite strong consensus in the medical community regarding the importance of transitioning pediatric patients to adult primary care, particularly for patients with diabetes, sickle cell anemia, or who are post-organ transplant, there exists a paucity of rigorous evidence or studies to facilitate the process or assess existing transition programs (Raymond, 2017).

Lacking any standard models of transition, pediatric cancer survivors and their providers are regularly faced with inconsistent chronic disease expertise and experience among adult primary care providers (Raymond, 2017). The result of this pilot study was that both childhood cancer survivors and primary care providers found the experience to be of benefit to both of them, with survivors reporting increased trust and confidence in their adult primary care providers, and adult primary care providers reporting increased comfort and ability to care for survivors (Raymond, 2017).

CoYoT1 Clinic Model – Pilot Study

In 2016, medical researchers at the University of Colorado sought to develop a model for chronic disease management (CDM) specifically for young adults with type 1 diabetes (T1DM), recognizing that this population struggles with diabetes management, as evidenced by poor outcomes from suboptimal glycemic control and lack of primary care follow-up (Raymond et al. 2016). The reasons for these poor outcomes were largely attributed by researchers to competing academic, professional and social priorities among young adults, a lack of routine or regular changes in routine, and reduced support in cases where the youth has moved away from home, often including losing connection with one’s pediatric primary care provider as one transitions to adult primary care and/or moves to a new locale (Raymond et al. 2016).

To address these causal factors that result in poor CDM and glycemic control, Raymond and colleagues sought to design a model of care, using two previous innovations in care delivery, that is engaging, provides comprehensive intervention as needed, improves follow-up rates, and provides peer support.

- 1) Telemedicine technology has had success in engaging young adults in attending routine appointments for their diabetes management, resulting in improved access, self-management and glycemic control.
- 2) Group appointments have been shown to improve provider and patient satisfaction, clinical outcomes and also increase rates of follow-up across numerous patient populations

By incorporating two key innovations into their approach – telemedicine technology and group appointments – researchers established a model of care that is both feasible and acceptable to young adults – the Colorado Young Adult with Type 1 Diabetes Clinic structure (CoYoT1 Clinic). The CoYoT1 Clinic (pronounced like ‘coyote’) is the first telemedicine clinic using a group visit model to exist both in research and in practice.

Beyond confirming feasibility and acceptability among young adult patients in its pilot study, the researcher found the CoYoT1 Clinic model resulted in high levels of patient and provider satisfaction, follow-up rates of near 100%, and successful clinical data collection from the youth patients. The latter outcome was largely attributed to enabling patients to download clinical data directly from their diabetes device to the secure virtual connection, enabling providers to access and review the same clinical data in real time during the CoYoT1 Clinic (Raymond et al. 2016; Raymond, 2017).

CoYoT1 Clinic Model – Impact, Sustainability and Adaptability

Further research has been conducted on the CoYoT1 Clinic model since its pilot study. In 2018, Mark Reid and colleagues evaluated the efficacy of the CoYoT1 Clinic in improving treatment adherence and depressive symptom regulation among youth with T1D (Reid et al. 2018). Their conclusion was that by promoting clinic attendance, the model may improve regulation of depressive symptoms in young adults living with T1D (Reid et al. 2018).

Two studies evaluated the CoYoT1 Clinic model from a cost-perspective – the first in 2018 conducted an economic evaluation on CoYoT1, the second in 2019 evaluated CoYoT1’s societal cost-effectiveness (Wan et al. 2018, 2019). The economic evaluation found that long-term implementation of CoYoT1 would result in patients maintaining a higher quality of life as well as saving overall health costs via significantly reduced hospitalizations and primary care visits for those patients (Wan et al. 2018). The cost-effectiveness analysis determined that CoYoT1 patients maintained a higher quality of life than those receiving usual care with no cost increase between groups. The takeaway from these studies is that the CoYoT1 Clinic model is a safe and efficient method to provide healthcare to youth living with T1D (Wan et al. 2019).

In 2020, researchers sought to determine how generalizable and adaptable the CoYoT1 Clinic model was beyond the demographics of the state of Colorado. This new study targeted minority young adults in a low socioeconomic status (SES) community at public children’s hospital in urban California (Raymond et al. 2020). Researchers succeeded in adapting the CoYoT1 model using

survey data from young adults in California, focus groups from health teams in California, and a patient advisory board including young adults with T1D living in California (Raymond et al. 2020).

Beyond these results, the researchers also established this study as a randomized control trial (RCT) that both assessed the model's efficacy and will also serve to facilitate CoYoT1 model scaling in future research (Raymond et al. 2020). This supported the researchers' goals of enabling larger-scale RCTs evaluating the CoYoT1 Clinic model in the future, enabling the CoYoT1 Clinic model to be adapted for patients and families in different age groups, and reducing psychological comorbidities commonly associated with T1D (depression, distress) by addressing the symptom-exacerbating solitude experienced by many patient living with a chronic disease (Raymond et al. 2020).

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