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Recommendations for Integrating Physical Therapy into an Interprofessional Outpatient Model of Care for People Living with HIV: A Qualitative Study

Heather deBoer¹, Stephanie Cudd¹, Matthew Andrews¹, Ellie Leung¹, Alana Petrie¹, Soo Chan Carusone², and Kelly K. O'Brien^{1,3,4§}

¹ Department of Physical Therapy, University of Toronto, Toronto, Canada

² Casey House, Toronto, Canada

³ Rehabilitation Sciences Institute (RSI), University of Toronto, Toronto, Canada

⁴ Institute of Health Policy, Management and Evaluation (IHPME), University of Toronto, Canada

§ Corresponding author: Kelly K. O'Brien

Department of Physical Therapy

160-500 University Avenue

Toronto, Ontario M5G 1V7

Canada

Phone: 1-416-978-0565

Email: kelly.obrien@utoronto.ca

E-mail addresses of authors:

HDB: heather.deboer@mail.utoronto.ca

SC: stephanie.cudd@mail.utoronto.ca

MA: mt.andrews@mail.utoronto.ca

EL: ely.leung@mail.utoronto.ca

AP: alana.petrie@mail.utoronto.ca

SCC: schancarusone@caseyhouse.ca

KKO: kelly.obrien@utoronto.ca

Keywords: HIV/AIDS, physical therapy, rehabilitation, ambulatory, outpatient

1 2 3 1 **ABSTRACT** 4 5 2

6 3 **Objectives:** To determine factors to consider when implementing physical therapy (PT) into an
7 4 outpatient interprofessional model of HIV care from the perspective of health care professionals
8 5 and adults living with HIV.

9 6 **Design:** We conducted a qualitative descriptive study using semi-structured interviews (health
10 7 care professionals) and focus groups (adults living with HIV). We asked participants their
11 8 perspectives on strategies, barriers and facilitators to accessing and participating in outpatient
12 9 PT, characteristics of physical therapists working in outpatient HIV care, content and structure of
13 10 PT delivery, and program evaluation.

14 11 **Setting:** We purposively sampled health care professionals based on their experiences working
15 12 in interprofessional HIV care and recruited adults with HIV via word of mouth and in
16 13 collaboration with an HIV-specialty hospital in Toronto, Canada. Interviews were conducted via
17 14 Skype or in-person and focus groups were conducted in-person at the HIV-specialty hospital.

18 15 **Participants:** 12 health care professionals with a median of 12 years experience in HIV care,
19 16 and 13 adults living with HIV (11 men and 2 women) with a median age of 50 years and median
20 17 of 6 concurrent health conditions in addition to HIV participated in the study.

21 18 **Results:** Overall impressions of PT in outpatient HIV care and factors to consider when
22 19 implementing PT in outpatient interprofessional HIV care include: promoting the role of, and
23 20 evidence for involving PT as part of an outpatient model of care, structuring PT delivery to
24 21 accommodate the unique needs and priorities of people living with HIV, working collaboratively
25 22 with a physical therapist on the health care team, and evaluating rehabilitation as an
26 23 interprofessional model of care.

27 24 **Conclusions:** Multiple factors exist for consideration when implementing PT in an
28 25 interprofessional outpatient model of HIV care. Results provide insight for integrating timely and
29 26 appropriate access to evidence-informed rehabilitation for people living with chronic and
30 27 episodic illness, such as HIV.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- To our knowledge, this is the first study to explore the role of and factors to consider when implementing physical therapy in an interprofessional outpatient model of HIV care.
- Exploring perspectives from adults living with HIV and health care professionals using multiple methods of data collection (focus groups and interviews) enabled us to gather perspectives and recommendations from a diverse stakeholder group involved in accessing and delivering HIV care to develop recommendations for integrating physical therapy into an interprofessional outpatient model of care.
- Health care providers and those involved in program development can use results from this study when developing or adapting interprofessional outpatient programs for adults living with HIV and multimorbidity.
- This study was completed in collaboration with a specialty HIV hospital in an urban Canadian setting and therefore, results may not be generalizable to low to middle income countries or rural or remote areas.
- This study specifically focuses on an interprofessional outpatient program for adults living with HIV; further study is necessary to determine the relevance of results to similar populations such as those living with other chronic conditions and multimorbidity.

49 INTRODUCTION

50 Due to health care advances and improvements in combination antiretroviral therapy, people
51 living with HIV are experiencing increased life expectancy and chronicity of aging and
52 multimorbidity.¹⁻³ Compared to the general population, people with HIV had increased
53 prevalence of mental and physical medical diagnoses, as well as multimorbidity, defined as the
54 presence of several chronic conditions.⁴ Many people living with HIV experience disability,
55 defined as fluctuations in health, including physical, cognitive, mental or emotional symptoms
56 and impairments, difficulties carrying out day-to-day activities, challenges related to social
57 inclusion and uncertainty about future health.⁵ Rehabilitation, including physical therapy (PT),
58 has a role in managing and minimizing the spectrum of disability experienced by people living
59 with HIV.⁶ We recently described the role of PT in addressing physical, psychological and social
60 aspects of health. Results of this qualitative study indicated the role of PT in HIV care is
61 multidimensional and client-centered and should consider several contextual factors which have
62 an impact on care.⁷ Evidence supports the role of PT in enhancing functional mobility,⁸ pain
63 management,⁹ peripheral neuropathy¹⁰ and the role of rehabilitation interventions with older
64 adults living with HIV and complex comorbidities.^{11,12} Other evidence specifically demonstrated
65 the benefits of specific exercise interventions among adults living with HIV.^{13 14}

66
67 Despite evidence supporting the benefits, few people with HIV access PT services.¹⁵ Barriers to
68 accessing PT among adults living with HIV include lack of available services, stigma, lack of
69 knowledge of health care professionals and finances.¹⁶ As HIV transitions from a palliative to a
70 chronic illness, novel approaches to PT care delivery may help to overcome barriers accessing
71 PT for people living with complex chronic illness. Authors of a South African study advocated
72 for home- and community-based PT in order to address financial barriers and mobility
73 limitations.¹⁷ A study from the United Kingdom investigated a physical therapist supervised
74 rehabilitation class available to inpatients and outpatients, which provided HIV education and
75 exercise to address clients' goals.¹² An interprofessional day health program for people with HIV
76 in Vancouver, Canada, operational since 1997, does not include PT in the model of care
77 delivery.¹⁸ Casey House, a specialty hospital in Toronto, Canada, opened a day health program in
78 2017 with the goal of improving access and coordination of interprofessional health services for

79 people living with HIV.¹⁹ To our knowledge, this is the first to include PT services and offers a
80 foundation for considering rehabilitation as part of an outpatient model of HIV care.

81
82 In a recent qualitative study, we identified eight contextual factors important to consider in
83 interprofessional HIV care from the perspective of people living with HIV and health care
84 professionals with experience in HIV care that include: aging, episodic nature of HIV,
85 multimorbidity, competing priorities, continuity of care, stigma, resource security and social
86 isolation.⁷ These factors are complex and important to consider as evidence to inform how to
87 best integrate PT within a model of HIV care. Interprofessional care is valuable for the provision
88 of coordinated, comprehensive HIV care.²⁰⁻²² However, specific recommendations for how to
89 integrate PT are currently lacking. Hence, the purpose of this study was to determine factors to
90 consider in the implementation of PT in the context of an outpatient interprofessional model of
91 care for adults living with HIV from the perspective of health care professionals and people
92 living with HIV.

93 **METHODS**

94 **Study design**

95 We conducted a qualitative descriptive study comprised of interviews with health care
96 professionals and focus groups with adults living with HIV.²³ This study was approved by the
97 University of Toronto HIV/AIDS Research Ethics Board (Protocol Reference #33760). In this
98 study, we used the day health program at Casey House in Toronto, Ontario as an exemplar to
99 focus on factors to consider when integrating PT into an interprofessional outpatient service for
100 adults living with HIV.^{7 19}

101 **Recruitment**

102
103 We recruited health care professionals who self-identified as experts in the care of people living
104 with HIV from Canada and the United Kingdom (UK). Health care professionals were defined as
105 health providers who are registered or voluntarily designated by a governing body. Using
106 purposive sampling, we recruited rehabilitation professionals from the Canada-International HIV
107 and Rehabilitation Research Collaborative (CIHRRC) to ensure we obtained perspectives from a
108 variety of professionals with experience in HIV care in interprofessional hospital and community
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3 110 based settings.²⁴ We recruited adults 18 years or older who self-identified as living with HIV via
4 111 posters and word of mouth by Casey House clients and staff. Members of the research team
5 112 identified themselves to potential participants as students in the Department of Physical Therapy
6 113 at the University of Toronto who were advised by advisors throughout the research (KKO and
7 114 SCC). A member of the research team obtained written or verbal informed consent from each
8 115 participant immediately prior to each interview or focus group.
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117 **Data Collection**

118 We developed semi-structured interview (health care professionals) and focus group (adults
119 living with HIV) guides to explore considerations when implementing PT into an
120 interprofessional outpatient model of care for adults living with HIV, using the Casey House day
121 health program as an exemplar. A community member living with HIV with research expertise
122 provided feedback on drafts of the interview and focus group discussion guides. Guiding
123 questions were devised to explore perspectives in the following areas: strategies of how to enable
124 access to an outpatient PT program for people living with HIV, barriers and facilitators to adults
125 living with HIV participating in an outpatient PT program, characteristics of physical therapists
126 that are important for working in outpatient HIV care, recommendations for content and structure
127 of PT sessions in order to accommodate the unique needs and priorities of people living with
128 HIV, and how to evaluate the PT program in the context of an outpatient, interprofessional
129 model of HIV care. We revised the interview guide five times and the focus group guide once
130 during the course of data collection to improve clarity of the questions and address specifics
131 around evolving codes.⁷
132

133

133 We conducted and audio-recorded 12 face-to-face or Skype interviews with health care
134 professionals and two focus groups at Casey House with adults living with HIV. Two research
135 team members were present for each interview, and three were present for each focus group.
136 One team member facilitated the interview (MA, SC, HD, AP) or focus group (MA) and others
137 assisted with obtaining consent and documenting field notes (MA, SC, HD, EL, AP). We
138 collected data either verbally post interview (health care professionals) or via a self-administered
139 questionnaire (adults living with HIV) to understand participant demographics, disease
140 characteristics and experiences working in HIV care (health care professionals) and experiences

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3 141 with PT (adults living with HIV). Interview and focus group audio recordings were transcribed
4 142 verbatim and reviewed for accuracy. Further details on our methodology are published
5 143 elsewhere.⁷
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10 145 **Data Analysis**

11 146 We initially read the transcripts independently and noted context and first impressions.²⁵ We then
12 147 used a conventional content analytical approach to code transcripts.²⁶ Data were organized using
13 148 NVivo V10 software.²⁷ All members of the team independently read and coded five of the same
14 149 transcripts (three interviews and two focus groups), and met seven times to discuss overall
15 150 impressions, coding, and adaptations to guides for subsequent data collection. We developed a
16 151 draft coding scheme based on the first four team-coded transcripts (two interviews and two focus
17 152 groups) and ensured coding consistency with an additional team-coded interview. Pairs of two
18 153 team members (HDB, MA, SC, EL, AP) independently coded the remaining transcripts and met
19 154 to discuss coding and resolve discrepancies.⁷ We identified common responses and terms in
20 155 transcripts, and then grouped related codes into themes to highlight recommendations for
21 156 integrating PT into an interprofessional outpatient model for people living with HIV. We defined
22 157 each theme as it related to our study objective and organized the themes to clearly describe
23 158 participant views and perspectives.²⁸ We analyzed categorical demographic variables using
24 159 frequencies and percentages and continuous demographic variables using interquartile ranges
25 160 (IQR).
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39 162 **RESULTS**

40 163 Twenty-five individuals participated in an interview (12 health care professionals) or a focus
41 164 group (13 adults living with HIV) of approximately 30-90 minutes between January and May
42 165 2017. Nine practiced in Canada and half (50%) were rehabilitation professionals (occupational
43 166 therapist or physical therapist) and the others included a nurse, pharmacist, recreation therapist,
44 167 social worker, physician and massage therapist. The health care professionals reported a median
45 168 of 12 (IQR 8,16) years of experience working with people living with HIV and a median of 9
46 169 years (IQR 4, 12) working in a community setting, defined as care provided to people living with
47 170 HIV outside of a hospital. Table 1 summarizes the characteristics of the focus group participants
48 171 living with HIV. The majority of adults living with HIV were men (85%) and self-reported living
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172 with a median of six (IQR 3, 13) concurrent health conditions in addition to HIV. Approximately
 173 one third (36%) of participants living with HIV had no access to provincial social assistance or
 174 extended health benefits. Nine (82%) were current clients of Casey House and most (91%)
 175 reported being interested in attending a day health program for people living with HIV.

176

177 **Table 1. Participant Characteristics: Adults living with HIV^a**

Characteristic	Number of participants	Percentage of Participants
Gender		
Man	11	85%
Woman	2	15%
Age (years), median (IQR)		
	50 (47, 55)	
Current marital status		
Single	8	73%
Widowed	2	18%
Currently working or volunteering		
	3	27%
Self-reported health		
Excellent	2	18%
Good	2	18%
Fair	5	45%
Poor	1	9%
Average gross yearly income before tax		
Less than \$10,000 CAD	1	9%
\$10,000 to less than \$20,000 CAD	3	27%
\$20,000 to less than \$30,000 CAD	5	45%
\$60,000 to less than \$70,000 CAD	1	9%
Prefer not to answer	1	9%
Extended medical benefits coverage status		

No medical insurance benefits other than provincial health care	4	36%
Benefits through a provincial social assistance plan	3	27%
Extended medical insurance coverage through work	1	9%
Other ^b	3	27%
<hr/>		
Year of HIV diagnosis, median (IQR)	1997 (1995, 2002)	
<hr/>		
Currently taking HIV antiretroviral therapy	9	82%
<hr/>		
Viral load undetectable	7	64%
<hr/>		
Number of self-reported concurrent health conditions (in addition to HIV), median, (IQR)	6 (3, 13)	
<hr/>		
Commonly self-reported concurrent health conditions ^{cd}		
Muscle pain	7	64%
Dental problems	6	55%
HIV wasting syndrome	6	55%
Joint pain	6	55%
Mental health condition	6	55%
<hr/>		
Experience with Physical Therapy		
Currently seeing a physical therapist	3	27%
Saw a physical therapist in the past year	6	55%
Never saw a physical therapist	2	18%
<hr/>		
Commonly reported reasons for seeing physical therapist ^{cd}		
HIV or the side effects of treatment	8	73%
Other health conditions	7	64%
Physical health challenges	6	55%
Challenges carrying out day-to-day activities	6	55%
To help get back to leisure or recreational activities	5	45%

178 **Legend:** IQR: interquartile range; CAD: Canadian dollars;

179 ^a 11 of 13 adults living with HIV completed the demographic questionnaire (note: denominators may vary
180 dependent on the number of participants who responded to each item in the questionnaire);

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3 181 ^bother funding included status card (government ID card for which some Indigenous peoples are eligible,
4 182 and which provides some extended health coverage) and unspecified;
5 183 ^creported by 5 or more participants;
6 184 ^dparticipants were asked to identify all applicable answers.
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10 186 We present overall impressions of PT to provide context, followed by factors to consider when
11 187 implementing PT in an outpatient interprofessional model of care using the following themes:
12
13 188 promoting the role of and evidence for PT as part of an outpatient model of HIV care, structuring
14
15 189 the PT mode of delivery to accommodate the unique needs and priorities of people living with
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17 190 HIV, working collaboratively with a physical therapist on the health care team, and evaluating
18
19 191 rehabilitation as a component of an interprofessional HIV care. We integrated perspectives of
20
21 192 both health care professionals with expertise in HIV care and people living with HIV to best
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23 193 represent recommendations for implementing PT as part of an outpatient, interprofessional
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25 194 model of care. Health care professionals are described as either rehabilitation professionals
26
27 195 (physical therapist or occupational therapist) or other health care professionals throughout.
28

29 196
30 197 **Impressions of Physical Therapy in Outpatient HIV Care**
31 198 Participants living with HIV expressed perceived benefits of having access to PT in an outpatient
32 199 model of care:
33

34 200
35 201 *“When I walk, I’m not quite as strong as I used to be. I need to be careful when I walk.*
36 202 *Physiotherapy, I think, will open up a whole new avenue for me and give me more*
37 203 *confidence and actually, walking from A to B.” - Person living with HIV - P7 (man)*
40

41 204
42 205 Another participant described how having quick access to PT may be beneficial to those
43 206 experiencing acute challenges related to self care, housing or mobility:
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45 207

46 208 *“I think that might be a good idea, rapid access, someone coming in off the street who is*
47 209 *HIV positive having a hard time walking, or, you know, not quite taking care of themselves,*
48 210 *that can see someone fairly quickly, talk to them and maybe, you know, get some kind of*
49 211 *physiotherapy.” – Person Living with HIV – P1 (man)*
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3 213 One participant spoke about his challenges accessing PT in the past, attributed to having to pay out
4 214 of pocket for services. He described how universal access to PT as part of an outpatient day health
5 215 program could offer intermittent needs-based access to rehabilitation:
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9

10 217 *“I just didn’t follow it [physical therapy] through because of the problem with paying and*
11 218 *getting reimbursed. But if there was something like the day program and I could have*
12 219 *accessed one appointment every 2 or 3 weeks I would have probably tended to the problem.*
13 220 *The way it was I didn’t do anything about it.” – Person living with HIV - P6 (man)*
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18 221
19 222 Health care professional participants described how an outpatient interprofessional model of care
20 223 offered the potential to “pull in those people who are reluctant to engage elsewhere” and “fill a
21 224 big gap in the clinical and psychosocial care of our patients”. One rehabilitation professional
22 225 discussed the value of a specialized outpatient model of care in this population:
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26

27 227 *“Why can't they [people living with HIV] access a musculoskeletal outpatient service or*
28 228 *neuro outpatient service or general sort of physio clinics?... for some people living with*
29 229 *HIV, where their disease is well controlled, they're not having social problems, mental*
30 230 *health problems, that may well be true... but there's a fairly big proportion of people, or*
31 231 *certainly a reasonable community of people living with HIV who have complex care*
32 232 *morbidities and I think it's those people that really need... special services.” -*
33 233 *Rehabilitation professional - P11 (United Kingdom)*
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41 235 Health care professionals suggested that an outpatient interprofessional model of care has
42 236 potential to address gaps in the health care system by incorporating programs and services, such
43 237 as PT that are non-existent or are inaccessible to people living with HIV:
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47

48 239 *“Because once you’re out the door in our health care system, you’re on your own. So the*
49 240 *more guidance we give them [people living with HIV], the more education, the better.*
50 241 *With our patients, a lot of issues come up because of their cognitive impairment, so even*
51 242 *if they’re told some things, they need constant reminders about how to take care of*
52 243 *themselves.” - Other health care professional - P3 (Canada)*
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5 245 **Factors to Consider when Implementing Physical Therapy in Outpatient Interprofessional**
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7 246 **HIV Care**

8 247 In order to adequately address the complexity of HIV care in a practical setting, we identified
9
10 248 four themes regarding the implementation of PT into an outpatient interprofessional model of
11
12 249 care: 1) promoting the role of, and evidence for PT in an outpatient HIV clinical setting and
13
14 250 model of care; 2) structuring the PT mode of delivery to accommodate the unique needs and
15
16 251 priorities of people living with HIV; 3) working collaboratively with a physical therapist on the
17
18 252 health care team; and 4) evaluating rehabilitation as a component of interprofessional care.
19
20 253

21 254 ***1) Promoting the Role of, and Evidence for Physical Therapy in an Outpatient Clinical***
22 255 ***Setting***

23
24 256 *Role of Physical Therapy*

25
26 257 Participants described the role of PT within an outpatient model of care involving physical,
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28 258 psychological and social aspects of health and including both health promotion and
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30 259 rehabilitation. Many participants living with HIV viewed the role of PT as synonymous with
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32 260 exercise, stating that PT in an outpatient interprofessional model of care would provide an
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34 261 opportunity to “*get help with exercises*” and engage in “*exercise together [with peers] or go*
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36 262 *walking together*”. In addition, people living with HIV suggested PT could enhance social
37
38 263 engagement and provide a venue to build the strength and functional ability to “*actually get up*
39
40 264 *and begin to return to going to a theatre*”.

41 265
42 266 Health care professional participants similarly referred to the role of PT within an outpatient
43
44 267 interprofessional service similarly in a physical context such as “*cardiorespiratory, progressive*
45
46 268 *resistance training, neuromotor exercises*” and “*balance... falls prevention*”, as well as
47
48 269 psychological and social aspects including “*motivation, inspiration, structure, meaning*” and
49
50 270 taking a creative approach in order to “*find an activity that actually motivates someone*”. Health
51
52 271 care professional participants also viewed physical therapists as having a role in “*education*” and
53
54 272 “*preventative health*” such as “*falls prevention*”, “*secondary complications*” and “*pain*”.

55 273

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3 275 Promoting Physical Therapy in an Outpatient Interprofessional Model of Care

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5 276 Community and hospital-based health professionals noted the importance of information sharing
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7 277 between HIV clinics in the city and an outpatient service (day health program). They suggested
8
9 278 that it was valuable for physical therapists to visit clinics and to present at rounds in order to
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11 279 inform the health care community about the role and evidence in addressing disability and
12 280 promoting healthy aging with HIV, as well as practically how to access services for their clients:
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14 281

15 282 *“Every HIV clinic actually has some kind of rounds. A good way of promoting is to... offer*
16
17 283 *just to do a rounds either what is being offered at [Name of site] or on a topic, on a physio*
18
19 284 *related topic so what’s new in treating or what’s new in arthritis and HIV... you get to*
20
21 285 *educate somebody but also are plugging the services at the same time.” Other health care*
22 286 *professional - P6 (Canada)*
23

24 287

25
26 288 Another health care professional participant, with experience working in an HIV-specific health
27
28 289 centre discussed using social media, specifically involving the experiences of clients to raise
29
30 290 awareness of PT and provide practical information about what PT is, and how services available
31 291 can be accessed in an outpatient model of care:
32
33 292

34 293 *“Always use social media. I think have a Twitter account, have a Facebook page, have a*
35
36 294 *YouTube video of what physiotherapy at [Name of site] is. Those sort of things are*
37
38 295 *important because then if you’ve got a really engaging video that has a physiotherapist*
39
40 296 *and a service user in it saying this is what physiotherapy is, this is the services we offer,*
41
42 297 *this is what happens when you come and then someone giving their personal experience*
43 298 *of attending, that will make the world of difference.” Rehabilitation professional - P10*
44
45 299 *(United Kingdom)*
46
47 300

48 301 Staffing and Support

49
50 302 Participants noted the role members of the health care team play in creating a welcoming
51
52 303 environment. They indicated personal traits that would be useful for physical therapists to
53
54 304 possess in order to facilitate engagement in PT such as “warmth”, “adaptable”, “non-
55 305 judgemental” and possessing “broad knowledge [of cardiovascular, neurological and

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2
3 306 *musculoskeletal physical therapy-related specialties and rehabilitation for people living with*
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5 307 *HIV and marginalized populations]”.*
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7 308

8 309 People living with HIV and health care professional participants explained the importance of
9
10 310 having a physical therapist who has experience in HIV care, and understands the physical, social
11
12 311 and psychological complexities of living with HIV.
13
14 312

15 313 *“I saw a physiotherapist, and ... she didn't understand HIV, which is fine, ...she was like,*
16
17 314 *‘oh I've never seen somebody so young be so weak, I usually work with senior citizens’,*
18
19 315 *and just made me really feel like an alien, that it was like, ‘I don't even want to work with*
20
21 316 *her anymore.’ And so that's why I'm kind of like, with something with [a specialty*
22
23 317 *hospital] you feel like people already understand HIV, you don't feel like you have to*
24
25 318 *give a lesson.” - Person living with HIV - P3 (woman)*
26
27 319

28 320 However, some participants did not feel all PT services offered to people living with HIV needed
29
30 321 to be HIV-specific or focused in nature. Some suggested partnering with other community health
31
32 322 and social service-focused programs, which are not HIV-specific to provide adults living with
33
34 323 HIV additional options to address their episodic disability, not only aging with HIV but other
35
36 324 potential multimorbidity such as issues related to mental health or chronic pain:
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38 325

39 326 *“I think it's important that there is available knowledge on what other services can be*
40
41 327 *referred to because not everybody wants to come to a HIV specific service. Just because*
42
43 328 *you're positive doesn't mean you have to engage in a positive program.” - Rehabilitation*
44
45 329 *professional - P10 (United Kingdom)*
46
47 330

48 331 People living with HIV participants suggested involving PT students on the health care team,
49
50 332 proposing that as an effective way of managing finances while mitigating stigma and providing a
51
52 333 source of valuable education for students.
53
54 334

55 335 *“It would be cheaper to have students to come as part of their program or schooling... I*
56
57 336 *think it would help open up the door to, uh, people who are afraid of communicating with*

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2
3 337 *HIV/AIDS... There is still stigma about HIV out there. I can only imagine what it is like,*
4
5 338 *going to school, thinking 'oh god, I am going to work with HIV clients, I don't want to*
6
7 339 *touch them, that sort of thing. But, get rid of the fear, educate yourself. Education is key-*
8
9 340 *and this would be part of education." - Person living with HIV - P1 (man)*

341

342 **2) Structuring the Physical Therapy Mode of Delivery to Accommodate the Unique Needs and** 343 **Priorities of People Living with HIV**

344 Welcoming Environment

345 Participants emphasized the importance of a “welcoming” environment including “*bright and*
346 *cheery colours*” to make it “*as much of a comfortable experience*” as possible. One health care
347 professional noted that people with HIV may be more likely to access PT in an outpatient
348 interprofessional model knowing that “*they can access more than one thing that's free*” in one
349 location. Participants suggested reminder phone calls can be beneficial in promoting attendance
350 for outpatient service appointments amid fluctuating health, various medical appointments and
351 scheduling:

352

353 *“I think that [an] appointment reminder is crucial for people like us who are inundated*
354 *with appointments.” Person living with HIV - P6 (man)*

355

356 Group vs Individual Sessions

357 Both health care professionals and people with HIV expressed the benefits of group PT exercise
358 and education sessions including peer support, motivation and cognition:

359

360 *“Peer-engaged support, you pair people up, ... we get to know each other, and you don't*
361 *create dependent links that emerge as you're doing physio... pair people, encourage*
362 *people, because then you forget a part of an exercise, and then my... peer remembers the*
363 *rest of it.” Person living with HIV - P12 (man)*

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365 However, both stakeholder groups also acknowledged the need for individualized PT sessions,
366 specifically for initial assessments prior to joining a group, for supervision and with an acute or
367 unique-needs client:

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5 369 *“One-on-one is really good if the client has really specific goals around walking or safety*
6 *or improving transfers... Group settings again have potential for group teaching or*
7 370 *exercise class and also has that opportunity to bring folks together and feel like a*
8 371 *community.” Other health care professional - P5 (Canada)*
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12 373

13 374 Structured versus Flexible Models of Physical Therapy Care

15 375 Participants recommended that scheduled appointments should be available, but noted that the
16
17 376 PT service would need to be flexible in order to facilitate access to people who may experience
18
19 377 episodic disability with many compounding factors presenting as barriers to access:
20
21 378

22 379 *“I think that having flexibility allows for options and allows for choices because living with*
23 *HIV you can have one day that’s great and the next is not so great because the condition is*
24 380 *episodic in nature. So it’s an episodic disability just like cancer, lupus, arthritis, MS that*
25 381 *sort of thing. Even with in the day you can be great in the morning by 10 o’clock and then*
26 382 *by 1 o’clock you’re not feeling that great.” Rehabilitation professional - P7 (Canada)*
27
28
29 383
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31 384

32
33 385 One health care professional participant described the benefits of a group-based approach
34
35 386 offering a flexible (drop-in) attendance schedule in his work setting:
36
37 387

38 388 *“We now have open access, which is, we have people attend, return or restart depending*
39 *on their own health and disability. So the open accessibility almost enables people to take*
40 389 *a bit more ownership over their health and they can engage in these things a bit more.*
41 390 *They create a little bit more autonomy about what is important for them in a supervised,*
42
43 391 *safe physiotherapy led environment.” Rehabilitation professional - P10 (United Kingdom)*
44
45 392
46
47 393

48 394 Goal-Oriented Interventions

49
50 395 Health care professional and people living with HIV participants expressed the need to engage in
51
52 396 meaningful PT programs that are relevant and tailored to clients’ goals, abilities, and preferences
53
54 397 within the context of their day-to-day lives:
55
56 398

1
2
3 399 *“It’s different when you’re in a controlled setting like that [clinical], as opposed to*
4 *walking the street on your own, so it’s sort of like a clinical versus a day to day therapy.*
5 400
6 *So even things like walking the sidewalks and learning how to not trip over things or*
7 401
8 402 *learning to go up your stairs.” Person living with HIV - P5 (man)*
9

403

11
12 404 One health care professional with experience working in an HIV outpatient setting emphasized
13 the importance of an intervention-focused approach tailored specifically to clients’ goals:
14 405

406

17 407 *“When we’re addressing what’s meaningful and important to the individual that we’re*
18 *treating, if they engage with the process and engage with physical therapy or*
19 408 *physiotherapy, we can achieve people’s goals and we know that the majority of their*
20 409 *goals are either body image concerns, participation in meaningful tasks, health and*
22 410 *fitness or mobility.” Rehabilitation professional - P10 (United Kingdom)*
24 411

412

27 413 One participant with HIV noted how participating in PT could allow individuals to feel a sense
28 of purpose in contributing to community:
29 414

415

32 416 *“...they [people living with HIV] get involved in the community and I know that there’s*
33 *people at this table that are working at the food bank, and the physiotherapy can give*
34 417 *them energy and extra strength and so with the physiotherapy... you are able to give back*
36 418 *to the community and I think that’s wonderful.” - Person living with HIV - P12 (man)*
38 419

420

41 421 In order to address clients’ individual goals and unique presentations, health care professional
42 participants suggested stratifying interventions. Practically, this could involve *“different groups*
43 422 *for people at different levels”* and a varying *“ratio”* of participants to support staff depending on
44 423 factors such as *“cognitive problems”*, *“comorbidities”*, *“age”*, and *“mood issues”*. One
46 424 rehabilitation professional participant noted:
48 425

426

51 427 *“We need to make sure that what we’re doing is... centred on the individual, so I think*
52 *that everybody who you see, you should do a thorough assessment and kind of work out*
53 428 *what their needs are.” Rehabilitation professional – P12 (United Kingdom)*
55 429

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4
5 431 One participant living with HIV described his concerns regarding the potential of a group that
6
7 432 was not the appropriate level:

8 433
9
10 434 *“If I’m in a group setting and they’re doing something that I find a bit difficult, I [want to*
11
12 435 *be] able to go to a one on one and learn how to do it without taking away time from*
13
14 436 *everyone else and learning for myself so I’m... secure enough in myself to know I can do*
15
16 437 *the move without toppling over or bothering something.” - Person living with HIV- P2*
17 438 *(man)*

18 439
19
20 440 Promoting Independence

21
22 441 One participant living with HIV identified that it can be *“very hard doing physiotherapy without*
23
24 442 *[a physical therapist] in your room, because she’ll come and make sure you exercise”* and
25
26 443 another suggested how to overcome this challenge:

27 444
28
29 445 *“The knee exercises you are doing in the studio or in the centre... record it for each*
30
31 446 *participant so that each participant has their own disc to take home and follow-through*
32
33 447 *because three days a week. Three days off, four days on. There are your instructions*
34
35 448 *there.” Person living with HIV - P13 (man)*

36 449
37
38 450 Health professionals with experience in HIV care described how PT resources and materials
39
40 451 should be adapted to maximize retention, independence and adherence to PT programs:

41 452
42
43 453 *“I think that ensuring if you are using any print material that you are using basic*
44
45 454 *language... Easy to access information. If material is in print, can our clients read it?...*
46
47 455 *Understanding that people might need to have the same session 2 or 3 times to retain that*
48
49 456 *session.” - Other health care professional - P5 (Canada)*

50 457
51 458 Sensitivity to Practice

52
53 459 People with HIV and health care professional participants noted the importance of physical
54
55 460 therapists to adopt approaches sensitive to the complexities faced by people with HIV including

1
2
3 461 the potential episodic nature of HIV, stigma, financial insecurity, and substance use associated
4
5 462 living with HIV. One participant emphasized the importance of a “safe space” addressing the
6
7 463 potential role in addressing stigma with HIV.
8
9 464

10 465 *“I think that one of the key things is that providing physiotherapy in a safe space... which*
11 *is a space which is maybe dedicated and specialized to people living with HIV... I think is*
12 *incredibly important for some people. I think some people want the opportunity to know*
13 *467 that even though they don't have to talk about HIV, if I want to talk about HIV in the*
14 *468 context of why I'm here, I'm not going to be judged, I'm not going to be stigmatized*
15 *469 against... I'm not going to encounter something negative. Rehabilitation professional –*
16 *470 P10 (United Kingdom)*
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22 472

23
24 473 Participants reported stigma as a barrier to accessing PT and suggested the first step in mitigating
25
26 474 stigma is to simply acknowledge its presence. They also suggested offering a variety of group
27
28 475 exercise classes for people with HIV who may identify with a certain culture or gender to ensure
29
30 476 sensitivity to diversity and mitigate stigma:
31
32 477

32 478 *“Certain cultures, men and women in the same room... partnering up and things like*
33 *479 that... also gender... the trans community as well... so it would be engaging them as*
34 *480 well.” Person living with HIV - P6 (man)*
35
36
37
38 481

39 482 People living with HIV and health care professional participants recognized substance use as a
40
41 483 barrier to participation in PT. One person with HIV suggested “a harm reduction framework
42
43 484 within the physiotherapy” as an aspect of program development which addresses the needs of
44
45 485 clients. Health care professionals noted concerns regarding the risk associated with allowing
46
47 486 clients who are using substances to participate in PT due to impaired balance, judgement and
48
49 487 potentially unstable vitals: “I certainly didn't feel safe to bring people in [to physical therapy]
50
51 488 who are on substances.”
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53 489
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57 491

3) Working Collaboratively with a Physical Therapist on the Health care Team

Team Communication

Participants recognized the importance of communication to streamline referrals and to discuss progress of clients within the team. Discussions with the health care team can help to clarify “*the triggers for referral... the threshold for referral and ... the appropriate pathway to facilitate engagement and accessibility*” within each area of specialty, including PT. The health care team should be knowledgeable of the other members of the team and services available to provide client-centered care. Some health care professional participants suggested regular meetings in which the team can discuss any concerns and specific clients which may be attending that day.

501

502 *“I think communication is the biggest thing, so if you can build tools upfront like weekly*
503 *meetings or even daily meetings... focusing on specific pieces of, like clinical issues that*
504 *are coming up then, you’re probably going to have more success in providing patient*
505 *care to people.” - Other health care professional - P4 (Canada)*

506

507 Some health professional participants suggested that PT may have a role in informing other
508 health practices in regard to transfers, pain, physical impairments and mobility for clients. One
509 health care professional participant who worked in an interprofessional setting described how the
510 team can reinforce PT recommendations so that clients can be best supported, using personalized
511 strategies and techniques in each environment:

512

513 *“They [physical therapists] could inform the work that I do, and... it would probably*
514 *inform what massage therapy does as well and what nursing does, it already informs*
515 *what nursing does, but I think more heavily...nursing - our nurses are great at*
516 *implementing the recommendations of physio.” - Other health care professional - P2*
517 *(Canada)*

518

Interprofessional Group Sessions

520 Some health professional participants suggested models of care delivery with interprofessional
521 sessions involving a physical therapist and another health professional, while others advised

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2
3 522 against it. One rehabilitation professional participant commented on the challenge of addressing
4 523 competing priorities in a joint session:

5 524
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7 525
8
9 526 *“When we have more than one professional in the clinic room at the time, completely*
10 527 *ineffectual. I did a joint clinic with a dietician, didn’t work. There’s too many people in*
11 528 *the room, too many factors to consider, too many competing issues for prioritizing what’s*
12 529 *important at the time.” - Rehabilitation professional - P10 (United Kingdom)*

13 530 However, another health professional commented on the potential benefits of a model that
14 531 involved interprofessional collaboration to facilitate a shared group program:

15 532
16
17 533 *“I would love to see a collaboration between physiotherapy and recreation therapy*
18 534 *around some sort of exercise groups in the future within the Day Health Program. That*
19 535 *would be something that I would- I think would be a really natural pairing and would*
20 536 *work really well.” - Other health care professional - P2 (Canada)*

21 537
22
23 538 Whether encouraging interprofessional groups or not, both health care professionals and
24 539 participants living with HIV recognized the importance of identifying common goals in order to
25 540 have an effective group session.

26 541
27
28 542 **4) Evaluating Rehabilitation as a Component of Interprofessional Care**

29 543 Many health care professional participants discussed the importance of evaluation to determine
30 544 the successes and challenges of implementing a new discipline such as PT in an outpatient model
31 545 of HIV care. The episodic nature of HIV, in addition to the complex physical, psychological and
32 546 social domains of health affected, necessitate a broad approach to program evaluation. One
33 547 health professional with many years of experience in HIV care reported:

34 548
35
36 549 *“It’s very difficult to find a uniform measurement tool to look at objective markers of*
37 550 *success with physical therapy in a heterogeneous population such as ...people with HIV.*
38 551 *Which is the problem we face, which is why the subjective tools and... measurements are*
39 552 *important. However, measuring success means measuring change over time and I think*

1
2
3 553 *that when you are looking at a condition that is episodic... I think it's important that we*
4
5 554 *look at a range of different things. So I think there needs to be a battery approach.” -*
6
7 555 *Rehabilitation professional - P10 (United Kingdom)*
8
9 556

10 557 Most health care professional participants suggested implementing a variety of evaluation
11
12 558 methods, focused on client goals to capture subjective and objective components of evaluation.
13
14 559

15 560 *“I think all evaluation needs to consider what the patient goals are, so to be less*
16
17 561 *weighted around program goals and maybe being more focused around patient goals that*
18
19 562 *might be one way to consider the evaluation.” - Other health care professional - P4*
20
21 563 *(Canada)*
22
23 564

24 565 One participant with HIV suggested evaluating PT as a new model of care should involve
25
26 566 “*weekly or monthly check-ins... just a couple of simple questions*” for people with HIV to
27
28 567 answer. Another suggested:

29 568 *“Once you start getting clients, like the ones that are seeing the physiotherapist, ask them*
30
31 569 *how its working and how they think it is going so you guys could know how everybody is*
32
33 570 *doing with it.” – Person living with HIV - P4 (woman)*

34 571 Overall, participants recognized the importance of focusing on the clients’ goals and perspectives
35
36 572 to effectively and rigorously evaluate the model of care.
37
38 573

39 574 **DISCUSSION**

40
41 575 To our knowledge this is the first study to explore factors to consider when implementing PT
42
43 576 into an outpatient interprofessional model of HIV care. The role of PT in HIV care is
44
45 577 multidimensional and client-centered.⁷ Our results recommending goal oriented and client-
46
47 578 centred PT align with those in a conceptual rehabilitation framework for people living with HIV⁶
48
49 579 and highlight the need for rehabilitation in outpatient settings to address prevention and healthy
50
51 580 aging concerns such as mobility and social engagement. In the evaluation of a physical therapist
52
53 581 led group rehabilitation program for people living with HIV in the UK, individualized goal-
54
55 582 setting was beneficial, as 83% of participants achieved or surpassed their goals.¹² Client-centered
56
57 583 HIV care should allow for flexibility to accommodate the potential episodic nature of HIV.

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3 584 Participants outlined barriers to accessing and engaging in PT, which stemmed from the chaotic
4 585 lifestyle some people with HIV experience related to substance use, stigma, financial security,
5 586 and basic needs (housing and food) in addition to the episodic nature of HIV. Brown and
6 587 colleagues minimized these barriers by designing a program where participants were not required
7 588 to attend weekly, but free to attend and restart as able.¹² Collectively our findings highlight the
8 589 evolving role of rehabilitation beyond tertiary care to that of primary and preventative care as a
9 590 mechanism for health promotion, prevention of multimorbidity, and healthy aging with HIV.

10 591
11 592 Participants discussed the importance of a physical therapist working in an outpatient program to
12 593 maintain communication with community HIV clinics ensuring health providers know what
13 594 services are offered and how to refer clients to PT. Studies with other chronic disease
14 595 populations including chronic heart failure and diabetes have shown that lack of interprofessional
15 596 communication is a barrier to providing optimal care.^{29 30} A qualitative descriptive study of
16 597 health care professionals after introducing an initiative to increase interprofessional
17 598 communication among professionals working with patients with heart failure found professionals
18 599 felt they had greater knowledge of heart failure, and patients had improved clinical outcomes.³¹
19 600 While the importance of interprofessional communication within an outpatient service is evident,
20 601 further research is needed to address how to optimize communication along the health care
21 602 continuum, particularly with episodic illness where the continuum may not always be
22 603 predictable, nor linear in nature.

23 604
24 605 Participants in this study noted the importance of making connections with non-HIV specific
25 606 intervention locales such as community-based PT and fitness centres in order to facilitate a
26 607 referral if clients prefer to seek treatment in a non HIV-specific setting. In a study examining
27 608 factors to consider when developing a community-based exercise program for people with HIV,
28 609 participants had preferences for avoiding an HIV specific program. Some felt people with HIV
29 610 were similar to the general population and could attend any program while others stated
30 611 attending an HIV program meant exposing themselves to the potential stigma associated with
31 612 HIV disclosure.³² A qualitative synthesis highlighted experiences of stigma within an HIV care
32 613 setting, including segregation of people with HIV, behaviours of health care professionals related
33 614 to fears of exposure, and perceived judgement from practitioners.³³ Fear of stigma attending an

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3 615 HIV outpatient clinical setting was evident among some participants in our study who expressed
4 616 preferences for an HIV-specific program due to beliefs that health providers would better
5 617 understand and be able to address their needs. Participants echoed benefits of social support,
6 618 such as group PT sessions and showed a desire to mitigate stigma by involving PT students in an
7 619 HIV-specific outpatient service. While our study provides some insight, further research and
8 620 initiatives are necessary to determine how to provide accessible health care for those
9 621 experiencing HIV-related stigma.
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17 623 Participants in this study were living with a median of six concurrent health conditions with 55%
18 624 reporting mental health concerns. Participants commented on challenges accessing health care
19 625 services for those who are living with HIV and actively using substances. These principles are
20 626 reflective of specific considerations related to sensitive practice when implementing PT
21 627 assessment and treatment sessions into an outpatient model of care. Interprofessional online
22 628 modules demonstrated utility for increasing education and awareness of rehabilitation for people
23 629 living with HIV among community organizations, people with HIV, as well as current and future
24 630 health care professionals.^{21 34 35}
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32 632 Limited evidence exists concerning integration of PT in outpatient interprofessional models of
33 633 care for populations with chronic health conditions. While care models are being developed to
34 634 better meet the health care needs of populations living with chronic conditions, specifically in
35 635 underserved areas,^{36 37} few involve PT. There is an opportunity for the HIV and rehabilitation
36 636 sector to learn from evidence supporting the importance of an interprofessional health care
37 637 model in other chronic illnesses including chronic obstructive pulmonary disease³⁸ and
38 638 fibromyalgia,³⁹ and in older adults living with multimorbidity.⁴⁰ For example, fibromyalgia and
39 639 clinics for older adults included a physical therapist, specifically as a consultant for education
40 640 regarding fatigue, pain and work³⁹ or falls prevention.⁴⁰ While participants in our study
41 641 recognized a role for PT in education, they also recommended seeing the physical therapist
42 642 regularly to receive feedback and progress and promote confidence in mobility. As many people
43 643 living with chronic health conditions such as chronic obstructive pulmonary disease,⁴¹ diabetes,⁴²
44 644 and osteoporosis⁴³ benefit from PT interventions, it will be valuable to consider
45 645 recommendations from this study in combination with other chronic condition models of care.
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647 In this study, we used a newly emerging day health program in Toronto, Canada as an exemplar
648 to establish recommendations for integrating PT into an interprofessional outpatient model of
649 care. We interviewed a variety of health care professionals from Canada and the UK to gain a
650 broad range of perspectives. Although few health professionals had experience with community-
651 based HIV care, all had years of experience working in HIV patient care and as such were
652 capable of speaking to the potential role of PT. Our aim was not to achieve saturation, but rather
653 to obtain a rich description of perspectives related to HIV PT care. Nevertheless we ceased data
654 collection with 25 participants, which we observed as the point when no new categories
655 emerged. As the recruitment for people living with HIV was done through an HIV-specialty
656 hospital in Toronto, our study population consisted of adults living with a median of six
657 comorbid conditions in addition to HIV and many who had accessed PT in the past year. Results
658 may not represent those living in rural areas or low to middle income countries who may have
659 distinct barriers to health care resources. Further research is necessary to investigate the potential
660 for cost-saving, client-centred interprofessional models of care which may be relevant in various
661 health systems and settings.

662

663 **CONCLUSION**

664 Multiple factors exist for consideration when implementing PT in an interprofessional outpatient
665 model of HIV care. Results provide insight into approaches for integrating timely and
666 appropriate access to evidence-informed rehabilitation for people living with chronic and
667 episodic illness, such as HIV.

668

669 **AUTHORS' CONTRIBUTIONS**

670 KKO (PhD) and SCC (PhD) designed the study and provided guidance throughout the research
671 process. KKO and SCC possesses expertise in qualitative methodology and HIV and exercise
672 research. KKO and SCC supervised HDB, SC, MA, EL and AP (MScPT students) who
673 developed the protocol, collected and analysed the data, and drafted the manuscript in partial
674 fulfillment of requirements for an MScPT degree at the University of Toronto. HDB, SC, MA,
675 EL and AP (MScPT students) developed skills in qualitative research methodology including

1
2
3 676 attending lectures; completing readings on qualitative research study design; understanding steps
4
5 677 of recruitment, data collection and analysis; completing a literature review; developing the
6
7 678 research protocol, interview guides, focus group guide and demographic questionnaire; and
8
9 679 considering the ethical issues associated with this research. All steps were closely reviewed and
10
11 680 guided by KKO and SCC (advisors). All authors read and approved the final manuscript.
12

681

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19
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23
24 687 recruitment and data collection.

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37 694 **COMPETING INTERESTS**

39 695 The authors have no competing interests to declare.

42 696 **ETHICS APPROVAL**

44 697 University of Toronto HIV/AIDS Research Ethics Board.

47 698 **DATA SHARING STATEMENT**

49 699 The data collected and analyzed during the study are not publicly available in accordance with
50
51 700 our study protocol that was approved by the University of Toronto HIV/AIDS Research Ethics
52
53 701 Board. Data may be available on reasonable request by contacting the corresponding author.

702 **REFERENCES**

- 703 1. Johs NA, Wu K, Tassiopoulos K, et al. Disability among Middle-Aged and Older Persons with
704 HIV Infection. *Clin Infect Dis* 2017;Jul 1;**65**(1):83-91. doi: 10.1093/cid/cix253
- 705 2. Deeks SG, Lewin SR, Havlir DV. The end of AIDS: HIV infection as a chronic disease.
706 *Lancet* 2013;**382**(9903):1525-33. doi: 10.1016/S0140-6736(13)61809-7 [published
707 Online First: 2013/10/25]
- 708 3. Antiretroviral Therapy Cohort Collaboration. Survival of HIV-positive patients starting
709 antiretroviral therapy between 1996 and 2013: a collaborative analysis of cohort studies.
710 *The lancet HIV* 2017;**4**(8):e349-e56. doi: 10.1016/S2352-3018(17)30066-8
- 711 4. Kendall CE, Wong J, Taljaard M, et al. A cross-sectional, population-based study measuring
712 comorbidity among people living with HIV in Ontario. *BMC public health*
713 2014;**14**(1):161.
- 714 5. O'Brien KK, Bayoumi AM, Strike C, et al. Exploring disability from the perspective of adults
715 living with HIV/AIDS: development of a conceptual framework. *Health Qual Life*
716 *Outcomes* 2008;**6**:76. doi: 1477-7525-6-76 [pii] 10.1186/1477-7525-6-76 [published
717 Online First: 2008/10/07]
- 718 6. Worthington C, Myers T, O'Brien K, et al. Rehabilitation in HIV/AIDS: development of an
719 expanded conceptual framework. *AIDS Patient Care STDS* 2005;**19**(4):258-71.
- 720 7. deBoer H, Andrews M, Cudd S, et al. Where and how does physical therapy fit? Integrating
721 physical therapy into interprofessional HIV care. *Disabil Rehabil* 2018:1-10. doi:
722 10.1080/09638288.2018.1448469
- 723 8. Cobbing S, Hanass-Hancock J, Deane M. Physiotherapy rehabilitation in the context of HIV
724 and disability in KwaZulu-Natal, South Africa. *Disabil Rehabil* 2014;**36**(20):1687-94.
725 doi: 10.3109/09638288.2013.872199
- 726 9. Pullen S. Physical therapy as non-pharmacological chronic pain management of adults living
727 with HIV: self-reported pain scores and analgesic use. *HIV/AIDS (Auckland, NZ)*
728 2017;**9**:177.
- 729 10. Kietrys DM, Galantino ML, Cohen ET, et al. Yoga for Persons Living with HIV-related
730 Distal Sensory Polyneuropathy: A Case Series. *Rehabilitation Oncology* 2018;**36**(2):123-
731 31.

- 1
2
3 732 11. O'Brien KK, Solomon P, Trentham B, et al. Evidence-informed recommendations for
4
5 733 rehabilitation with older adults living with HIV: a knowledge synthesis. *BMJ Open*
6
7 734 2014;**4**(5):e004692. doi: 10.1136/bmjopen-2013-004692 [published Online First:
8
9 735 2014/05/17]
- 10 736 12. Brown D, Claffey A, Harding R. Evaluation of a physiotherapy-led group rehabilitation
11
12 737 intervention for adults living with HIV: referrals, adherence and outcomes. *AIDS care*
13
14 738 2016;**28**(12):1495-505.
- 15 739 13. O'Brien KK, Tynan A-M, Nixon SA, et al. Effectiveness of aerobic exercise for adults living
16
17 740 with HIV: systematic review and meta-analysis using the Cochrane Collaboration
18
19 741 protocol. *BMC infectious diseases* 2016;**16**(1):182.
- 20 742 14. O'Brien KK, Tynan A-M, Nixon SA, et al. Effectiveness of Progressive Resistive Exercise
21
22 743 (PRE) in the context of HIV: systematic review and meta-analysis using the Cochrane
23
24 744 Collaboration protocol. *BMC infectious diseases* 2017;**17**(1):268.
- 25 745 15. Worthington C, Myers T, O'Brien K, et al. Rehabilitation professionals and human
26
27 746 immunodeficiency virus care: results of a national Canadian survey. *Arch Phys Med*
28
29 747 *Rehabil* 2008;**89**(1):105-13. doi: S0003-9993(07)01661-9 [pii]
30
31 748 10.1016/j.apmr.2007.10.009 [published Online First: 2008/01/01]
- 32
33 749 16. Worthington C, O'Brien K, Myers T, et al. Expanding the lens of HIV services provision in
34
35 750 Canada: results of a national survey of HIV health professionals. *AIDS Care*
36
37 751 2009;**21**(11):1371-80. doi: 916267339 [pii] 10.1080/09540120902883101 [published
38
39 752 Online First: 2009/12/22]
- 40
41 753 17. Cobbing S, Hanass-Hancock J, Myezwa H. A home-based rehabilitation intervention for
42
43 754 adults living with HIV: A randomized controlled trial. *Journal of the Association of*
44
45 755 *Nurses in AIDS Care* 2017;**28**(1):105-17.
- 46 756 18. Dr. Peter AIDS Foundation Day Health Program. Day Health Program Vancouver, Canada.
47
48 757 2018 [Available from: [http://www.drpeter.org/dr-peter-centre/programs-and-](http://www.drpeter.org/dr-peter-centre/programs-and-services/day-health-program/day-health-program)
49
50 758 [services/day-health-program/day-health-program](http://www.drpeter.org/dr-peter-centre/programs-and-services/day-health-program/day-health-program) accessed August 19 2018.
- 51 759 19. Gough K, Karapita S. Facing the future together: An innovative response to the urgent
52
53 760 HIV/AIDS crisis in Toronto. *Toronto (ON): Casey House* 2011

- 1
2
3 761 20. O'Brien KK, Wilkins A, Zack E, et al. Developing clinical practice guidelines in HIV
4 762 rehabilitation: process recommendations and guiding principles. *AIDS education and*
5 763 *prevention : official publication of the International Society for AIDS Education*
6 764 2011;**23**(5):457-68. doi: 10.1521/aeap.2011.23.5.457 [published Online First:
7 765 2011/10/21]
- 8
9
10
11 766 21. Solomon P, Salvatori P, Guenter D. An interprofessional problem-based learning course on
12 767 rehabilitation issues in HIV. *Med Teach* 2003;**25**(4):408-13.
- 13
14
15 768 22. Solomon P, O'Brien K, Hard J, et al. An HIV mentorship program for rehabilitation
16 769 professionals: Lessons learned from a pilot initiative. *International Journal of Therapy*
17 770 *and Rehabilitation* 2011;**18**(5):280-89.
- 18
19
20 771 23. Sandelowski M. What's in a name? Qualitative description revisited. *Research in nursing &*
21 772 *health* 2010;**33**(1):77-84.
- 22
23
24 773 24. O'Brien KK, Solomon P, Ibáñez-Carrasco F, et al. Evolution of an International Research
25 774 Collaborative in HIV and Rehabilitation: Community Engaged Process, Outcomes, and
26 775 Recommendations. *Progress in Community Health Partnerships: Research, Education*
27 776 *and Action* Accepted November 2017
- 28
29
30 777 25. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Reserach in*
31 778 *Psychology* 2006;**3**(2):77-101.
- 32
33
34 779 26. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*
35 780 2005;**15**(9):1277-88. doi: 15/9/1277 [pii] 10.1177/1049732305276687 [published Online
36 781 First: 2005/10/06]
- 37
38
39
40 782 27. NVivo qualitative data analysis software. Version 10. [program], 2012.
- 41
42 783 28. Sandelowski M. What's in a name? Qualitative description revisited. *Res Nurs Health*
43 784 2010;**33**(1):77-84. doi: 10.1002/nur.20362 [published Online First: 2009/12/17]
- 44
45 785 29. Strachan PH, Kaasalainen S, Horton A, et al. Managing heart failure in the long-term care
46 786 setting: nurses' experiences in Ontario, Canada. *Nursing research* 2014;**63**(5):357-65.
- 47
48
49 787 30. Raaijmakers LG, Hamers FJ, Martens MK, et al. Perceived facilitators and barriers in
50 788 diabetes care: a qualitative study among health care professionals in the Netherlands.
51 789 *BMC family practice* 2013;**14**(1):114.
- 52
53
54
55
56
57
58
59
60

- 1
2
3 790 31. Boscart VM, Heckman GA, Huson K, et al. Implementation of an interprofessional
4
5 791 communication and collaboration intervention to improve care capacity for heart failure
6
7 792 management in long-term care. *J Interprof Care* 2017;**31**(5):583-92. doi:
8
9 793 10.1080/13561820.2017.1340875
- 10 794 32. Li A, McCabe T, Silverstein E, et al. Community-based exercise in the context of HIV:
11
12 795 factors to consider when developing and implementing community-based exercise
13
14 796 programs for people living with HIV. *Journal of the International Association of*
15
16 797 *Providers of AIDS Care (JIAPAC)* 2017;**16**(3):267-75.
- 17 798 33. Chambers LA, Rueda S, Baker DN, et al. Stigma, HIV and health: a qualitative synthesis.
18
19 799 *BMC public health* 2015;**15**:848. doi: 10.1186/s12889-015-2197-0
- 20 800 34. Solomon P, Guenter D, Salvatori P. Integration of persons with HIV in a problem-based
21
22 801 tutorial: a qualitative study. *Teach Learn Med* 2003;**15**(4):257-61.
- 23
24 802 35. Solomon P, Salbach N, O'Brien KK, et al. Increasing capacity in rehabilitation in the
25
26 803 management of HIV: A case-based email intervention. *Journal of Continuing Education*
27
28 804 *and Professional Development* 2015;**21**(1):1-8.
- 29 805 36. Frakes KA, Brownie S, Davies L, et al. Experiences from an interprofessional student-
30
31 806 assisted chronic disease clinic. *J Interprof Care* 2014;**28**(6):573-5. doi:
32
33 807 10.3109/13561820.2014.917404
- 34 808 37. Iddins BW, Frank JS, Kannar P, et al. Evaluation of Team-Based Care in an Urban Free
35
36 809 Clinic Setting. *Nurs Adm Q* 2015;**39**(3):254-62. doi: 10.1097/NAQ.0000000000000103
- 37
38 810 38. Peytremann-Bridevaux I, Staeger P, Bridevaux PO, et al. Effectiveness of chronic obstructive
39
40 811 pulmonary disease-management programs: systematic review and meta-analysis. *Am J*
41
42 812 *Med* 2008;**121**(5):433-43 e4. doi: 10.1016/j.amjmed.2008.02.009
- 43 813 39. Jones KD, Bennett RM, Ward RL, et al. Description of a half-day interprofessional
44
45 814 fibromyalgia clinic with an evaluation of patient satisfaction. *Am J Phys Med Rehabil*
46
47 815 2011;**90**(10):825-33. doi: 10.1097/PHM.0b013e31821f6ed3
- 48 816 40. Hansen KT, McDonald C, O'Hara S, et al. A formative evaluation of a nurse practitioner-led
49
50 817 interprofessional geriatric outpatient clinic. *J Interprof Care* 2017;**31**(4):546-49. doi:
51
52 818 10.1080/13561820.2017.1303463
- 53 819 41. Torres-Sanchez I, Valenza MC, Cebria IIMDA, et al. Effects of different physical therapy
54
55 820 programs on perceived health status in acute exacerbation of chronic obstructive

- 1
2
3 821 pulmonary disease patients: a randomized clinical trial. *Disabil Rehabil*
4 822 2018;**40**(17):2025-31. doi: 10.1080/09638288.2017.1323236
5
6 823 42. Cade WT. Diabetes-related microvascular and macrovascular diseases in the physical therapy
7 824 setting. *Phys Ther* 2008;**88**(11):1322-35. doi: 10.2522/ptj.20080008
8
9 825 43. Rafiq S, Zia S, Ijaz MJ, et al. Role of Weight-Bearing Exercises in the Treatment of Post-
10 826 Menopausal Osteoporosis. *J Coll Physicians Surg Pak* 2018;**28**(2):122-25. doi:
11 827 10.29271/jcsp.2018.02.122
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For peer review only

COREQ Checklist
 Recommendations for Integrating Physical Therapy into an Interprofessional
 Outpatient Model of Care for People Living with HIV: A Qualitative Study

Domain 1: Research team and reflexivity			Comment
Personal Characteristics			
1.	Interviewer/facilitator	Which author(s) conducted the interview?	See Methods (Page 6)
2.	Credentials	What were the researcher's credentials? <i>E.g. PhD, MD</i>	Credentials are included in the Author's Contributions section (Page 27)
3.	Occupation	What was their occupation at the time of the study?	See Affiliations of the author team (Page 1)
4.	Gender	Was the researcher male or female?	See Authors Contributions (Page 27)
5.	Experience and training	What experience or training did the researchers have?	See Author's contributions (Page 27)
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Relationship was not established prior to the interviews (see Methods - Page 5-6).
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? <i>E.g. personal goals, reason for doing the research</i>	Participants knew that the research team was comprised of a group of MScPT students at the University of Toronto who were advised by faculty at the Department of Physical Therapy. (see Methods - Page 5-6).
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? <i>E.g. bias, assumptions, reasons and interests in the research topic</i>	Participants knew that this research was done by students in partial fulfillment of the requirements for a MScPT degree at the UofT (see Methods Page 5-6 and Authors' Contributions Page 27).
Domain 2: Study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? <i>E.g.</i>	We conducted a descriptive qualitative study (See the first sentence in the Methods -

COREQ Checklist
 Recommendations for Integrating Physical Therapy into an Interprofessional
 Outpatient Model of Care for People Living with HIV: A Qualitative Study

		<i>grounded theory, discourse analysis, ethnography, phenomenology, content analysis</i>	Page 5)
Participant selection			
10.	Sampling	How were participants selected? <i>E.g. purposive, convenience, consecutive, snowball</i>	See Page 5-6 (Methods)
11.	Method of approach	How were participants approached? <i>E.g. face-to-face, telephone, mail, email</i>	See Page 5 (Methods)
12.	Sample size	How many participants were in the study?	25 participants. See the first sentence in the results (Page 7)
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	Of the 12 Health care providers who were approached, and met inclusion criteria, 12 agreed to participate. Of the 14 people living with HIV who were approached and met inclusion criteria, 13 agreed to participate. No participants withdrew from an interview or focus group (see Results – Page 7).
Setting			
14.	Setting of data collection	Where was the data collected? <i>E.g. home, clinic, workplace</i>	Specialty hospital in Toronto (Casey House), or at location of choice of health care providers, or via Skype. See Methods (Page 6)
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	For interviews (2 members of the research team (1 interviewer; 1 field note taker). For focus groups (3 members of the research team (1 facilitator; 2 field note takers) See Methods (Page 6)
16.	Description of sample	What are the important	See Table 1 (Page 8) and

COREQ Checklist
 Recommendations for Integrating Physical Therapy into an Interprofessional
 Outpatient Model of Care for People Living with HIV: A Qualitative Study

		characteristics of the sample? <i>E.g. demographic data, date</i>	Results (Page 8)
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	See Methods (Page 6)
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	No (Page 6)
19.	Audio/visual recordings	Did the research use audio or visual recording to collect the data?	Each interview was audio recorded. See Methods (Page 6)
20.	Field notes	Were field notes made during and/or after the interview or focus group?	Field notes were taken throughout the interview. See Methods (Page 6)
21.	Duration	What was the duration of the interviews or focus group?	Approximately 30-90 minutes. See Results (Page 7)
22.	Data saturation	Was data saturation discussed?	Yes. We ceased the interviews at 12 and focus groups at 2 (with 13 participants); which was the point when no new categories emerged. See Discussion (Page 26)
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No (Page 6-7)
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	See Data Analysis (Page 7)
25.	Description of coding tree	Did authors provide a description of the coding tree?	See Data Analysis (Page 7)
26.	Derivation of themes	Were themes identified in advance or derived from the data?	Themes were derived from the data. See Data Analysis (Page 7)

COREQ Checklist
 Recommendations for Integrating Physical Therapy into an Interprofessional
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27.	Software	What software, if applicable, was used to manage the data?	NVivo 10© qualitative software (Page 7)
28.	Participant checking	Did participants provide feedback on the findings?	No. We are in the process of translating the findings back to the community (presentations, etc). (Page 7)
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? <i>E.g. participation number</i>	See Results (Pages 10-23)
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes (Page 10-23)
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Yes. See Results (Page 10-23)
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Yes. See Results (Page 10-23)

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Recommendations for Integrating Physiotherapy into an Interprofessional Outpatient Care Setting for People Living with HIV: A Qualitative Study

Heather deBoer¹, Stephanie Cudd¹, Matthew Andrews¹, Ellie Leung¹, Alana Petrie¹, Soo Chan Carusone², and Kelly K. O'Brien^{1,3,4§}

¹ Department of Physical Therapy, University of Toronto, Toronto, Canada

² Casey House, Toronto, Canada

³ Rehabilitation Sciences Institute (RSI), University of Toronto, Toronto, Canada

⁴ Institute of Health Policy, Management and Evaluation (IHPME), University of Toronto, Canada

§ Corresponding author: Kelly K. O'Brien

Department of Physical Therapy

University of Toronto

160-500 University Avenue

Toronto, Ontario M5G 1V7

Canada

Phone: 1-416-978-0565

Email: kelly.obrien@utoronto.ca

E-mail addresses of authors:

HDB: heather.deboer@mail.utoronto.ca

SC: stephanie.cudd@mail.utoronto.ca

MA: mt.andrews@mail.utoronto.ca

EL: ely.leung@mail.utoronto.ca

AP: alana.petrie@mail.utoronto.ca

SCC: schancarusone@caseyhouse.ca

KKO: kelly.obrien@utoronto.ca

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2
3 **1 ABSTRACT**

4 **2 Objectives:** To identify factors to consider when integrating physiotherapy (PT) into an
5
6
7 3 interprofessional outpatient HIV care setting from the perspective of health care professionals
8
9 4 and adults living with HIV.

10 **5 Design:** We conducted a qualitative descriptive study using semi-structured interviews (health
11
12 6 care professionals) and focus groups (adults living with HIV). We asked participants their
13
14 7 perspectives on barriers, facilitators and strategies to accessing and participating in outpatient
15
16 8 PT, important characteristics physiotherapists should possess working in outpatient HIV care,
17
18 9 content and structure of PT delivery, and program evaluation.

19
20 **10 Recruitment and Setting:** We purposively sampled health care professionals based on their
21
22 11 experiences working in interprofessional HIV care and recruited adults with HIV via word of
23
24 12 mouth and in collaboration with an HIV-specialty hospital in Toronto, Canada. Interviews were
25
26 13 conducted via Skype or in-person and focus groups were conducted in-person at the HIV-
27
28 14 specialty hospital.

29 **15 Participants:** 12 health care professionals with a median of 12 years experience in HIV care,
30
31 16 and 13 adults living with HIV (11 men and 2 women) with a median age of 50 years and living
32
33 17 with a median of 6 concurrent health conditions in addition to HIV.

34 **18 Results:** Overall impressions of PT in outpatient HIV care and factors to consider when
35
36
37 19 implementing PT into an interprofessional care setting include: promoting the role of, and
38
39 20 evidence for incorporating PT into outpatient HIV care, structuring PT delivery to accommodate
40
41 21 the unique needs and priorities of adults living with HIV, working collaboratively with a
42
43 22 physiotherapist on the health care team, and evaluating rehabilitation as a component of
44
45 23 interprofessional care.

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48 **24 Conclusions:** Multiple factors exist for consideration when implementing PT into an
49
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51 25 interprofessional outpatient HIV care setting. Results provide insight for integrating timely and

1
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3 26 appropriate access to evidence-informed rehabilitation for people living with chronic and
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5 27 episodic illness, such as HIV.
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10 29 **STRENGTHS AND LIMITATIONS OF THIS STUDY**
11 30

- 12 31 • To our knowledge, this is the first study to explore the role of and factors to consider
13
14 32 when implementing physiotherapy into an interprofessional outpatient HIV care setting.
15
16 33 • Exploring perspectives from adults living with HIV and health care professionals using
17
18 34 multiple methods of data collection (focus groups and interviews) enabled us to gather
19
20 35 perspectives and recommendations from a diverse stakeholder group involved in
21
22 36 accessing and delivering HIV care to develop recommendations for integrating
23
24 37 physiotherapy into an interprofessional outpatient HIV care setting.
25
26 38 • Health care providers and those involved in program development can use results from
27
28 39 this study when developing or adapting interprofessional outpatient programs for adults
29
30 40 living with HIV and multimorbidity.
31
32 41 • This study was conducted in collaboration with a specialty HIV hospital in an urban
33
34 42 Canadian city and therefore, results may not be transferable to low-to-middle income
35
36 43 countries or rural or remote areas.
37
38 44 • This study specifically focuses on an interprofessional outpatient program for adults
39
40 45 living with HIV; further study is necessary to determine the relevance of results to similar
41
42 46 populations, such as those living with other chronic conditions and multimorbidity.
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49 INTRODUCTION

50 Due to health care advances and improvements in combination antiretroviral therapy, people
51 living with HIV are experiencing increased life expectancy and chronicity of aging and
52 multimorbidity.¹⁻³ Authors of a cross-sectional population-based study in Ontario reported that
53 adults living with HIV experienced increased prevalence of mental and physical medical
54 conditions, and multimorbidity, defined as the presence of several chronic conditions compared
55 to the general population.⁴ Many individuals experience disability associated with HIV and
56 multimorbidity, defined as fluctuations in health, including physical, cognitive, mental or
57 emotional symptoms and impairments, difficulties carrying out day-to-day activities, challenges
58 related to social inclusion and uncertainty about future health.⁵ Rehabilitation, including
59 physiotherapy (PT), has a role in managing and minimizing the spectrum of disability
60 experienced by people living with HIV.⁶ Evidence suggests that PT can help to improve
61 functional mobility,⁷ pain management,⁸ peripheral neuropathy⁹ and address impairments
62 associated with aging among older adults living with HIV and complex comorbidities.^{10,11}
63 Further high level evidence specifically demonstrated the benefits of exercise interventions
64 among adults living with HIV.^{12 13}

65
66 Despite evidence supporting the role and benefits, few people with HIV access PT services.¹⁴
67 Barriers to accessing PT among adults living with HIV include lack of available services, stigma,
68 financial barriers, and lack of knowledge among health care professionals about the role of
69 rehabilitation in HIV care.¹⁵ As HIV transitions from a palliative to chronic illness, novel
70 approaches to PT care delivery may help to overcome barriers accessing PT for people living
71 with complex chronic illness. Authors of a South African study advocated for home- and
72 community-based PT in order to address financial barriers and mobility limitations.¹⁶ Casey
73 House, an HIV specialty hospital in Toronto, opened a publically-funded day health program in
74 2017 with the goal of improving access and coordination of interprofessional health services for
75 people living with HIV.¹⁷ To our knowledge, this is the first to include PT services and offers a
76 foundation for considering rehabilitation as part of an interprofessional team approach in an
77 outpatient HIV care setting. Despite emerging outpatient PT focused programming and services
78 for people living with HIV, to our knowledge no criterion or recommendations exist to guide or

79 considerations for implementing PT as an interprofessional element of outpatient HIV care
80 settings.

81
82 Authors of a qualitative study described the role of PT in addressing physical, psychological and
83 social aspects of health from the perspective of people living with HIV and health professionals
84 with experience in HIV care. Results highlighted the role of PT as multidimensional and client-
85 centered and identified eight contextual factors important to consider in interprofessional HIV
86 care that included: aging, episodic nature of HIV, multimorbidity, competing priorities,
87 continuity of care, stigma, resource security and social isolation.¹⁸ These factors, while complex
88 are important to consider as evidence to inform how to best integrate PT within an
89 interprofessional outpatient HIV care setting. Interprofessional care is well established as a
90 valuable component of coordinated, comprehensive HIV care.¹⁹⁻²¹ However, specific
91 recommendations for how to integrate PT into an interprofessional outpatient HIV program are
92 currently lacking. Hence, the purpose of this study was to identify factors to consider in the
93 integration of physiotherapy (PT) into an interprofessional outpatient HIV care setting from the
94 perspective of health care professionals and people living with HIV.

95 **METHODS**

96 **Study design**

97
98 We conducted a qualitative descriptive study comprised of interviews with health care
99 professionals, and focus groups with adults living with HIV.²² The study protocol was approved
100 by the University of Toronto HIV/AIDS Research Ethics Board (Protocol Reference #33760). In
101 this study, we used the day health program at Casey House, a community-based HIV specialty
102 hospital in Toronto, Ontario, as an exemplar to focus on factors to consider when integrating PT
103 into an interprofessional outpatient setting for adults living with HIV.^{17 18} Casey House provides
104 a continuum of interdisciplinary health care services including inpatient and outpatient (day
105 health program) care and community outreach services for people living with HIV and complex
106 multimorbidity. Services may include but are not limited to, medicine, nursing, social work,
107 mental health and substance use services, recreation therapy, massage therapy, and most
108 recently, physiotherapy making this an ideal setting in which to examine the integration of PT
109 into an interprofessional outpatient care setting.²³

110

111 **Patient and Public Involvement**

112 This research evolved from a longstanding community-academic-clinical partnership among
113 people living with HIV, clinicians and researchers who identified key research priorities in HIV
114 and rehabilitation. This study addresses key research priorities established by the *Canada-
115 International HIV and Rehabilitation Research Collaborative (CIHRRC)*, a network of over 90
116 people living with HIV, researchers, clinicians, representatives from community organizations
117 and policy stakeholders who collectively work to advance and translate HIV and rehabilitation
118 research.²⁴ CIHRRC conducted a multi-stakeholder consultation with researchers, PLWH,
119 clinicians and community partners to establish a *Framework of Research Priorities in HIV,
120 Disability and Rehabilitation*.²⁵ This Framework describes six priorities across three content
121 areas: 1) exploring episodic health and disability; 2) effectiveness of rehabilitation interventions
122 and models of service delivery; and 3) advancing patient-reported outcome measures in HIV
123 rehabilitation.²⁵ This research specifically addresses priority #2 examining models of
124 rehabilitation service delivery in the context of HIV.

125

126 We consulted with a community member living with HIV who advised on the development of
127 the data collection tools. Results from this study were translated in the form of a presentation
128 with Casey House staff, and a fact sheet summary summarizing the role of PT in HIV care and
129 providing practical information of how to access PT. The fact sheet was emailed to study
130 participants and more broadly disseminated via an openly accessible link on the CIHRRC
131 website ([http://cihrrc.hivandrehab.ca/docs/Fact-Sheet-Where-How-PT-Fits-DHP-FINAL--Nov-
132 15-17.pdf](http://cihrrc.hivandrehab.ca/docs/Fact-Sheet-Where-How-PT-Fits-DHP-FINAL--Nov-15-17.pdf)).¹⁸ Results from this study informed the integration of PT into the interprofessional
133 outpatient care setting (Casey House day health program) which serves as a foundation for a
134 community-engaged evaluation of the process and outcomes of rehabilitation for people living
135 with HIV and complex multimorbidity.²³

136

137 **Recruitment**

138 Health Care Professionals: We recruited health care professionals who self-identified as experts
139 in HIV care using purposive sampling, whereby authors (KKO, SCC) identified known
140 professionals working in the field. Health care professionals were defined as health providers

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3 141 who are registered or voluntarily designated by a governing body. To ensure we obtained
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5 142 perspectives from a variety of rehabilitation professionals with expertise in interprofessional HIV
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7 143 care across hospital and community settings, we purposively sampled and recruited rehabilitation
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9 144 professionals from Canada and the United Kingdom (UK) via the *Canada-International HIV and*
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11 145 *Rehabilitation Research Collaborative (CIHRRC)*.²⁴

12 146 People Living with HIV: We recruited adults 18 years or older who self-identified as living with
13
14 147 HIV via posters and word of mouth by Casey House clients and staff. Members of the research
15
16 148 team identified themselves to potential participants as students in the Department of Physical
17
18 149 Therapy at the University of Toronto who were advised by advisors throughout the research
19
20 150 (KKO and SCC). A member of the research team obtained written or verbal informed consent
21
22 151 from each participant immediately prior to each interview or focus group.
23

24 153 **Data Collection**

25 154 We developed semi-structured interview (health care professionals) and focus group (adults
26
27 155 living with HIV) guides to explore considerations when integrating PT into interprofessional
28
29 156 outpatient HIV care for adults, using the Casey House day health program as an exemplar. A
30
31 157 community member living with HIV with research expertise provided feedback on drafts of the
32
33 158 interview and focus group discussion guides. Guiding questions were devised to explore
34
35 159 perspectives in the following areas: strategies of how to enable access to an outpatient PT
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37 160 program for people living with HIV, barriers and facilitators to adults living with HIV
38
39 161 participating in an outpatient PT program, characteristics of physiotherapists that are important
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41 162 for working in outpatient HIV care, recommendations for content and structure of PT sessions in
42
43 164 evaluate the PT program in the context of an outpatient, interprofessional HIV care setting. We
44
45 165 met as a research team throughout data collection to discuss overall impressions of the interviews
46
47 166 and focus groups. We revised the interview guide five times and the focus group guide once
48
49 167 during the course of data collection. We adapted the guides to improve clarity of the questions
50
51 168 and expand on specifics related to evolving codes. This ongoing refinement helped to maximize
52
53 169 our ability to elicit participant responses in subsequent interviews and focus groups in order to
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55 170 comprehensively describe factors for consideration when integrating PT in HIV care.¹⁸

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3 172 We conducted and audio-recorded 12 face-to-face or Skype interviews with health care
4 173 professionals and two focus groups at Casey House with adults living with HIV. Two research
5 174 team members were present for each interview, and three were present for each focus group.
6 175 One team member facilitated the interview (MA, SC, HD, AP) or focus group (MA) and others
7 176 assisted with obtaining consent and documenting field notes (MA, SC, HD, EL, AP). We
8 177 collected data either verbally post interview (health care professionals) or via a self-administered
9 178 questionnaire (adults living with HIV) to understand participant demographics, disease
10 179 characteristics and experiences working in HIV care (health care professionals) and experiences
11 180 with PT (adults living with HIV). Interview and focus group audio recordings were transcribed
12 181 verbatim and reviewed for accuracy. Further details on our methodology are published in a
13 182 manuscript that describes the role of physiotherapy from the perspectives of adults living with
14 183 HIV and healthcare professionals working in HIV care.¹⁸
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185 **Data Analysis**

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26
27 186 We initially read the transcripts independently and noted context and first impressions.²⁶ We then
28 187 used a conventional content analytical approach to code transcripts.²⁷ Data were organized using
29 188 NVivo V10 software.²⁸ All members of the team independently read and coded five of the same
30 189 transcripts (three interviews and two focus groups), and met seven times to discuss overall
31 190 impressions, coding, and adaptations to guides for subsequent data collection. We developed a
32 191 draft coding scheme based on the first four team-coded transcripts (two interviews and two focus
33 192 groups) and ensured coding consistency with an additional team-coded interview. Pairs of two
34 193 team members (HDB, MA, SC, EL, AP) independently coded the remaining transcripts and met
35 194 to discuss coding and resolve discrepancies.¹⁸ We identified common responses and terms in
36 195 transcripts, and then grouped related codes into themes to highlight recommendations for
37 196 integrating PT into an interprofessional outpatient HIV care setting. We defined each theme as it
38 197 related to our study objective and organized the themes to clearly describe participant views and
39 198 perspectives.²⁹ We analyzed categorical demographic variables using frequencies and
40 199 percentages and continuous demographic variables using interquartile ranges (IQR).
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203 RESULTS

204 Twenty-five individuals participated in an interview (12 health care professionals) or a focus
 205 group (13 adults living with HIV) between January and May 2017. Nine health care
 206 professionals practiced in Canada and three practiced in the UK. Half were rehabilitation
 207 professionals (3 occupational therapists and 3 physiotherapists) and the others included a nurse,
 208 pharmacist, recreation therapist, social worker, physician and massage therapist. All three
 209 participants from the UK were rehabilitation professionals. Five health care professionals worked
 210 in a specialty hospital, five in a hospital and two in a community health centre or health clinic.
 211 The health care professionals reported a median of 12 (IQR 8,16) years of experience working
 212 with people living with HIV and a median of 9 years (IQR 4, 12) working in a community
 213 setting, defined as care provided to people living with HIV outside of a hospital. Table 1
 214 summarizes the characteristics of the focus group participants living with HIV. The majority of
 215 adults living with HIV were men and self-reported living with a median of six (IQR 3, 13)
 216 concurrent health conditions in addition to HIV. Approximately one third (four) of participants
 217 living with HIV had no access to provincial social assistance or extended health benefits. Nine
 218 were current clients of Casey House and ten reported interest in attending a day health program
 219 for people living with HIV.

221 **Table 1. Participant Characteristics: Adults living with HIV^a**

Characteristic	Number of participants (%)
Gender	
Man	11 (85%)
Woman	2 (15%)
Median Age (years) (IQR) (n=11 responses)	50 (47, 55)
Current marital status (n=10 responses)	
Single	8 (80%)
Widowed	2 (20%)
Currently working or volunteering (n=11 responses)	3 (27%)

Self-reported health (n=11 responses)	
Excellent	2 (18%)
Good	2 (18%)
Fair	5 (45%)
Poor	1 (9%)
Average gross yearly income before tax (n=10 responses)	
Less than \$10,000 CAD	1 (10%)
\$10,000 to less than \$20,000 CAD	3 (30%)
\$20,000 to less than \$30,000 CAD	5 (50%)
\$40,000 to less than \$50,000 CAD	0 (0%)
\$60,000 to less than \$70,000 CAD	1 (1-%)
Extended medical benefits coverage status (n=11 responses)	
No medical insurance benefits other than provincial health care	4 (36%)
Benefits through a provincial social assistance plan	3 (27%)
Extended medical insurance coverage through work	1 (9%)
Other ^b	3 (27%)
Year of HIV diagnosis, median (IQR) (n=11 responses)	1997 (1995, 2002)
Currently taking HIV antiretroviral therapy (n=11 responses)	9 (69%)
Viral load undetectable (<50 copies/mL) (n=11 responses)	7 (64%)
Number of self-reported concurrent health conditions in addition to HIV, median, (IQR) (n=11 responses)	6 (3, 13)
Commonly self-reported concurrent health conditions ^{cd} (n=11 responses)	
Muscle pain	7 (64%)
Dental problems	6 (55%)
HIV wasting syndrome	6 (55%)
Joint pain	6 (55%)
Mental health condition	6 (55%)
Experience with Physiotherapy (n=11 responses)	

Currently seeing a physiotherapist	3 (27%)
Saw a physiotherapist in the past year	6 (54%)
Never saw a physiotherapist	2 (18%)

Commonly reported reasons for seeing physiotherapist^{cd} (n=11 responses)

To address HIV and side effects of treatment	8 (73%)
To address issues related to other health conditions	7 (64%)
To address physical health challenges	6 (55%)
To address challenges carrying out day-to-day activities	6 (55%)
To help get back to leisure or recreational activities	5 (45%)

Legend: IQR: interquartile range; CAD: Canadian dollars;

^a 11 of 13 adults living with HIV completed the demographic questionnaire;

^b other funding included status card (government ID card for which some Indigenous peoples are eligible, and which provides some extended health coverage) and unspecified;

^c reported by ≥ 5 participants;

^d participants were asked to check all concurrent health conditions they were living with in addition to HIV.

We present overall impressions of PT in outpatient HIV care, followed by factors to consider when implementing PT in an interprofessional care setting using the following themes: promoting the role of, and evidence for PT as part of outpatient HIV care; structuring the PT mode of delivery to accommodate the unique needs and priorities of people living with HIV; working collaboratively with a physiotherapist on the health care team; and evaluating rehabilitation as a component of an interprofessional HIV care. We integrated perspectives of both health care professionals with expertise in HIV care and people living with HIV to best represent recommendations for implementing PT as part of interprofessional outpatient HIV care. Given the diversity of professions represented in our sample, to maintain participant anonymity we refer to health care professionals as either ‘rehabilitation professionals’ (physiotherapist or occupational therapist) or ‘other health care professionals’ (social worker, recreational therapist, pharmacist, physician, registered nurse and massage therapy) in order to maintain participant anonymity.

245 Impressions of Physiotherapy in Outpatient HIV Care

246 Participants living with HIV expressed perceived benefits of having access to PT in an
247 outpatient, interprofessional care setting:

248
249 *“When I walk, I’m not quite as strong as I used to be. I need to be careful when I walk.*
250 *Physiotherapy, I think, will open up a whole new avenue for me and give me more*
251 *confidence and actually, walking from A to B.” - Person living with HIV - P7 (man)*

252
253 Another participant described how having quick access to publically-funded PT may be beneficial
254 to those experiencing acute challenges related to self-care, housing or mobility:

255
256 *“I think that might be a good idea, rapid access, someone coming in off the street who is*
257 *HIV positive having a hard time walking, or, you know, not quite taking care of themselves,*
258 *that can see someone fairly quickly, talk to them and maybe, you know, get some kind of*
259 *physiotherapy.” – Person Living with HIV – P1 (man)*

260
261 *“Another effective use of time clinically... could be that ... we’re going out to the homeless*
262 *and we’re giving them [clients living with HIV] mobility aids and then you could get them*
263 *in [to PT] because then they know it’s [the physiotherapy program] free and they can*
264 *access something.” – Rehabilitation professional – P10 (United Kingdom)*

265
266 One participant spoke about his challenges accessing PT in the past, attributed to having to pay out
267 of pocket for services. He described how universal access to PT as part of a publically funded,
268 outpatient day health program could facilitate access to rehabilitation for more complex and
269 marginalized populations with limited income and financial insecurity:

270
271 *“I just didn’t follow it [physiotherapy] through because of the problem with paying and*
272 *getting reimbursed. But if there was something like the day program and I could have*
273 *accessed one appointment every 2 or 3 weeks I would have probably tended to the problem*
274 *[Baker’s cyst in the knee]. The way it was I didn’t do anything about it.” – Person living*
275 *with HIV - P6 (man)*

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5 277 Health care professionals described how an outpatient interprofessional approach to care offered
6
7 278 the potential to “pull in those people who are reluctant to engage elsewhere” and “fill a big gap
8
9 279 in the clinical and psychosocial care of our patients”. One rehabilitation professional discussed
10
11 280 the value of a specialized outpatient form of care in this population:
12

13
14 282 *“Why can't they [people living with HIV] access a musculoskeletal outpatient service or*
15 283 *neuro outpatient service or general sort of physio clinics?... for some people living with*
16 284 *HIV, where their disease is well controlled, they're not having social problems, mental*
17 285 *health problems, that may well be true... but there's a fairly big proportion of people, or*
18 286 *certainly a reasonable community of people living with HIV who have complex care*
19 287 *morbidities and I think it's those people that really need... special services.” -*
20
21
22 288 *Rehabilitation professional - P11 (United Kingdom)*
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26 289

27 290 Health care professionals suggested that an interprofessional approach to care in the outpatient
28
29 291 setting has potential to address gaps in the health care system by incorporating programs and
30
31 292 services, such as PT that are non-existent or are inaccessible to people living with HIV:
32

33 293
34 294 *“Because once you're out the door in our health care system, you're on your own. So the*
35 295 *more guidance we give them [people living with HIV], the more education, the better.*
36 296 *With our patients, a lot of issues come up because of their cognitive impairment, so even*
37 297 *if they're told some things, they need constant reminders about how to take care of*
38 298 *themselves.” - Other health care professional - P3 (Canada)*
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44 300 **Factors to Consider when Implementing Physiotherapy in Outpatient Interprofessional** 45 46 301 **HIV Care**

47
48 302 In order to adequately address the complexity of HIV care in a practical setting, we identified
49
50 303 four themes regarding the implementation of PT into outpatient interprofessional HIV care: 1)
51 304 promoting the role of, and evidence for, PT in an outpatient HIV clinical setting; 2) structuring
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53 305 the PT mode of delivery to accommodate the unique needs and priorities of people living with
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3 306 HIV; 3) working collaboratively with a physiotherapist on the health care team; and 4)
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5 307 evaluating rehabilitation as a component of interprofessional care.
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7 308

8 309 **1) *Promoting the Role of, and Evidence for, Physiotherapy in an Outpatient HIV Clinical***

9
10 310 ***Setting***

11
12 311 *Role of Physiotherapy*

13 312 Participants described the role of PT within outpatient HIV clinical setting as addressing
14
15 313 physical, psychological and social aspects of health within the context of a health promotion and
16
17 314 rehabilitation approach to care. Many participants living with HIV viewed the role of PT as
18
19 315 synonymous with exercise, stating that PT in an outpatient interprofessional care setting would
20
21 316 provide an opportunity to “*get help with exercises*” and engage in “*exercise together [with peers]*
22
23 317 *or go walking together*”. In addition, people living with HIV suggested PT could enhance social
24
25 318 engagement and provide a venue to build the strength and functional ability to “*actually get up*
26
27 319 *and begin to return to going to a theatre*”.

28
29 321 Health care professionals similarly referred to the role of PT within an outpatient
30
31 322 interprofessional service in a physical context such as “*cardiorespiratory, progressive resistance*
32
33 323 *training, neuromotor exercises*” and “*balance... falls prevention*”, as well as psychological and
34
35 324 social aspects including “*motivation, inspiration, structure, meaning*” while using a creative
36
37 325 approach to “*find an activity that actually motivates someone*”. Health care professionals also
38
39 326 viewed physiotherapists as having a role in “*education*” and “*preventative health*” such as “*falls*
40
41 327 *prevention*”, “*secondary complications*” and “*pain*”.

42
43 329 *Promoting Physiotherapy in an Interprofessional Outpatient HIV Care Setting*

44
45 330 Community and hospital-based health professionals noted the importance of information sharing
46
47 331 between HIV clinics in the city and an outpatient service (day health program). They suggested
48
49 332 that it was valuable for physiotherapists to visit clinics and to present at rounds in order to inform
50
51 333 the health care community about the role and evidence in addressing disability and promoting
52
53 334 healthy aging with HIV, and provide practical information about how clients can access services:
54

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2
3 336 “Every HIV clinic actually has some kind of rounds. A good way of promoting is to... offer
4 337 just to do a rounds either what is being offered at [Name of site] or on a topic, on a physio
5 338 related topic so what’s new in treating or what’s new in arthritis and HIV... you get to
6 339 educate somebody but also are plugging the services at the same time.” Other health care
7 340 professional - P6 (Canada)
8
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12 341

13 342 Another health care professional participant, with experience working in an HIV-specific health
14 343 centre, discussed using social media, specifically involving the experiences of clients to raise
15 344 awareness of PT and provide practical information about what PT is, and how services available
16 345 can be accessed in an outpatient clinical setting:
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21 346

22 347 “Always use social media... have a Twitter account, have a Facebook page, have a
23 348 YouTube video of what physiotherapy at [Name of site] is. Those sort of things are
24 349 important because then if you’ve got a really engaging video that has a physiotherapist
25 350 and a service user in it saying this is what physiotherapy is, this is the services we offer,
26 351 this is what happens when you come and then someone giving their personal experience
27 352 of attending, that will make the world of difference.” Rehabilitation professional - P10
28
29
30
31 353 (United Kingdom)
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34 354

35 355 Staffing and Support

36 356 Participants noted the role members of the health care team play in creating a welcoming
37 357 environment. Health care professionals indicated personal traits that would be useful for
38 358 physiotherapists to possess in order to facilitate engagement in PT such as “warmth”,
39 359 “adaptable”, “non-judgemental” and possessing “broad knowledge [of cardiovascular,
40 360 neurological and musculoskeletal physical therapy-related specialties and rehabilitation for
41 361 people living with HIV and marginalized populations]”.

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48 362
49 363 People living with HIV and health care professionals explained the importance of having a
50 364 physiotherapist who has experience in HIV care, and understands the physical, social and
51 365 psychological complexities of living with HIV.
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3 367 *“I saw a physiotherapist, and ... she didn’t understand HIV, which is fine, ...she was like,*
4
5 368 *‘oh I’ve never seen somebody so young be so weak, I usually work with senior citizens’,*
6
7 369 *and just made me really feel like an alien, that it was like, ‘I don’t even want to work with*
8
9 370 *her anymore.’ And so that’s why I’m kind of like, with something with [a specialty*
10
11 371 *hospital] you feel like people already understand HIV, you don’t feel like you have to*
12 372 *give a lesson.” - Person living with HIV - P3 (woman)*
13
14 373

15 374 However, some participants did not feel all PT services offered to people living with HIV needed
16 375 to be HIV-specific or focused in nature. Some suggested partnering with other community health
17 376 and social service-focused programs, which are not HIV-specific to provide additional options
18 377 for adults with HIV to address their episodic disability, not only for issues related to aging, but
19 378 also disability attributed to potential multimorbidity, such mental health or chronic pain:
20
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22
23

24 379
25 380 *“I think it’s important that there is available knowledge on what other services can be*
26 381 *referred to because not everybody wants to come to a HIV specific service. Just because*
27 382 *you’re positive doesn’t mean you have to engage in a positive program.” - Rehabilitation*
28 383 *professional - P10 (United Kingdom)*
29
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34 385 People living with HIV participants suggested involving PT students in an outpatient care setting
35 386 such as the day health program. Integrating PT students offered a cost-effective strategy for
36 387 increasing availability of PT services while promoting opportunities for increasing knowledge
37 388 and awareness about HIV and reducing stigma among future health care professionals.
38
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42 389
43 390 *“It would be cheaper to have students to come as part of their program or schooling... I*
44 391 *think it would help open up the door to, uh, people who are afraid of communicating with*
45 392 *HIV/AIDS... There is still stigma about HIV out there. I can only imagine what it is like,*
46 393 *going to school, thinking ‘oh god, I am going to work with HIV clients, I don’t want to*
47 394 *touch them, that sort of thing. But, get rid of the fear, educate yourself. Education is key-*
48 395 *and this would be part of education.” - Person living with HIV - P1 (man)*
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53 396

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3 397 **2) Structuring the Physiotherapy Mode of Delivery to Accommodate the Unique Needs and**
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5 398 **Priorities of People Living with HIV**

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7 399 Client-Oriented Environment

8 400 Participants emphasized the importance of a “welcoming” environment including “bright and
9 401 cheery colours” to make it “as much of a comfortable experience” as possible. One health care
10 402 professional noted that people with HIV may be more likely to access PT in an outpatient
11
12 403 interprofessional setting knowing that “they can access more than one thing that’s free” in one
13
14 404 location. Participants suggested reminder phone calls can be beneficial in promoting attendance
15 405 for outpatient service appointments amid fluctuating health, various medical appointments and
16
17 406 scheduling:
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22 408 *“I think that [an] appointment reminder is crucial for people like us who are inundated*
23
24 409 *with appointments.” Person living with HIV - P6 (man)*
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26 410
27 411 Group versus Individual Sessions

28
29 412 Both health care professionals and people with HIV expressed the benefits of group PT exercise
30
31 413 and education sessions including peer support, motivation and cognition:
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33 414
34 415 *“Peer-engaged support, you pair people up, ... we get to know each other, and you don’t*
35
36 416 *create dependent links that emerge as you’re doing physio... pair people, encourage*
37
38 417 *people, because then you forget a part of an exercise, and then my... peer remembers the*
39
40 418 *rest of it.” Person living with HIV - P12 (man)*
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42 419
43 420 However, both stakeholder groups also acknowledged the need for individualized PT sessions,
44
45 421 specifically for initial assessments prior to joining a group, to ensure the unique-needs of a given
46
47 422 client are met:
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49 423
50 424 *“One-on-one is really good if the client has really specific goals around walking or safety*
51
52 425 *or improving transfers... Group settings again have potential for group teaching or*
53
54 426 *exercise class and also has that opportunity to bring folks together and feel like a*
55
56 427 *community.” Other health care professional - P5 (Canada)*
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5 429 Structured versus Flexible Approaches to Physiotherapy Care

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7 430 Participants recommended that scheduled PT appointments are important, but that a PT service
8 431 should be flexible in order to facilitate access to people who may experience episodic disability
9 432 and other confounding barriers to attending PT:

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12 433

13 434 *“I think that having flexibility allows for options and allows for choices because living with*
14 435 *HIV you can have one day that’s great and the next is not so great because the condition is*
15 436 *episodic in nature. So it’s an episodic disability just like cancer, lupus, arthritis, MS that*
16 437 *sort of thing. Even with in the day you can be great in the morning by 10 o’clock and then*
17 438 *by 1 o’clock you’re not feeling that great.” Rehabilitation professional - P7 (Canada)*

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24 440 One health care professional described the benefits of a group-based approach offering a flexible
25 441 (drop-in) attendance schedule in his work setting:

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27 442

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29 443 *“We now have open access, which is, we have people attend, return or restart depending*
30 444 *on their own health and disability. So the open accessibility almost enables people to take*
31 445 *a bit more ownership over their health and they can engage in these things a bit more.*
32 446 *They create a little bit more autonomy about what is important for them in a supervised,*
33 447 *safe physiotherapy led environment.” Rehabilitation professional - P10 (United Kingdom)*

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40 449 Client-Oriented Goals and Interventions

41 450 Participants expressed the need to engage in meaningful PT programs that are relevant and
42 451 tailored to clients’ goals, abilities, and preferences within the context of their day-to-day lives.
43 452 One person living with HIV indicated the importance of PT to address functional goals specific
44 453 to the individual in order to have a relevant and meaningful impact on daily living:

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48 454

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50 455 *“It’s different when you’re in a controlled setting like that [clinical], as opposed to*
51 456 *walking the street on your own, so it’s sort of like a clinical versus a day to day therapy.*
52 457 *So even things like walking the sidewalks and learning how to not trip over things or*
53 458 *learning to go up your stairs.” Person living with HIV - P5 (man)*

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5 460 One health care professional with experience working in an HIV outpatient setting emphasized
6
7 461 the importance of an intervention-focused approach tailored specifically to clients' goals:

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10 463 *"When we're addressing what's meaningful and important to the individual that we're*
11 *treating, if they engage with the process and engage with physical therapy or*
12 464 *physiotherapy, we can achieve people's goals and we know that the majority of their*
13 465 *goals are either body image concerns, participation in meaningful tasks, health and*
14 466 *fitness or mobility."* Rehabilitation professional - P10 (United Kingdom)
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17 467

18 468
19
20 469 One participant with HIV noted how participating in PT could allow individuals to feel a sense
21
22 470 of purpose in contributing to community:

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24 471
25 472 *"...they [people living with HIV] get involved in the community and I know that there's*
26 473 *people at this table that are working at the food bank, and the physiotherapy can give*
27 474 *them energy and extra strength and so with the physiotherapy... you are able to give back*
28 475 *to the community and I think that's wonderful."* - Person living with HIV - P12 (man)
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31 476

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33 477 In order to address clients' individual goals and unique presentations, health care professionals
34 478 suggested stratifying interventions. Practically, this could involve *"different groups for people at*
35 479 *different levels"* and a varying *"ratio"* of participants to support staff depending on factors such
36 480 as *"cognitive problems"*, *"comorbidities"*, *"age"*, and *"mood issues"*. One rehabilitation
37
38
39 481 professional participant noted:

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41 482
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43 483 *"We need to make sure that what we're doing is... centred on the individual, so I think*
44 484 *that everybody who you see, you should do a thorough assessment and kind of work out*
45 485 *what their needs are."* Rehabilitation professional – P12 (United Kingdom)
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51 487 One participant living with HIV described his concerns regarding a group-based intervention that
52
53 488 was not tailored to his level of ability:

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3 490 *“If I’m in a group setting and they’re doing something that I find a bit difficult, I [want to*
4 *be] able to go to a one on one and learn how to do it without taking away time from*
5 491 *everyone else and learning for myself so I’m... secure enough in myself to know I can do*
6 492 *the move without toppling over or bothering something.” - Person living with HIV- P2*
7
8 493
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10 494 *(man)*
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12 495

13 496 Promoting Independence

14
15 497 One participant living with HIV identified that it can be *“very hard doing physiotherapy without*
16 498 *[a physiotherapist] in your room, because she’ll come and make sure you exercise”*. Another
17
18 participant suggested how to overcome this challenge:
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20 500

21
22 501 *“The knee exercises you are doing in the studio or in the centre... record it for each*
23 502 *participant so that each participant has their own disc to take home and follow-through*
24 503 *because three days a week. Three days off, four days on. There are your instructions*
25
26 504 *there.” Person living with HIV - P13 (man)*
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31 506 Health professionals described how PT resources and materials should be adapted to maximize
32 507 retention, independence and adherence to PT programs:
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34 508

35
36 509 *“I think that ensuring if you are using any print material that you are using basic*
37 510 *language... Easy to access information. If material is in print, can our clients read it?...*
38
39 511 *Understanding that people might need to have the same session 2 or 3 times to retain that*
40 512 *session.” - Other health care professional - P5 (Canada)*
41
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43 513

44 514 Sensitivity to Practice

45
46 515 People with HIV and health care professionals noted the importance of physiotherapists to adopt
47 516 approaches that are sensitive to the complexities sometimes faced by people with HIV including
48
49 517 the potential episodic nature of HIV, stigma, substance use challenges, and financial insecurity.

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51 518 One participant emphasized the importance of a *“safe space”* to address stigma with HIV.
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3 520 *“I think that one of the key things is that providing physiotherapy in a safe space... which*
4 *is a space which is maybe dedicated and specialized to people living with HIV... I think is*
5 521 *incredibly important for some people. I think some people want the opportunity to know*
6 *that even though they don’t have to talk about HIV, if I want to talk about HIV in the*
7 522 *context of why I’m here, I’m not going to be judged, I’m not going to be stigmatized*
8 523 *against... I’m not going to encounter something negative. Rehabilitation professional –*
9 *P10 (United Kingdom)*
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17 528 Participants reported stigma as a barrier to accessing PT and suggested the first step in mitigating
18 529 stigma is to simply acknowledge its presence. Stigma may be related to various aspects of life,
19 530 including, “*mental health*”, “*homosexuality*”, “*HIV status*” and may come from health
20 531 professionals, family, or internalized stigma. Participants suggested offering group exercise
21 532 classes tailored to individuals who may identify with a certain culture or gender while
22 533 considering sensitivity to PT practice in order reduce the potential for stigma and discrimination:
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29 535 *“Certain cultures, men and women in the same room... partnering up and things like*
30 536 *that... also gender... the trans community as well... so it would be engaging them as*
31 537 *well.” Person living with HIV - P6 (man)*
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36 539 People living with HIV and health care professionals recognized substance use, including
37 540 “*alcohol*” and “*drug use*” specifically, “*cigarettes*”, “*crystal meth*” and “*cocaine*”, as a barrier to
38 541 participation in PT:
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43 543 *“So we try to schedule the appointments... but sometimes they are not [compliant]*
44 544 *because unfortunately the drug use or the alcohol, whatever they are using, the substance*
45 545 *use is a stronger pull. I would say very often if they have true addiction issues, then it can*
46 546 *... interfere very much.” – Rehabilitation Professional – P8 (Canada)*
47
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50 547

51 548 One person with HIV suggested “*a harm reduction framework within the physiotherapy*”
52 549 approach to better address needs of clients. Health care professionals noted concerns regarding
53 550 the associated risk allowing clients who are using substances to participate in PT due to impaired
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3 551 balance, judgement and potentially unstable vitals: *“I certainly didn’t feel safe to bring people in*
4 *[to physiotherapy] who are on substances.”*

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7 553

8 554 **3) Working Collaboratively with a Physiotherapist on the Health care Team**

9
10 555 Team Communication

11 556 Participants recognized the importance of communication to streamline referrals and to discuss
12 progress of clients within the team. One rehabilitation professional who works in an
13 557 interprofessional setting discussed the importance of identifying appropriate referrals to PT:
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15 558

16
17 559

18 560 *“They [clients] need to be identified as requiring physiotherapy...what is the criteria of*
19 *requiring physiotherapy...the triggers for referral, what is the threshold for referral and*
20 *... the appropriate pathway to facilitate engagement and accessibility?” – Rehabilitation*
21 *professional -P10 (United Kingdom)*

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27 565 The health care team should be knowledgeable of the other members on the team and services
28 available to provide client-centered care. Some health care professionals suggested regular
29 566 meetings in which the team can discuss concerns and specific clients who may be attending the
30 program that day.
31 567
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35
36 570 *“I think communication is the biggest thing, so if you can build tools upfront like weekly*
37 *meetings or even daily meetings... focusing on specific pieces of, like clinical issues that*
38 *are coming up then, you’re probably going to have more success in providing patient*
39 *care to people.” - Other health care professional - P4 (Canada)*

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44 575 Some health professionals suggested that PT may have a role in informing other health practices
45 in regard to transfers, pain, physical impairments and mobility for clients. One health care
46 576 professional who worked in an interprofessional setting described how the team can reinforce PT
47 recommendations so that clients can be best supported, using personalized strategies and
48 577 techniques in each environment:
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3 581 *“They [physiotherapists] could inform the work that I do, and... it would probably*
4 *inform what massage therapy does as well and what nursing does, it already informs*
5 582 *what nursing does, but I think more heavily...nursing - our nurses are great at*
6 583 *implementing the recommendations of physio.” - Other health care professional - P2*
7 584 *(Canada)*
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10 585
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12 586

13 587 Interprofessional Group Sessions

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15 588 Some health professionals suggested adopting interprofessional sessions involving a
16 589 physiotherapist and another health professional, while others advised against it. One
17 590 rehabilitation professional commented on the challenge of addressing competing priorities in a
18 591 joint session:
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24 593 *“When we have more than one professional in the clinic room at the time, completely*
25 594 *ineffectual. I did a joint clinic with a dietician, didn't work. There's too many people in*
26 595 *the room, too many factors to consider, too many competing issues for prioritizing what's*
27 596 *important at the time.” - Rehabilitation professional - P10 (United Kingdom)*
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32 598 However, another health professional commented on the potential benefits of interprofessional
33 599 collaboration in a shared group program:
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38 601 *“I would love to see a collaboration between physiotherapy and recreation therapy*
39 602 *around some sort of exercise groups in the future within the day health program. That*
40 603 *would be something that I would- I think would be a really natural pairing and would*
41 604 *work really well.” - Other health care professional - P2 (Canada)*
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46 606 Whether encouraging interprofessional group-based sessions or not, both health care
47 607 professionals and adults living with HIV recognized the importance of identifying common goals
48 608 to facilitate an effective and meaningful PT session.
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3 612 **4) Evaluating Rehabilitation as a Component of Interprofessional Care**
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5 613 Many health care professionals discussed the importance of evaluation to determine the
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7 614 successes and challenges of implementing a new discipline such as PT in an interprofessional,
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9 615 outpatient HIV care setting. The episodic nature of HIV, in addition to the complex physical,
10
11 616 psychological and social domains of health affected, requires a broad approach to program
12
13 617 evaluation. One health professional with many years experience in HIV care reported:
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15 618
16 619 *“It’s very difficult to find a uniform measurement tool to look at objective markers of*
17 620 *success with physical therapy in a heterogeneous population such as ...people with HIV.*
18
19 621 *Which is the problem we face, which is why the subjective tools and... measurements are*
20 622 *important. However, measuring success means measuring change over time and I think*
21
22 623 *that when you are looking at a condition that is episodic... I think it’s important that we*
23
24 624 *look at a range of different things. So I think there needs to be a battery approach.” -*
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26 625 *Rehabilitation professional - P10 (United Kingdom)*
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28 626

29 627 Most health care professionals suggested implementing a variety of evaluation methods, focused
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31 628 on client goals to capture subjective and objective components of evaluation.
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33 629
34 630 *“I think all evaluation needs to consider what the patient goals are, so to be less*
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36 631 *weighted around program goals and maybe being more focused around patient goals that*
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38 632 *might be one way to consider the evaluation.” - Other health care professional - P4*
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40 633 *(Canada)*
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43 635 One participant with HIV suggested evaluating PT as a component of an interprofessional HIV
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45 636 care that should involve “*weekly or monthly check-ins... just a couple of simple questions*” for
46
47 637 people with HIV to answer. Another suggested:
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49 638
50 639 *“Once you start getting clients, like the ones that are seeing the physiotherapist, ask them*
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52 640 *how its working and how they think it is going so you guys could know how everybody is*
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54 641 *doing with it.” – Person living with HIV - P4 (woman)*
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56 642

643 Overall, participants recognized the importance of focusing on the clients' goals and perspectives
644 to effectively and rigorously evaluate rehabilitation (and specifically PT) as a component of
645 interprofessional HIV care.

646

647 **DISCUSSION**

648 To our knowledge this is the first study to explore factors to consider when implementing PT
649 into an outpatient interprofessional HIV care setting. The role of PT in HIV care is
650 multidimensional and client-centered. Our results recommend a goal oriented and client-centred
651 PT approach to care. Our findings align with recommendations outlined in a conceptual
652 framework of rehabilitation for people living with HIV⁶ and highlight the need for rehabilitation
653 in outpatient settings to address prevention and healthy aging concerns such as mobility and
654 social engagement for people with HIV.

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656 Our results indicate the importance of evaluation PT as an interprofessional approach to
657 outpatient HIV care. In the evaluation of a physiotherapist led group outpatient rehabilitation
658 program for people living with HIV in the UK, individualized goal-setting was beneficial, as
659 83% of participants achieved or surpassed their goals.¹¹ Client-centered HIV care should allow
660 for flexibility to accommodate the potential episodic nature of HIV. Participants outlined barriers
661 to accessing and engaging in PT, which stemmed from the chaotic lifestyle some people with
662 HIV experience related to substance use, stigma, financial security, and basic needs (housing and
663 food) in addition to the episodic nature of HIV. Brown and colleagues minimized these barriers
664 by designing a program where participants were not required to attend weekly, but free to attend
665 and restart as able.¹¹ Collectively our findings highlight the evolving role of rehabilitation
666 beyond tertiary care to that of primary and preventative care as a mechanism for health
667 promotion, prevention of multimorbidity, and healthy aging with HIV.

668

669 Results from our study highlight the importance of a physiotherapist working in an outpatient
670 setting to maintain communication with community HIV clinics ensuring health providers know
671 what services are offered and how to refer clients to PT. Chetty and Hanass-Hancock (2016)
672 conceptualized a rehabilitation model of care for people living with HIV in South Africa.³⁰
673 Authors highlighted the importance of communication among multidisciplinary team members

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3 674 and between hospital and community settings in order to optimize rehabilitation and the need for
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5 675 physiotherapists provide ongoing education with team members and clients regarding the role
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7 676 and importance of PT.³⁰ Studies with other chronic disease populations including chronic heart
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9 677 failure and diabetes have shown that lack of interprofessional communication is a barrier to
10
11 678 providing optimal care.^{31 32} Authors of a qualitative descriptive study explored the impact of
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13 679 introducing an initiative to increase interprofessional communication among health care
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15 680 professionals working with patients with heart failure. After introducing strategies to enhance
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17 681 communication, professionals felt they had greater knowledge of heart failure, and felt patients
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19 682 had improved clinical outcomes.³³ While the importance of interprofessional communication
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21 683 within an outpatient service is evident, further research is needed to address how to optimize
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23 684 communication along the health care continuum, particularly with episodic illness where the
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25 685 continuum may not always be predictable, nor linear in nature.

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27 687 With HIV having transitioned from progressively terminal to a chronic and episodic illness, the
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29 688 rehabilitation needs of people now aging with HIV are not only increasing, but also shifting from
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31 689 the traditional inpatient (hospital) setting to the outpatient (day health program or community)
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33 690 setting. However, few people with HIV are accessing formalized PT services citing barriers
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35 691 related to financial constraints, physical barriers, and lack of knowledge and awareness among
36
37 692 members of the health care team about the role for rehabilitation.^{30 34}

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39 694 Participants in this study noted the importance of physiotherapists to connect with non-HIV
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41 695 specific intervention locales such as community-based PT and fitness centres in order to
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43 696 facilitate referrals if clients prefer to seek treatment in a non HIV-specific setting. In a study
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45 697 examining factors to consider when developing a community-based exercise program for people
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47 698 with HIV, some participants with HIV preferred to attend a program which was not HIV
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49 699 specific. Some felt people with HIV had similar physiotherapy priorities as the general
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51 700 population and could attend any program while others stated attending an HIV program meant
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53 701 exposing themselves to the potential stigma associated with HIV disclosure.³⁵ A qualitative
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55 702 synthesis highlighted experiences of stigma within an HIV care setting, including segregation of
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57 703 people with HIV, behaviours of health care professionals related to fears of exposure, and
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59 704 perceived judgement from practitioners.³⁶ Fear of stigma attending a general outpatient clinical

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3 705 setting was evident among some participants in our study who expressed preferences for an HIV-
4 706 specific program due to beliefs that health providers would better understand and be able to
5 707 address their needs. Participants echoed benefits of social support, such as group PT sessions and
6 708 showed potential benefits of mitigating stigma by involving PT students in an HIV-specific
7 709 outpatient service. Education on the role and evidence of physiotherapy in HIV care is critical for
8 710 enhancing awareness among current and emerging health professionals about PT³⁷ and can help
9 711 to mitigate stigma. While our study provides some insight, further research is necessary to
10 712 determine how best to provide accessible care for those experiencing HIV-related stigma.
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19 714 Participants in this study were living with a median of six concurrent health conditions with the
20 715 majority reporting mental health concerns. Participants commented on challenges accessing
21 716 health care services for those who are living with HIV and actively using drugs and alcohol.
22 717 These principles are reflective of specific considerations related to sensitive practice when
23 718 implementing PT assessment and treatment sessions into an outpatient care setting.
24 719 Interprofessional online modules which address some of these topics, demonstrated utility for
25 720 increasing education and awareness of rehabilitation for people living with HIV among
26 721 community organizations, people with HIV, as well as current and future health care
27 722 professionals.^{20 38 39}
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36 724 Limited evidence exists concerning integration of PT into interprofessional outpatient care
37 725 settings for populations with chronic health conditions. While models of care were developed to
38 726 better meet the health care needs of populations living with chronic conditions, specifically in
39 727 underserved areas,^{40 41} few involve PT and few are specific to HIV care. Chetty and colleagues
40 728 (2016) developed a rehabilitation model of care for people living with HIV in South Africa.^{30 42}
41 729 Authors concluded the need for a patient-centred and multidisciplinary approach to care,
42 730 similarly reported by participants in our study. Guiding principles for a rehabilitation model of
43 731 care included effective communication, leadership, collaboration, and education of providers in
44 732 order to successfully implement a model of care across home and community-based care
45 733 settings.³⁰ There is an opportunity for the HIV and rehabilitation sector to learn and apply
46 734 evidence from other illnesses such as chronic obstructive pulmonary disease⁴³ and
47 735 fibromyalgia,⁴⁴ and in older adults living with multimorbidity,⁴⁵ as well as applying principles
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3 736 from models of HIV rehabilitation established in other contexts such as low to middle income
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5 737 countries.^{30 42} As more people age with HIV in combination with other chronic conditions, it
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7 738 will be important to draw from evidence on the effect of PT interventions from other chronic
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9 739 conditions such as chronic obstructive pulmonary disease,⁴⁶ diabetes,⁴⁷ and osteoporosis⁴⁸, and
10 740 apply it to the context of people with HIV in the outpatient care setting.
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12 741
13 742 In this study, we used a newly emerging day health program in Toronto, Canada as an exemplar
14 743 to establish recommendations for integrating PT into an interprofessional outpatient HIV care
15 744 setting. We interviewed a variety of health care professionals from Canada and the UK to gain a
16 745 broad range of perspectives. Although few health professionals had experience with community-
17 746 based HIV care, all had experience working in HIV patient care and as such were capable of
18 747 speaking to the potential role of PT. Our aim was not to achieve saturation, but rather to obtain a
19 748 rich description of perspectives related to HIV PT care. Nevertheless we ceased data collection
20 749 with 25 participants, which we observed as the point when no new categories emerged. As the
21 750 recruitment for people living with HIV was done through an HIV-specialty hospital in Toronto,
22 751 our study population consisted of adults living with a median of six comorbid conditions in
23 752 addition to HIV and many who had accessed PT in the past year. Results may not represent those
24 753 living in rural areas or low to middle income countries who may have distinct barriers to health
25 754 care resources. Nevertheless, the considerations from our study related to the importance of
26 755 client-centred, goal-oriented and interprofessional care is analogous to the guiding principles of a
27 756 rehabilitation model of care for people living with HIV in South Africa.³⁰ Further research is
28 757 necessary to investigate the potential for cost-saving, client-centred interprofessional approaches
29 758 to care which may be relevant across different health systems and settings.
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760 **CONCLUSION**

761 Factors for consideration when implementing PT into an interprofessional outpatient HIV care
762 setting include: promoting the role of, and evidence for involving PT in an outpatient model of
763 care, structuring PT delivery to accommodate the unique needs and priorities of people living
764 with HIV, working collaboratively with a physiotherapist on the health care team and evaluating
765 rehabilitation as a component of interprofessional care. Results may be used by people living
766 with HIV, clinicians (health and rehabilitation professionals), administrators and policy

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3 767 stakeholders to inform the planning and integration of timely and appropriate access to evidence-
4 768 informed rehabilitation into interprofessional care for people living with chronic illness, such as
5 769 HIV.
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771 **AUTHORS' CONTRIBUTIONS**

772 KKO (PhD) and SCC (PhD) designed the study and provided guidance throughout the research
773 process. KKO and SCC possess expertise in qualitative methodology and HIV and exercise
774 research. KKO and SCC supervised HDB, SC, MA, EL and AP (MScPT students) who
775 developed the protocol, collected and analyzed the data, and drafted the manuscript in partial
776 fulfillment of requirements for an MScPT degree at the University of Toronto. HDB, SC, MA,
777 EL and AP (MScPT students) developed skills in qualitative research methodology including
778 attending lectures; completing readings on qualitative research study design; understanding steps
779 of recruitment, data collection and analysis; completing a literature review; developing the
780 research protocol, interview guides, focus group guide and demographic questionnaire; and
781 considering the ethical issues associated with this research. All steps were closely reviewed and
782 guided by KKO and SCC (advisors). All authors read and approved the final manuscript.

783

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6

7 797 **COMPETING INTERESTS**
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9
10 798 The authors have no competing interests to declare.
11

12 799 **ETHICS APPROVAL**
13

14 800 University of Toronto HIV/AIDS Research Ethics Board.
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17 801 **DATA SHARING STATEMENT**
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20 802 The data collected and analyzed during the study are not publicly available in accordance with
21
22 803 our study protocol that was approved by the University of Toronto HIV/AIDS Research Ethics
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24 804 Board. Data may be available on reasonable request by contacting the corresponding author.
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805 **REFERENCES**

- 806 1. Johs NA, Wu K, Tassiopoulos K, et al. Disability among Middle-Aged and Older Persons with
807 HIV Infection. *Clin Infect Dis* 2017;Jul 1;**65**(1):83-91. doi: 10.1093/cid/cix253
- 808 2. Deeks SG, Lewin SR, Havlir DV. The end of AIDS: HIV infection as a chronic disease.
809 *Lancet* 2013;**382**(9903):1525-33. doi: 10.1016/S0140-6736(13)61809-7. Epub 2013 Oct
810 23.
- 811 3. Antiretroviral Therapy Cohort Collaboration. Survival of HIV-positive patients starting
812 antiretroviral therapy between 1996 and 2013: a collaborative analysis of cohort studies.
813 *The lancet. HIV* 2017;**4**(8):e349-e56. doi: 10.1016/S2352-3018(17)30066-8
- 814 4. Kendall CE, Wong J, Taljaard M, et al. A cross-sectional, population-based study measuring
815 comorbidity among people living with HIV in Ontario. *BMC public health*
816 2014;**14**(1):161. doi.org/10.1186/1471-2458-14-161
- 817 5. O'Brien KK, Bayoumi AM, Strike C, et al. Exploring disability from the perspective of adults
818 living with HIV/AIDS: development of a conceptual framework. *Health Qual Life*
819 *Outcomes* 2008;**6**:76. doi: 1477-7525-6-76 [pii] 10.1186/1477-7525-6-76
- 820 6. Worthington C, Myers T, O'Brien K, et al. Rehabilitation in HIV/AIDS: development of an
821 expanded conceptual framework. *AIDS Patient Care STDS* 2005;**19**(4):258-71.
- 822 7. Cobbing S, Hanass-Hancock J, Deane M. Physiotherapy rehabilitation in the context of HIV
823 and disability in KwaZulu-Natal, South Africa. *Disabil Rehabil* 2014;**36**(20):1687-94.
824 doi: 10.3109/09638288.2013.872199
- 825 8. Pullen S. Physical therapy as non-pharmacological chronic pain management of adults living
826 with HIV: self-reported pain scores and analgesic use. *HIV/AIDS (Auckland, NZ)*
827 2017;**9**:177. <https://doi.org/10.2147/HIV.S141903>
- 828 9. Kietrys DM, Galantino ML, Cohen ET, et al. Yoga for Persons Living with HIV-related Distal
829 Sensory Polyneuropathy: A Case Series. *Rehabilitation Oncology* 2018;**36**(2):123-31.
830 <https://doi.org/10.1097/01.REO.0000000000000089>
- 831 10. O'Brien KK, Solomon P, Trentham B, et al. Evidence-informed recommendations for
832 rehabilitation with older adults living with HIV: a knowledge synthesis. *BMJ Open*
833 2014;**4**(5):e004692. doi: 10.1136/bmjopen-2013-004692 [published Online First:
834 2014/05/17]

- 1
2
3 835 11. Brown D, Claffey A, Harding R. Evaluation of a physiotherapy-led group rehabilitation
4 836 intervention for adults living with HIV: referrals, adherence and outcomes. *AIDS care*
5 837 2016;**28**(12):1495-505. doi: 10.1080/09540121.2016.1191611
6
7
8 838 12. O'Brien KK, Tynan A-M, Nixon SA, et al. Effectiveness of aerobic exercise for adults living
9 839 with HIV: systematic review and meta-analysis using the Cochrane Collaboration
10 840 protocol. *BMC infectious diseases* 2016;**16**(1):182. doi: 10.1186/s12879-016-1478-2.
11
12
13 841 13. O'Brien KK, Tynan A-M, Nixon SA, et al. Effectiveness of Progressive Resistive Exercise
14 842 (PRE) in the context of HIV: systematic review and meta-analysis using the Cochrane
15 843 Collaboration protocol. *BMC infectious diseases* 2017;**17**(1):268. doi: 10.1186/s12879-
16 844 017-2342-8
17
18
19 845 14. Worthington C, Myers T, O'Brien K, et al. Rehabilitation professionals and Human
20 846 Immunodeficiency Virus care: results of a national Canadian survey. *Arch Phys Med*
21 847 *Rehabil* 2008;**89**(1):105-13. doi: S0003-9993(07)01661-9 [pii]
22 848 10.1016/j.apmr.2007.10.009 [published Online First: 2008/01/01]
23
24
25 849 15. Worthington C, O'Brien K, Myers T, et al. Expanding the lens of HIV services provision in
26 850 Canada: results of a national survey of HIV health professionals. *AIDS Care*
27 851 2009;**21**(11):1371-80. doi: 916267339 [pii] 10.1080/09540120902883101 [published
28 852 Online First: 2009/12/22]
29
30
31 853 16. Cobbing S, Hanass-Hancock J, Myezwa H. A home-based rehabilitation intervention for
32 854 adults living with HIV: A randomized controlled trial. *Journal of the Association of*
33 855 *Nurses in AIDS Care* 2017;**28**(1):105-17. doi: 10.1016/j.jana.2016.08.008. Epub 2016
34 856 Sep 6.
35
36
37 857 17. Gough K, Karapita S. Facing the future together: An innovative response to the urgent
38 858 HIV/AIDS crisis in Toronto. *Toronto (ON): Casey House* 2011.
39
40
41 859 18. deBoer H, Andrews M, Cudd S, Leung E, Petrie A, Chan Carusone S, et al. Where and how
42 860 does physical therapy fit? Integrating physical therapy into interprofessional HIV care.
43 861 *Disabil Rehabil* 2018:1-10. doi: 10.1080/09638288.2018.1448469
44
45
46 862 19. O'Brien KK, Wilkins A, Zack E, et al. Developing clinical practice guidelines in HIV
47 863 rehabilitation: process recommendations and guiding principles. *AIDS education and*
48 864 *prevention : official publication of the International Society for AIDS Education*
49
50
51
52
53
54
55
56
57
58
59
60

- 1
2
3 865 2011;**23**(5):457-68. doi: 10.1521/aeap.2011.23.5.457 [published Online First:
4 866 2011/10/21]
- 5
6 867 20. Solomon P, Salvatori P, Guenter D. An interprofessional problem-based learning course on
7 868 rehabilitation issues in HIV. *Med Teach* 2003;**25**(4):408-13. doi:
8 869 10.1080/0142159031000137418
- 9
10 870 21. Solomon P, O'Brien K, Hard J, et al. An HIV mentorship program for rehabilitation
11 871 professionals: Lessons learned from a pilot initiative. *International Journal of Therapy*
12 872 *and Rehabilitation* 2011;**18**(5):280-89. doi: 10.12968/ijtr.2011.18.5.280
- 13
14 873 22. Sandelowski M. What's in a name? Qualitative description revisited. *Research in nursing &*
15 874 *health* 2010;**33**(1):77-84. doi: 10.1002/nur.20362
- 16
17 875 23. Casey House. Casey House. Day Health Program. Available at:
18 876 <https://www.caseyhouse.com/how-we-help/day-health-program-services/>; Accessed:
19 877 March 5, 2019.
- 20
21 878 24. O'Brien KK, Solomon P, Ibáñez-Carrasco F, et al. Evolution of an International Research
22 879 Collaborative in HIV and Rehabilitation: Community Engaged Process, Lessons Learned,
23 880 and Recommendations. *Progress in Community Health Partnerships: Research,*
24 881 *Education and Action* 2018;**12**(4):395-408. doi: 10.1353/cpr.2018.0065
- 25
26 882 25. O'Brien KK, Ibanez-Carrasco F, Solomon P, et al. Advancing research and practice in HIV
27 883 and rehabilitation: a framework of research priorities in HIV, disability and rehabilitation.
28 884 *BMC infectious diseases* 2014;**14**(1):3851. doi: 10.1186/s12879-014-0724-8
- 29
30 885 26. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Reserach in*
31 886 *Psychology* 2006;**3**(2):77-101.
- 32
33 887 27. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*
34 888 2005;**15**(9):1277-88. doi: 15/9/1277 [pii] 10.1177/1049732305276687 [published Online
35 889 First: 2005/10/06]
- 36
37 890 28. NVivo qualitative data analysis software. Version 10. [program], 2012.
- 38
39 891 29. Sandelowski M. What's in a name? Qualitative description revisited. *Res Nurs Health*
40 892 2010;**33**(1):77-84. doi: 10.1002/nur.20362 [published Online First: 2009/12/17]
- 41
42 893 30. Chetty V, Hanass-Hancock J. A rehabilitation model as key to comprehensive care in the era
43 894 of HIV as a chronic disease in South Africa. *AIDS Care* 2016;**28** Suppl 1:132-9. doi:
44 895 10.1080/09540121.2016.1146204

- 1
2
3 896 31. Strachan PH, Kaasalainen S, Horton A, et al. Managing heart failure in the long-term care
4 setting: nurses' experiences in Ontario, Canada. *Nursing research* 2014;**63**(5):357-65.
5 897 doi: 10.1097/NNR.0000000000000049
6 898
7
8 899 32. Raaijmakers LG, Hamers FJ, Martens MK, et al. Perceived facilitators and barriers in
9 diabetes care: a qualitative study among health care professionals in the Netherlands.
10 900 *BMC family practice* 2013;**14**(1):114. doi: 10.1186/1471-2296-14-114
11 901
12 902 33. Boscart VM, Heckman GA, Huson K, et al. Implementation of an interprofessional
13 communication and collaboration intervention to improve care capacity for heart failure
14 903 management in long-term care. *J Interprof Care* 2017;**31**(5):583-92. doi:
15 904 10.1080/13561820.2017.1340875
16 905
17 906 34. Chetty V, Hanass-Hancock J, Myezwa H. Expert Consensus on the Rehabilitation
18 Framework Guiding a Model of Care for People Living With HIV in a South African
19 907 Setting. *J Assoc Nurses AIDS Care* 2016;**27**(1):77-88. doi: 10.1016/j.jana.2015.10.003
20 908
21 909 35. Li A, McCabe T, Silverstein E, et al. Community-based exercise in the context of HIV:
22 factors to consider when developing and implementing community-based exercise
23 910 programs for people living with HIV. *Journal of the International Association of*
24 911 *Providers of AIDS Care (JIAPAC)* 2017;**16**(3):267-75. doi: 10.1177/2325957416686836.
25 912 Epub 2017 Jan 11
26 913
27 914 36. Chambers LA, Rueda S, Baker DN, et al. Stigma, HIV and health: a qualitative synthesis.
28 *BMC public health* 2015;**15**:848. doi: 10.1186/s12889-015-2197-0
29 915
30 916 37. Cobbing S, Chetty V, Hanass-Hancock J, et al. Position Paper: The essential role of
31 physiotherapist in providing rehabilitation services to people living with HIV in South
32 917 Africa. *South African Journal of Physiotherapy* 2017;**69**(1):22-25.
33 918 <https://doi.org/10.4102/sajp.v69i1.368>.
34 919
35 920 38. Solomon P, Guenter D, Salvatori P. Integration of persons with HIV in a problem-based
36 921 tutorial: a qualitative study. *Teach Learn Med* 2003;**15**(4):257-61. doi:
37 922 10.1207/S15328015TLM1504_08
38 923
39 924 39. Solomon P, Salbach N, O'Brien KK, et al. Increasing capacity in rehabilitation in the
40 management of HIV: A case-based email intervention. *Journal of Continuing Education*
41 925 *and Professional Development* 2015;**2**(1):1-8. doi:10.7726/jcepd.2015.1001
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

- 1
2
3 926 40. Frakes KA, Brownie S, Davies L, et al. Experiences from an interprofessional student-
4 927 assisted chronic disease clinic. *J Interprof Care* 2014;**28**(6):573-5. doi:
5 928 10.3109/13561820.2014.917404
6
7 929 41. Iddins BW, Frank JS, Kannar P, et al. Evaluation of Team-Based Care in an Urban Free
8 930 Clinic Setting. *Nurs Adm Q* 2015;**39**(3):254-62. doi: 10.1097/NAQ.000000000000103
9
10 931 42. Chetty V, Hanass-Hancock J. The need for a Rehabilitation Model to address the disparities
11 932 of public healthcare for people living with HIV in South Africa. *African journal of*
12 933 *disability* 2015;**4**(1):137. doi: <https://doi.org/10.4102/ajod.v4i1.137>
13
14 934 43. Peytremann-Bridevaux I, Staeger P, Bridevaux PO, et al. Effectiveness of chronic obstructive
15 935 pulmonary disease-management programs: systematic review and meta-analysis. *Am J*
16 936 *Med* 2008;**121**(5):433-43 e4. doi: 10.1016/j.amjmed.2008.02.009
17
18 937 44. Jones KD, Bennett RM, Ward RL, et al. Description of a half-day interprofessional
19 938 fibromyalgia clinic with an evaluation of patient satisfaction. *Am J Phys Med Rehabil*
20 939 2011;**90**(10):825-33. doi: 10.1097/PHM.0b013e31821f6ed3
21
22 940 45. Hansen KT, McDonald C, O'Hara S, et al. A formative evaluation of a nurse practitioner-led
23 941 interprofessional geriatric outpatient clinic. *J Interprof Care* 2017;**31**(4):546-49. doi:
24 942 10.1080/13561820.2017.1303463
25
26 943 46. Torres-Sanchez I, Valenza MC, Cebria I Iranzo MDA, et al. Effects of different physical
27 944 therapy programs on perceived health status in acute exacerbation of chronic obstructive
28 945 pulmonary disease patients: a randomized clinical trial. *Disabil Rehabil*
29 946 2018;**40**(17):2025-31. doi: 10.1080/09638288.2017.1323236
30
31 947 47. Cade WT. Diabetes-related microvascular and macrovascular diseases in the physical therapy
32 948 setting. *Phys Ther* 2008;**88**(11):1322-35. doi: 10.2522/ptj.20080008
33
34 949 48. Rafiq S, Zia S, Ijaz MJ, et al. Role of Weight-Bearing Exercises in the Treatment of Post-
35 950 Menopausal Osteoporosis. *J Coll Physicians Surg Pak* 2018;**28**(2):122-25. doi:
36 951 10.29271/jcpsp.2018.02.122
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COREQ Checklist
 Recommendations for Integrating Physical Therapy into an Interprofessional
 Outpatient Model of Care for People Living with HIV: A Qualitative Study

Domain 1: Research team and reflexivity			Comment
Personal Characteristics			
1.	Interviewer/facilitator	Which author(s) conducted the interview?	See Methods (Page 7)
2.	Credentials	What were the researcher's credentials? <i>E.g. PhD, MD</i>	Credentials are included in the Author's Contributions section (Page 29)
3.	Occupation	What was their occupation at the time of the study?	See Affiliations of the author team (Page 1)
4.	Gender	Was the researcher male or female?	See Authors Contributions (Page 29)
5.	Experience and training	What experience or training did the researchers have?	See Author's Contributions (Page 29)
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Relationship was not established prior to the interviews (see Methods - Page 6).
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? <i>E.g. personal goals, reason for doing the research</i>	Participants knew that the research team was comprised of a group of MScPT students at the University of Toronto who were advised by faculty at the Department of Physical Therapy. (see Methods - Page 6).
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? <i>E.g. bias, assumptions, reasons and interests in the research topic</i>	Participants knew that this research was done by students in partial fulfillment of the requirements for a MScPT degree at the UofT (see Methods Page 6 and Authors' Contributions Page 29).
Domain 2: Study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? <i>E.g.</i>	We conducted a descriptive qualitative study (See the first

COREQ Checklist
 Recommendations for Integrating Physical Therapy into an Interprofessional
 Outpatient Model of Care for People Living with HIV: A Qualitative Study

		<i>grounded theory, discourse analysis, ethnography, phenomenology, content analysis</i>	sentence in the Methods – Page 5)
Participant selection			
10.	Sampling	How were participants selected? <i>E.g. purposive, convenience, consecutive, snowball</i>	See Page 6-7 (Methods)
11.	Method of approach	How were participants approached? <i>E.g. face-to-face, telephone, mail, email</i>	See Page 6-7 (Methods)
12.	Sample size	How many participants were in the study?	25 participants. See the first sentence in the results (Page 9)
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	Of the 12 Health care providers who were approached, and met inclusion criteria, 12 agreed to participate. Of the 14 people living with HIV who were approached and met inclusion criteria, 13 agreed to participate. No participants withdrew from an interview or focus group (see Results – Page 9).
Setting			
14.	Setting of data collection	Where was the data collected? <i>E.g. home, clinic, workplace</i>	Specialty hospital in Toronto (Casey House), or at location of choice of health care providers, or via Skype. See Methods (Page 8)
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	For interviews (2 members of the research team (1 interviewer; 1 field note taker). For focus groups (3 members of the research team (1 facilitator; 2 field note takers) See Methods (Page 8)

COREQ Checklist
**Recommendations for Integrating Physical Therapy into an Interprofessional
 Outpatient Model of Care for People Living with HIV: A Qualitative Study**

16.	Description of sample	What are the important characteristics of the sample? <i>E.g. demographic data, date</i>	See Table 1 (Page 9-10) and Results (Page 9)
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	See Methods (Page 7)
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	No (Page 8)
19.	Audio/visual recordings	Did the research use audio or visual recording to collect the data?	Each interview was audio recorded. See Methods (Page 8)
20.	Field notes	Were field notes made during and/or after the interview or focus group?	Field notes were taken throughout the interview. See Methods (Page 8)
21.	Duration	What was the duration of the interviews or focus group?	Approximately 30-90 minutes. See Results (Page 9)
22.	Data saturation	Was data saturation discussed?	Yes. We ceased the interviews at 12 and focus groups at 2 (with 13 participants); which was the point when no new categories emerged. See Discussion (Page 28)
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	No (Page 8)
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	See Data Analysis (Page 8)
25.	Description of coding tree	Did authors provide a description of the coding tree?	See Data Analysis (Page 8)

COREQ Checklist
 Recommendations for Integrating Physical Therapy into an Interprofessional
 Outpatient Model of Care for People Living with HIV: A Qualitative Study

26.	Derivation of themes	Were themes identified in advance or derived from the data?	Themes were derived from the data. See Data Analysis (Page 8)
27.	Software	What software, if applicable, was used to manage the data?	NVivo 10© qualitative software (Page 8)
28.	Participant checking	Did participants provide feedback on the findings?	No. We translated findings back to the community (presentations, fact sheet). See Patient and Provider Involvement (Page 6)
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? <i>E.g. participation number</i>	See Results (Pages 12-25)
30.	Data and findings consistent	Was there consistency between the data presented and the findings?	Yes (Page 12-25)
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Yes. See Results (Page 12-25)
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Yes. See Results (Page 12-25)