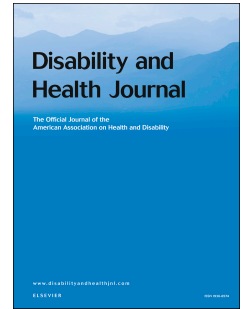# Journal Pre-proof

Patient-Provider Relationships and Long COVID: a Cross-Sectional Survey about Impact on Quality of Life

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Patient-Provider Relationships and Long COVID: a Cross-Sectional Survey about Impact on Quality of Life

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1   Title
2   **Patient-Provider Relationships and Long COVID: a Cross-Sectional Survey about**
3   **Impact on Quality of Life**
4

5   **ABSTRACT**

6

7   **Background**

8   In the United States (U.S.), it is estimated that 17.6% of adults have experienced Long

9   COVID, a condition where symptoms newly develop and linger after initial COVID-19

10   infection. Long COVID is associated with significantly reduced quality of life (QoL), and

11   patient-provider relationships have been shown to influence QoL for patients in general.

12

13   **Objective**

14   The objective for this study was to better understand the role of patient-provider relationships

15   in shaping QoL among U.S. adults with Long COVID.

16

17   **Methods**

18   This study carried out an online survey among U.S. adult with Long COVID (N=792).

19

20   **Results**

21   Respondents with at least a bachelor's degree reported higher QoL, and older respondents were

22   more likely to report lower QoL; trust in providers was a significant predictor of higher QoL,

23   while dismissal of Long COVID symptoms was associated with lower QoL (all p<.05).

24

25   **Conclusions**

26   Healthcare providers should be aware of the importance of trust in the relationship with their

27   Long COVID patients and the impact this may have on patients' QoL. Researchers and

28   policy makers should include an increasing focus on training for providers who treat patients

29   with Long COVID in order to strengthen patient-provider relationships.

30

31   **1. Introduction**

32   As of February 2024, there have been more than 774 million documented cases of

33   COVID-19 worldwide [1]. While many people recover fully from COVID-19, a significant

34   proportion go on to experience lingering or novel symptoms from infection. Post-acute

35   sequelae of SARS-CoV-2 infection (PASC), commonly known as "Long COVID", is an

36   infection associated condition that occurs in individuals with prior SARS CoV-2 infection

37   and that is present for at least three months [1]. More than 200 symptoms, across all organ

38   systems, have been documented [2]. Some of the most common of these are fatigue, cognitive

39   dysfunction, trouble breathing, cough, anxiety, depression, and cardiac symptoms, as well as

40   a range of neurological symptoms [3-5]. These symptoms can last months or even years after

41   onset [6]. While research on the specific mechanisms underlying Long COVID is still

42   underway, immune dysregulation, endothelial abnormalities, autoimmunity, issues with

43 neurological signalling, and dysbiosis are all hypothesized as playing a role [7]. This complex

44 etiology necessitates a multidisciplinary approach for the management of Long COVID

45 symptoms.

46   The burden posed by Long COVID is significant. As of June 2024, it is estimated that

47 18.4% of adults in the United States (U.S.) have experienced Long COVID, with higher

48 prevalence among women, Latino adults, and people with self-reported disabilities [6].

49 Additionally, Black and Latino adults may be affected by Long COVID more severely than

50 White adults [8, 9] which is particularly concerning given the already widely recognized

51 disparities in access to and utilization of health care [10]. Prior research has demonstrated that

52 Long COVID is associated with functional impairment and a significantly reduced quality of

53 life (QoL), with fatigue, in particular, leading to poor QoL [11-15].

54   At present, however, little is known about the role of the patient-provider relationship

55 in shaping QoL among adults with Long COVID. Across a range of health conditions,

56 patient-provider relationships have been shown to influence QoL for patients [16-18]. Trust in

57 providers [17, 19, 20] and perceived respect from providers [18] have both been highlighted as

58 significant among patients facing uncertainty regarding their prognosis and for improving

59 QoL[21]. Trust in providers has also been shown to be an important factor in patients'

60 satisfaction with treatment [19, 22]. The core of such a trusting relationship consists of caring for

61 the patient's interests, competency (avoiding mistakes as well as good interpersonal skills),

62 honesty (telling the truth), and confidentiality [23, 24]. Additional patient-provider relationship

63 factors that have been shown to increase QoL include collaborative decision making and

64 overall satisfaction with care [18, 23].

65   It is critical to determine the role of patient-provider relationships in shaping QoL for

66 patients with Long COVID. The risks of negative ramifications from low trust are notable

67 considering survey data indicating that only 28% of U.S. physicians were somewhat or very

68   confident in treating Long COVID in late 2022 [25]. Further, U.S. adults with Long COVID

69   report struggling to obtain needed care and often having their symptoms dismissed by

70   medical professionals [26]. Even adults seen at specialized Long COVID clinics report

71   providers who are not always fully aware of the newest research on Long COVID [27]. Across

72   both the U.S. and United Kingdom (U.K.), patients have described medical "gaslighting", in

73   which providers disbelieve or dismiss their symptoms [14, 26, 28], which qualitative studies

74   suggest can diminish trust in providers [21]. While the impact of the patient-provider

75   relationship on QoL has not yet been quantitatively explored for Long COVID, qualitative

76   studies suggest that perceived poor quality of care and negative interactions with providers

77   are detrimental to wellbeing, a source of distress and hopelessness, and a contributor to loss

78   of trust in the healthcare system [27, 29, 30]. Providers that fail to take symptoms seriously have

79   also been described as contributing to financial challenges through preventing access to

80   disability benefits [29]. An ideal provider has been characterized as someone who believes in

81   and listens to what patients share with them, acknowledges uncertainty and the seriousness of

82   Long COVID concerns, and actively investigates symptoms [31]. Some scholars suggest that

83   the difficulties in accessing appropriate care for Long COVID reach the threshold for

84   traumatic experience [32], which has also been documented in patients with Chronic Fatigue

85   Syndrome (CFS) [33].

86   This study extends upon these qualitative studies to examine the relationship between

87   QoL and patient-provider relationships while accounting for potential confounders. For

88   example, lower trust in providers among patients with Long COVID may be attributable to

89   the medical "gaslighting" noted above, but it may also reflect preexisting low levels of trust

90   in providers. For example, members of racial and ethnic minorities in general cite lower trust

91   in providers than White individuals [34, 35]. Further, considering the impact of Long COVID on

92   QoL and the lack of readily available proven therapeutic solutions for Long COVID, it is

93   crucial to examine modifiable factors such as patient-provider relationships [36]. A stronger

94   understanding of current patient-provider relationships on QoL can help inform the design of

95   Long COVID interventions and training for providers.[14]. As the World Health Organization

96   has called for initiatives prioritizing the systematic collection of Long COVID information [37],

97   the aim of this study is to assess how patient-provider relationships shape QoL among U.S.

98   adults with Long COVID. Specifically, we hypothesize that (1) trust in providers will be

99   associated with higher QoL in patients with Long COVID, (2) satisfaction with care will be

100   associated with higher QoL in patients with Long COVID; (3) collaborative decision-making

101   will be associated with higher QoL in patients with Long COVID ; (4) the perception of a

102   provider dismissing Long COVID symptoms will be associated with lower QoL in patients

103   with Long COVID; and (5) use of understandable language by a provider will be associated

104   with higher QoL in patients with Long COVID.

105   **2. Methods**

106   **2.1 Sample**

107   Survey firm Qualtrics was used to recruit a sample of 792 English-speaking

108   individuals in the U.S., ages 18-64, from existing research panels in October and November

109   of 2022. Quotas were used to obtain nationally representative samples for gender and

110   race/ethnicity. Eligible participants self-reported having had COVID-19 at least once, were

111   currently experiencing Long COVID symptoms, had health insurance, and had seen a

112   healthcare provider for their Long COVID symptoms at least once. All participants indicated

113   that they met the above-mentioned inclusion criteria. Identifying information was not

114   collected. The study was approved by the Institutional Review Board at [blinded for review],

115   a large public research university.

116   **2.2 Measures**

117   **Screening for COVID-19 Infection History and Long COVID Status.** COVID-19

118   infection history was assessed by one question, "To your best knowledge, have you ever had

119   COVID-19?" with answer options, "Yes" "No" and "Not sure." This variable was then

120   dichotomized as "infected/not infected," with "Yes" answers assigned to "Infected" and

121   "No/Not sure" to "Not infected". Long COVID status was assessed by the following

122   questions, all of which had to be answered affirmatively to be screened into the study: "Do

123   you believe you have Long COVID?", "Do you currently have symptoms associated with

124   Long COVID?", "Are you covered by health insurance?", and "Have you seen a healthcare

125   provider (HCP: physician, nurse practitioner, physician assistant, or other healthcare

126   provider) specifically for your Long COVID symptoms?"

127   **Demographics.** Variables included age, sex, race/ethnicity, education, and marital

128   status.

129   **Number of Symptoms.** Number of symptoms was measured by asking respondents

130   about the presence or absence of 15 specific symptoms (related to breathing, pain, circulation,

131   fatigue, brain fog, movement, sleep, ear/nose/throat, digestive system, muscles/joints, mental

132   health, skin/hair, eyes, reproductive health, and other). Participants were instructed to mark

133   all symptoms that they were currently experiencing.

134   **Trust in Healthcare Providers.** Patient-provider experiences were measured using

135   the Wake Forest Physician Trust Scale [23], using ten items (e.g., "My HCP is extremely

136   thorough and careful", "Sometimes my HCP does not pay full attention to what I am trying to

137   tell them (note: reverse coded)", and "My HCP will do whatever it takes to get me all the care

138   I need." Response options included a five item Likert scale ranging from "strongly disagree"

139   to "strongly agree".

140   **Provider Experiences.** In addition to trust, three provider–patient relationship items

141   related to provider experiences were assessed, including: (i) satisfaction with care ("I was

142   satisfied with the level of care I received from my HCP for my Long COVID symptoms"),

143   (ii) respect ("My HCP was dismissive of my Long COVID symptoms", reverse coded; "My

144   HCP explained Long COVID in language I could understand") and (iii) collaborative

145   decision-making ("My HCP helped me create a plan of action to address my Long COVID

146   symptoms"). All four questions used a five item Likert response scale ranging from "strongly

147   disagree" to "strongly agree".

148   **Type of Provider.** Type of provider seen was measured by one dichotomous question

149   asking participants what type of healthcare provider (HCP) manages most of their health care

150   related to Long COVID. Response options were "Primary Care Provider (e.g., primary care

151   physician, nurse practitioner, physician assistant)" and "Specialist (e.g., cardiologist,

152   pulmonologist, etc.)".

153   **Quality of Life (QoL).** QoL was assessed using the 26-item WHOQoL-BREF, an

154   abbreviated version of the 100-item WHOQoL scale [38]. The WHOQoL-BREF consists of

155   four health domains: physical (e.g., related to pain, medical treatment, sleep quality);

156   psychological (e.g., related to ability to concentrate, satisfaction with self, depression); social

157   (e.g., related to relationships and support from others); and environment (e.g., related to safe

158   environment, finances, information availability, and access to health services). Thus, the

159   WHOQoL is well suited to measure QoL among individuals with Long COVID since Long

160   COVID symptoms can impact almost all aspects of life and daily activities [39-41]. Each domain

161   is comprised of multiple questions that are used to calculate a composite score for each

162   domain. In addition to the four domains, the WHOQoL-BREF includes two stand-alone

163   questions to assess perceived overall QoL and perceived satisfaction with health [38]. Table 1

164   presents all items for the four domains.

165   **2.3 Statistical Analyses**

166   Following descriptive analyses, six hierarchical multiple regression analysis were

167   performed to evaluate which variables were associated with overall QoL, self-reported health,

168   and four domains of QoL (physical, psychological, social, and environment). Demographic

169   variables (including symptom count) were entered in Block 1, provider type was entered in

170   Block 2, and trust in providers as well as provider experiences were entered in Block 3. The

171   effects of the independent variables were expressed in terms of standardized regression

172   coefficients (betas). The amount of variance explained in the model was reported in terms of

173   R^2. All analyses were conducted using SPSS 29.0. Note: No missing data were present in the

174   dataset.

175   **3. Results**

176   **Sample Characteristics.** Of the 2,503 potential participants approached for the study,

177   792 proceeded to the study after the initial screening questions. Respondents were on average

178   38.7 years old (SD=9.3), 49.6% were female and 50.4% were male (the option of other

179   sex/nonbinary was given but not selected by any of the respondents), and 54.9% had a

180   bachelor's degree or higher. The majority of respondents were White (63.8%), 36.2% were of

181   a racial and ethnic minority, and 75.6% of respondents were married or living together with a

182   partner. The average score for QoL was 3.6 out of a five-point Likert scale (SD=0.86). The

183   average number of symptoms per participant was 11.1 (SD=2.1). Additional descriptives of

184   the sample are listed in Table 2.

185   **Bivariate Results.** On the bivariate level, t-tests indicated that White respondents

186   (compared to non-White), and female respondents (compared to male respondents) were

187   significantly more likely to report lower QoL overall, physical QoL, psychological QoL, social

188   QoL, and environmental QoL (all $p<.001$). T-tests also indicated that those with a bachelor's

189   degree or higher and those who were married or living together were more likely to report higher

190   QoL overall, physical QoL, psychological QoL, social QoL, and environmental QoL than their

191   counterparts (all p<.001) (results not shown in a table).

192   **Multivariate Results**. To investigate predictors of QoL, six hierarchical multiple

193   regressions (overall QoL, satisfaction with health, and physical, psychological, social, and

194   environmental QoL) were carried out (Tables 3-4). For Step 1 in each model, demographic

195   variables were entered as predictors. Every Step 1 was statistically significant (p<.001) and

196   explained between 9.9-21.1% of the variance in the QoL indices. For Step 2, provider type

197   was added as a predictor. Again, each model was statistically significant (p<.001) and

198   explained between 9.6-21.8% of the variance in the QoL indices. For the third and final step,

199   trust in providers and provider visit experience variables were added as predictors to the

200   analysis. Each model was statistically significant (p<.001) and explained between 18.5-

201   30.0% of the variance in the QoL indices. The R^2 values and standardized beta-weights for

202   each model and step appear in Tables 3-4.

203   Across all six final (third) models, respondents with at least a bachelor's degree reported

204   higher QoL (both p<.001), higher satisfaction with health (both p<.001), and higher physical

205   (p=.009 and p<.001, respectively), psychological (both p<.001), social (both p<.001), and

206   environmental (both p<.001) QoL. The education standardized betas were consistently one of the

207   largest for every QoL model, reaching medium- or large-sized effects. Across five final (third)

208   steps, older respondents reported lower QoL (p<.001), lower satisfaction with health (p<.001),

209   and lower physical (p<.001), social (p<.001), and environmental (p=.010) QoL. In addition, a

210   higher symptom count was predictive of lower physical, psychological, social, and environmental

211   QoL (all p<.001); White respondents reported lower psychological (p=.037), social (p=.003), and

212   environmental (p=.039) QoL. Gender was only a significant predictor for social QoL with

213   women reporting lower social QoL compared to men (p=.021). Marital status was also only a

214   significant predictor for social QoL with respondents who were married or living together

215   reporting higher social QoL compared to those who were single (p<.001).

216   Respondents with a specialist as their healthcare provider in contrast to a primary care

217   provider reported higher satisfaction with health (p=.009) and higher physical QoL (p=.029).

218   Higher trust in providers was predictive of higher physical (p=.036), psychological (p<.001),

219   social (p=.001), and environmental (p<.001) QoL.

220   Finally, across all six models, being satisfied with the level of care they received for their

221   Long COVID symptoms was predictive of a higher QoL (all p<.001). The satisfaction with care

222   standardized betas were often the second largest for every QoL model, reaching small- or

223   medium-sized effects. A provider dismissing Long COVID symptoms was predictive of lower

224   QoL (QoL: p=.010; Health satisfaction: p=.009; Physical QoL: p=.036; Psychological, social, and

225   environmental QoL: all p<.001) (for complete results, see Tables 3-4).

4. Discussion

227   In this study, we examined the factors associated with QoL among U.S. adults with

228   Long COVID, with a focus on the role of patient-provider relationships. Hypothesis one

229   stated that trust in providers will be associated with higher QoL. Consistent with prior

230   literature on other health conditions [16, 18, 20], this hypothesis was supported, holding true for

231   all QoL domains. This emphasizes the value of building a trusting relationship for both

232   patients and providers, as well the importance of exploring the factors that increase trust in

233   providers for conditions such as Long COVID where a standardized approach to diagnosis

234   and treatment has yet to be defined. As indicated in the Wake Forest Physician Trust Scale [23],

235   however, trust spans beyond providers simply knowing what treatments are best for a patient,

236   suggesting that trust can be established even for conditions where treatments remain

237   emerging. Prior work on other conditions with poorly understood prognoses indicate honing

238 interpersonal skills, such as validating patients' reported experiences, are crucial for

239 cultivating trust [21].

240   Hypothesis two was also supported: Satisfaction with care received was associated

241 with higher reported QoL, also for each of the six QoL outcomes. This is consistent with the

242 existing literature in a variety of medical specialties as well as a wide range of health issues

243 and illnesses (e.g., coronary artery disease, various types of cancer, stroke, osteoarthritis)[42-48].

244 This confirms the importance of satisfaction with care when considering QoL in these

245 patients.

246   Hypothesis three was not supported: Collaborative decision-making was not

247 predictive of higher QoL in this sample. This is incongruent with prior studies that have

248 shown that for patients with breast cancer, involvement with treatment decisions is associated

249 with higher self-reported QoL [49, 50], which has also been documented in primary care settings,

250 endocrinology, cardiology, among others [51-54]. However, there also is some evidence

251 suggesting higher levels of trust among patients may be associated with less involvement in

252 shared decision-making [55]. This dynamic warrants further study in Long COVID patient-

253 provider relationships.

254   In hypotheses four and five, we anticipated a negative association between dismissing

255 symptoms and QoL and a positive association between using clear language and QoL,

256 respectively. Hypothesis four was supported; the perception of a provider dismissing Long

257 COVID symptoms was associated with lower QoL. Hypothesis five was not supported; clear

258 language use by providers was not predictive of higher QoL. Being dismissive of Long

259 COVID symptoms significantly reduced QoL across all four domains, as well as satisfaction

260 with health. This suggests that the failure of some medical providers to acknowledge patient

261 experiences and concerns, which prior work has suggested is a common experience among

262 adults with Long COVID [14, 26], poses harms to patient wellbeing. While clinical uncertainty

263 has posed a challenge for providers treating patients who have Long COVID symptoms [56],

264 providers can still validate patient experiences and work with them to rule out alternative

265 diagnoses [57]. With patients already struggling with low QoL due to the severity of symptoms

266 such as fatigue [11, 15], it becomes critical to strengthen more readily modifiable factors such as

267 patient-provider relationships. Additional training and educational materials for providers

268 should be a priority in both research and practice.

269   That our hypothesis regarding clear language explanations from providers improving

270 QoL was not supported is interesting for several reasons. Firstly, other studies have shown

271 both that Long COVID patients report collaborative, patient-centered approaches enhance

272 care, and that providers' lack of knowledge of Long COVID is a barrier to access. [58] This

273 suggests that patient-provider communication *is* important in the receipt of Long COVID

274 care, but our findings further imply that the *content* of that communication may be less

275 critical if the patient feels that the provider is actively trying to support them in obtaining

276 care. Secondly, the emergence of terminology for Long COVID was largely driven by those

277 experiencing its symptoms [59-61] and so it is possible that patients were already familiar with

278 the language generally used such that this was not a significant issue.

279   Seeing a primary care provider (PCP) rather than a specialist was related to lower

280 health satisfaction and lower physical QoL. PCPs are often the first point of care for those

281 affected by Long COVID and can provide meaningful support to patients with Long COVID

282 through, for example, listening and validating symptoms, conducting a full examination,

283 making a diagnosis, managing symptoms, and supporting patients in obtaining sick leave and

284 workplace accommodations [62]. In practice, however, PCPs have reported not having

285 sufficient resources and training to meet the needs of patients with Long COVID [62]. As a

286 result, some patients may feel their symptoms are not taken seriously. A recent qualitative

287 study of patients in the U.K. found that patients with Long COVID faced long wait times to

288   be seen by PCPs and often felt dismissed by providers who offered little in the way of

289   concrete advice or support [63]. A lack of guidance on treatment options to relieve symptoms

290   may explain the lower QoL with PCPs regarding physical health and satisfaction with health.

291   Finally, demographics also played a role in QoL. Racial and ethnic minorities

292   reported higher psychological, social, and environmental QoL than did those who identified

293   as White. This finding necessitates further exploration, as prior research suggests that racial

294   and ethnic minorities often experience lower health related QoL than their White counterparts

295   [64]. Differences here may be attributable to use of the WHOQoL-BREF, which considers more

296   domains than many other health related QoL measures. Notably, there was no significant

297   difference between these two groups for physical QoL. Coping strategies may also vary

298   demographically in ways that impact QoL [65]. For example, research conducted during

299   COVID-19 suggests that older Black adults reported greater posttraumatic growth than older

300   White adults, which may be partially attributable to religious coping strategies [66]. Structural

301   factors such as racism and other biases against racial and ethnic minorities may necessitate

302   such coping [67, 68]. Further research is needed to explore both coping strategies and provider

303   experiences across ethno-racial groups. Those who identified as male were also more

304   satisfied with their social QoL than were those who identified as female. This is not

305   unexpected, as women often rate their health and experiences with healthcare lower than

306   men, and women have been shown to fare worse following illness from COVID-19 [69]. Social

307   aspects of QoL may be particularly fraught for women due to gendered pressures to continue

308   meeting family obligations despite experiencing Long COVID symptoms [39]. Further, women

309   may be at particularly high risk of experiencing of medical gaslighting in relation to Long

310   COVID [26, 70], which may complicate their evaluation, treatment, and symptom management

311   [71].

312   Overall, findings bolster arguments about the critical role of patient-provider

313   relationships and satisfaction with care in shaping patient wellbeing. Existing literature

314   suggests that focused and supportive care can help patients manage their changed health

315   status and cope with feeling ashamed of or stigmatized by their condition [72]. Further, as has

316   been posited in other works, such feelings may result in changes to self-concept and self-

317   perception, altering the ways in which an individual identifies the self in relation to the social

318   environment, known as sociolocation [73, 74]. This type of self-identification has been defined as

319   depending upon external interactions, and thus when an individual's capacity to perform

320   accustomed social roles is affected by illness such as Long COVID, other support—such as

321   support from health care providers—can help to reduce distress, shame, and self-

322   stigmatization [75]. Our findings provide further support for the potential relationship between

323   support and positive outcomes.

324   **4.1 Limitations and Future Directions**

325   This study represents an important step towards better understanding the potential

326   impact of patient-provider relationships on QoL in the context of Long COVID. Limitations

327   of this study should be considered when interpreting the results. First, experiencing Long

328   COVID was self-reported. At the time of data collection, the diagnosis of Long COVID was

329   uncommon or inconsistent at best. In addition, this study did not assess the duration of time

330   respondents have experienced Long COVID symptoms. It is possible that some have

331   experienced symptoms for a short period of time while others a long period of time, which

332   may impact QoL. Future studies should control for symptom duration in their analyses, as

333   well as the actual start time of any Long COVID symptoms, especially Long COVID

334   developed after diverse COVID-19 strains.

335   The study results can only be generalized to patients with Long COVID who share the

336   characteristics of the sample studied, which excludes children and young adults under the age

337   of 18, those who do not speak English, and those without health insurance. Future studies

338   should include a more diverse group of respondents in order to gain insight into their

339   experiences with providers and how it affects their reported QoL. Another important

340   limitation is that, primarily because of sample size, we had to combine all respondents from

341   racial and ethnic groups in one category. Again, future studies should endeavor to reach a

342   more diverse sample of respondents.

343   Finally, the data are from a cross-sectional survey and therefore causality cannot be

344   inferred. It may be that patient QoL influences their perceptions of trust in their provider –

345   not the other way around. Future studies are needed to confirm the pathways that influence

346   QoL among Long COVID patients. In addition, this study was limited to participants living in

347   the U.S.; it will be important to compare these results to the experiences of patients with

348   Long COVID in other countries as patient experience and QoL is highly influenced by the

349   patient's social/environmental context as well as healthcare factors, which vary across the

350   globe.

351   **5. Conclusions**

352   This study focused on identifying contributing factors to QoL among patients with

353   Long COVID, with an emphasis on trust in providers and patient-provider experiences. Trust

354   in providers was associated with higher QoL, while providers being dismissive of Long

355   COVID symptoms significantly reduced QoL as well satisfaction with health. Strengthening

356   patient-provider relationships through, for example, updated training for providers who treat

357   patients with Long COVID should be a priority.

358   Healthcare providers should be aware of the importance of trust in the relationship

359   with their patients who have Long COVID, as well as the impact this trust may have on

360   patients' QoL. Further, providers should recognize the importance of validating the

361   experiences of patients rather than allowing clinical uncertainty to result in patients feeling

362   like their symptoms have been dismissed. Given limited comfort levels with diagnosing and

363   treating Long COVID [25], it will also be critical for health system leaders and policymakers to

364   encourage continuing medical education related to Long COVID.

365

366   Notes
367
368   The authors declare that they have no known competing financial interests or personal
369   relationships that could have appeared to influence the work reported in this paper.
370
371   No external funding was provided for this study.
372

373

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Table 2
Sample characteristics (N=792)

Characteristics	% (*n*)
Gender	
Male	50.4% (*n*=399)
Female	49.6% (*n*=393)
Age, years	
Mean, SD	38.7, 9.3
Education	
Less than bachelor's degree	45.1% (*n*=357)
Bachelor's degree or higher	54.9% (*n*=435)
Race/ethnicity	
Racial/ethnic minority	36.3% (*n*=287)
White	63.8% (*n*=505)
Marital status	
Married or living together	75.6% (*n*=599)
Not married or living together	24.4% (*n*=193)
Provider type	
Primary Care Provider, General practice	62.5% (n=495)
Specialist (e.g., cardiologist, pulmonologist)	37.5% (n=297)
Symptom count	
Mean, SD	11.1, 2.1
Trust in providers	
Mean, SD	3.7, .7
Provider experiences	
HCP used language I could understand	3.9, 3.1
HCP dismissed Long COVID symptoms	3.1, 1.2
HCP helped create a plan of action	3.7, 1.0
Satisfied with care	3.8, 1.1

Table 3

Hierarchical multiple linear regression predicting self-reported overall QoL, satisfaction with health, and physical QoL among Long COVID patients

Model	Overall QoL			Satisfaction with Health			Physical QoL		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Variable	Beta	Beta	Beta	Beta	Beta	Beta	Beta	Beta	Beta
Gender: Female (Ref. Male)	.016	.019	.043	-.158*	-.131	-.097	-.078	-.063	-.050
Race: White (Ref: Racial/ethnic minority)	-.053	-.049	-.009	-.002	.036	.087	-.060	-.039	-.007
Education: Bachelor's degree or higher (Ref: Less than bachelor's)	.414*	.410*	.410*	.563*	.530*	.458*	.447*	.428*	.395*
Marital status: Married or living together (Ref: Not married)	.190*	.188*	.122	.125	.109	.023	.065	.056	.009
Age	-.016*	-.016*	-.015*	-.017*	-.016*	-.013*	-.015*	-.015*	-.014*
Symptom count	-.010	-.010	-.010	.001	-.002	-.008	-.049*	-.051*	-.052*
Provider type (Ref: PCP)		.026	-.003		.235*	.192*		.130*	.101*
Trust in provider			.073			.007			.061*
Provider experiences									
HCP used language I could understand			.031			-.069			-.030
HCP dismissed Long COVID symptoms			-.068*			-.083*			-.042*
HCP helped create a plan of action			.027			-.006			-.030
Satisfied with care			.160*			.259*			.166*
Step R-Squared	.114*	.114*	.185*	.123*	.126*	.215*	.211*	.218*	.295*

  * *p*<.05

Table 4

Hierarchical multiple linear regression predicting self-reported psychological, social, and environmental QoL among Long COVID patients

Model	Psychological QoL			Social QoL			Environmental QoL		
	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3	Step 1	Step 2	Step 3
Variable	Beta	Beta	Beta	Beta	Beta	Beta	Beta	Beta	Beta
Gender: Female (Ref. Male)	-.082	-.071	-.054	-.177*	-.176*	-.142*	-.031	-.028	-.009
Race: White (Ref: Racial/ethnic minority)	-.136*	-.123*	-.094*	-.232*	-.230*	-.192*	-.139*	-.135*	-.096*
Education: Bachelor's degree or higher (Ref: Less than bachelor's)	.254*	.243*	.211*	.365*	.364*	.301*	.379*	.375*	.344*
Marital status: Married or living together (Ref: Not married)	.080	.074	.010	.436*	.435*	.330*	.130*	.128*	.059
Age	-.006*	-.006*	-.005*	-.016*	-.017*	-.015*	-.007*	-.006*	-.005*
Symptom count	-.036*	-.036*	-.038*	-.054*	-.054*	-.061*	-.032*	-.033*	-.031*
Provider type (Ref: PCP)		.082	.056		.009	.009		.029	.004
Trust in provider			.203*			.211*			.191*
Provider experiences									
HCP used language I could understand			-.025			-.004			.035
HCP dismissed Long COVID symptoms			-.078*			-.166*			-.085*
HCP helped create a plan of action			.054			.020			-.036
Satisfied with care			.140*			.223*			.132*
Step R-Squared	.096*	.099*	.241*	.179*	.179*	.300*	.127*	.128*	.273*

* *p*<.05

Table 1
WHOQoL-BREF scale items

Domain	Items
Physical	To what extent do you feel that (physical) pain prevents you from doing what you need to do?
	How much do you need any medical treatment to function in your daily life?
	Do you have enough energy for everyday life?
	How well are you able to get around?
	How satisfied are you with your sleep?
	How satisfied are you with your ability to perform your daily living activities?
	How satisfied are you with your capacity for work?
Psychological	How much do you enjoy life?
	To what extent do you feel your life to be meaningful?
	How well are you able to concentrate?
	Are you able to accept your bodily appearance?
	How satisfied are you with yourself?
	How often do you have negative feelings such as feeling blue, despair, anxiety, depression?
Social	How satisfied are you with your personal relationships?
	How satisfied are you with your sex life?
	How satisfied are you with the support you get from your friends?
Environmental	How safe do you feel in your daily life?
	How healthy is your physical environment?
	Do you have enough money to meet your needs?
	How available to you is the information that you need in your day-to-day life?
	To what extent do you have the opportunity for leisure activities?
	How satisfied are you with the conditions of your living space?
	How satisfied are you with your access to health services?
	How satisfied are you with your transport?