

1 **Physicians as teachers and lifelong learners**

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## Physicians as teachers and lifelong learners

### Abstract

**Introduction:** Lifelong learning requires sustained motivation for learning. Employing a motivational theory framework, we investigated the relationships of psychological need satisfaction, clinical teaching involvement, and lifelong learning of physicians at different career stages and in various medical specialties. We also examined the associations of physician lifelong learning with stress, burnout, teaching enjoyment, and life satisfaction, all of which are essential for physician well-being and, ultimately, for the provision of quality patient care.

**Methods:** This was a cross-sectional study. Using survey methodology, quantitative data were collected from 202 practicing physicians in Canada. The questionnaire contained validated scales of physician lifelong learning and psychological need satisfaction, measures of clinical teaching (involvement and enjoyment), stress level, burnout frequency, and life satisfaction. Analysis of covariance and correlational analysis were performed.

**Results:** On average, participants reported moderate to moderately high levels of lifelong learning, psychological need satisfaction, teaching enjoyment, and life satisfaction. Irrespective of career stage and specialty, physicians' psychological need satisfaction and involvement in clinical teaching were significant in relation to lifelong learning. That is, physicians who experienced greater psychological need satisfaction at work and those who were involved in clinical teaching had, on average, higher lifelong learning scores. Physician lifelong learning had significant associations with life satisfaction and teaching enjoyment but not with stress level and burnout frequency.

46 **Discussion:** Fulfilling physicians’ basic psychological needs at work and supporting them  
47 in their teaching roles is likely to enhance physician lifelong learning, and ultimately,  
48 quality of patient care.

49 **Keywords:** lifelong learning; basic psychological needs; clinical teaching

50

## 51 **INTRODUCTION**

52 The proliferation in the volume and complexity of medical information and technologies  
53 poses challenges for physicians to stay current in their practice. In order to provide effective  
54 patient care, physicians need to continuously acquire new knowledge and skills in response  
55 to their patients’ evolving needs. As such, it is important that physicians continue learning  
56 in and from their practice and serve as role models of lifelong learning for others in their  
57 practice (e.g., trainees). In this sense, the medical profession requires practitioners to be  
58 both lifelong learners and leaders in self- and practice improvement.

59         Hojat and colleagues define lifelong learning as “...self-initiated activities and  
60 information-seeking skills that are activated in individuals with a sustained motivation to  
61 learn and the ability to recognize their own learning needs”.<sup>1</sup> Published research indicates  
62 that physician lifelong learning positively impacts physician career satisfaction<sup>2,3</sup> and  
63 professional accomplishments (e.g., receiving professional awards or honours, medical  
64 inventions, publications).<sup>4</sup> Little is known, however, about factors contributing to and  
65 enhancing physician lifelong learning. Given that lifelong learning requires a sustained  
66 motivation to learn, one of the ways to increase our understanding is through a motivational  
67 theory lens.

68 Self-determination theory (SDT),<sup>5-8</sup> an established theory of human motivation, has  
69 been gaining interest in medical education research.<sup>9-11</sup> Self-determination theorists posit  
70 that individuals' optimal development, performance, and well-being result from actions  
71 motivated by intrinsic interests (i.e., autonomous/adaptive motivation) as opposed to  
72 external reinforcements (i.e., controlled/maladaptive motivation). They further posit that  
73 fulfilment of three basic psychological needs – autonomy, competence, and relatedness – is  
74 needed to stimulate autonomous motivation and prevent the increase of controlled  
75 motivation.<sup>5-8</sup> The need for autonomy refers to the experience of being the source of one's  
76 own actions and feeling of choice. The need for competence refers to the experience of  
77 feeling effective and capable of achieving desired outcomes, and as such, striving to  
78 enhance one's skills and attain knowledge. The need for relatedness refers to the experience  
79 of belonging, feeling connected, and valued by others. The three needs are considered  
80 interconnected and equally important, and "lacking autonomy, competence, or relatedness  
81 in any activity or domain of activity has detectable costs for both quality of motivation and  
82 well-being".<sup>8</sup> That is, when basic psychological needs are satisfied in the environment (e.g.,  
83 at work), individuals are more likely to initiate and engage effectively in activities for  
84 personal and professional growth.<sup>5-13</sup> In contrast, unmet basic psychological needs can  
85 undermine individuals' functioning, well-being, and motivation to engage in self-directed  
86 learning (e.g., lifelong learning).<sup>5-13</sup> To date, however, empirical research on motivation,  
87 and specifically on psychological need satisfaction of healthcare professionals in relation to  
88 lifelong learning, has been quite limited within the health professions continuing education  
89 context.

90           While psychological need satisfaction at work is needed to encourage and ongoingly  
91 support physician lifelong learning, involvement in clinical teaching has the potential to  
92 enhance it further.<sup>10</sup> Earlier research has shown that involvement in clinical teaching  
93 increases physicians' enjoyment of patient care and improves the quality of their clinical  
94 practice.<sup>14,15</sup> Furthermore, teaching in clinical settings provides valuable exposure to  
95 medical learners who most often have up-to-date knowledge; as such, teaching offers  
96 intellectual stimulation and opportunities for physicians' own learning in and from their  
97 practice.<sup>16-18</sup> To better prepare and support physicians in their teaching roles, many medical  
98 schools in North America have started to provide formal training in teaching to their  
99 resident physicians and ongoing faculty development.<sup>19,20</sup>

100           This study was designed to investigate the relationships of psychological need  
101 satisfaction, clinical teaching involvement, and lifelong learning of physicians at different  
102 career stages, and in various medical specialties. We also aimed to examine the associations  
103 of physician lifelong learning with stress, burnout, teaching enjoyment, and life satisfaction,  
104 all of which are important for physician well-being and, ultimately, for the provision of  
105 quality patient care.

## 106 **METHODS**

### 107 **Procedure and Ethical Considerations**

108 Data were collected between October 2016 and April 2017 using an online survey targeted  
109 at physicians from all specialties and settings across Canada. The link to the questionnaire  
110 was circulated using institutional/departmental mailing lists and newsletters, word of mouth,  
111 including announcements at regional and national professional events, and online  
112 forums/interest groups. Participation in the study was voluntary and participants had the

113 option not to respond to a question if they did not feel comfortable. Informed consent was  
114 implied by the overt action of completing the electronic questionnaire after reading the  
115 information letter. Ethical approval was obtained from the Institutional Research Ethics  
116 Board (Pro00066510).

## 117 **Participants**

118 A total of 202 physicians participated in the study; 5% of the participants chose not to  
119 answer at least one of the background questions (e.g., gender, age, medical specialty). In the  
120 data, 66% of the participants were female; 48% were 25-39 years old, 38% were 40-54  
121 years old, and 12% were 55 years or older. Almost 40% of the participants had been in  
122 practice more than 10 years. There were 48% FM physicians and 50% of non-FM  
123 physicians (15% in internal medicine and related specialties; 14% in surgery, 6% in  
124 paediatrics, and 15% in other specialties).

## 125 **Measures**

126 The questionnaire included validated scales of physician lifelong learning and  
127 psychological need satisfaction, measures of clinical teaching involvement and enjoyment,  
128 stress level, burnout frequency, and life satisfaction.

### 129 *Lifelong learning*

130 The 14-item Jefferson Scale of Physician Lifelong Learning (JeffSPLL)<sup>4</sup> was used to  
131 measure physician lifelong learning, including learning beliefs, attention to learning  
132 opportunities, self-initiated activities, and information-seeking skills. Sample items are: “I  
133 believe I would fall behind if I stopped learning about new developments in my profession”  
134 and “I regularly make time for self-directed learning, even when I have a busy practice  
135 schedule and other professional and family obligations”. Participants responded to items

136 using a four-point Likert-type scale (1–strongly disagree; 4–strongly agree). The internal  
137 consistency (alpha) of the scale in this study was 0.81. Higher scale scores were indicative  
138 of greater lifelong learning.

#### 139 *Psychological need satisfaction*

140 The 12-item Psychological Need Satisfaction scale<sup>21</sup> was used to assess physicians’  
141 psychological need satisfaction, specifically the needs for autonomy, competence, and  
142 relatedness, in the workplace. Sample items are: “At work, I feel free to execute tasks in my  
143 own way” (autonomy); “I am able to solve problems at work” (competence); and “When I  
144 am with the people from my workplace, I feel understood” (relatedness). Participants  
145 responded to items using a six-point Likert-type scale (1–strongly disagree; 6–strongly  
146 agree). The internal consistency (alpha) of the scale in this study was 0.86. A single  
147 summed score was created to reflect the overall need satisfaction for each physician, with  
148 higher scores being indicative of greater psychological need satisfaction.

#### 149 *Clinical teaching involvement and enjoyment*

150 Participants were asked “Do you do any clinical teaching?” (1–yes; 0–no), and if yes, they  
151 were asked what learners they taught choosing from the following response options:  
152 medical students; residents; other physicians; health professionals (nurses, etc.); patients;  
153 and others. All participants were asked to indicate their level of agreement with the  
154 statement “I enjoy teaching” using a six-point Likert-type scale (1–strongly disagree; 6–  
155 strongly agree).

#### 156 *Stress level*

157 Stress level was measured by asking participants “How would you rate the overall stress  
158 level you have experienced in the past three months?” using the following response options:  
159 0–no stress; 1–low; 2–moderate; 3–high; 4–extremely high stress.

#### 160 *Burnout frequency*

161 Burnout frequency was measured by asking participants “How often do you feel burned out  
162 from your work?” using the following response options: 0–never; 1–a few times a year or  
163 less; 2–once a month or less; 3–a few times a month; 4–once a week; 5–a few times a week;  
164 6–every day.

#### 165 *Life satisfaction*

166 Participants were asked to indicate their level of agreement with the statement “I am  
167 satisfied with my life” using a six-point Likert-type scale (1–strongly disagree; 6–strongly  
168 agree).

#### 169 **Analyses**

170 SPSS 24.0 was used to analyze the data. Descriptive statistics were computed for all  
171 study variables. Medical specialties were grouped into family medicine (FM) and non-FM  
172 specialties, with the latter category comprising internal medicine and related specialties  
173 (e.g., dermatology), paediatrics, surgery, and other specialties (e.g., anaesthesiology,  
174 radiology, psychiatry, pathology). This grouping was guided by the following rationale:  
175 family physicians (FM) are regularly tasked with clinical uncertainty and ambiguity  
176 because problems presenting in their family practice are typically encountered at  
177 undifferentiated stages; in contrast, specialists typically deal with patients in whom some  
178 diagnostic manoeuvres have already been performed by a referring physician. Furthermore,  
179 in Canada, FM physicians deliver healthcare to patients in communities or primary care

180 settings and, thus, tend to spend more time on patient care and less on scholarly activities.  
181 Specialists tend to practice in academic medical centres and, hence, are involved in  
182 scholarly activities to a greater extent.

183 Analysis of covariance was performed to examine differences in physician lifelong  
184 learning based on psychological need satisfaction, clinical teaching involvement, years in  
185 practice, and medical specialty (FM vs. non-FM). Correlational analyses were performed to  
186 examine the associations of physician lifelong learning with stress level, burnout frequency,  
187 teaching enjoyment, and life satisfaction. A p-value <0.05 was considered statistically  
188 significant.

## 189 **RESULTS**

190 As shown in Table 1, on average physicians in this study reported moderate to moderately  
191 high levels of lifelong learning (M=44.78; SD=5.13), psychological need satisfaction  
192 (M=60.38; SD=6.40), teaching enjoyment (M=5.12; SD=0.90), and life satisfaction  
193 (M=5.01; SD=0.88). Participants also reported a moderate level of stress (M=2.51;  
194 SD=0.79) and experiencing burnout a few times a month. Majority of physicians (91%)  
195 indicated that they were involved in clinical teaching, including teaching medical students  
196 (93%), residents (90%), health professionals (e.g., nurses; 46%), patients (40%), and  
197 physicians (38%). Of note, majority of the physicians who were not involved in clinical  
198 teaching were physicians in the early career stage (i.e., the first 10 years in practice  
199 following residency training; 74%).

200 In the analysis of covariance of physician lifelong learning scores, none of the  
201 interaction effects of psychological need satisfaction, years in practice, medical specialty,  
202 and involvement in clinical teaching were determined to be significant; as such, the main

203 effects of these variables were examined next. The main effects of psychological need  
204 satisfaction and involvement in clinical teaching were determined to be significant in  
205 physician lifelong learning ( $p=0.004$  and  $p=0.037$ , respectively). Specifically, physicians  
206 who experienced greater psychological need satisfaction at work and physicians who were  
207 involved in clinical teaching had, on average, higher scores on the lifelong learning scale  
208 than those physicians whose psychological needs were satisfied to a lesser degree in the  
209 workplace and those who were not involved in clinical teaching. The main effects of years  
210 in practice and medical specialty were not statistically significant (both  $p$ -values  $>0.05$ ).  
211 Table 2 shows means (SDs) of physician lifelong learning by years in practice, medical  
212 specialty, and involvement in clinical teaching.

213 Finally, physician lifelong learning was positively and significantly correlated with  
214 life satisfaction ( $r=0.20$ ) and teaching enjoyment ( $r=0.24$ ) (both  $p$ -values  $<0.01$ ). No  
215 significant correlations were found between physician lifelong learning and stress level or  
216 burnout frequency (Table 1).

## 217 **DISCUSSION**

218 In published literature, a ‘lack of motivation’ is reported as one of the main barriers for  
219 healthcare professionals to participate in continuing education or change their behaviour.<sup>22</sup>  
220 Drawing on the self-determination theory of human motivation and specifically, on its  
221 empirically supported construct of basic psychological needs, we found that those  
222 physicians whose basic psychological needs were supported in the workplace reported a  
223 greater orientation toward lifelong learning and engagement in lifelong learning activities.  
224 Furthermore, involvement in clinical teaching was determined to be a positive factor in  
225 physician lifelong learning. We also observed significant positive correlations of physician

226 lifelong learning with life satisfaction and teaching enjoyment. Each of these findings is  
227 elaborated in detail below.

228           Irrespective of career stage and specialty, physicians' psychological need  
229 satisfaction was determined to be significant in physician lifelong learning. In studies with  
230 general populations, support of the basic psychological needs of autonomy, competence,  
231 and relatedness in the workplace has been shown to foster intrinsic motivation and  
232 maximize individuals' functioning and well-being (i.e., people are both happier and more  
233 productive).<sup>8</sup> Due to the increased complexity of patient care, more and more often  
234 physicians work in interdisciplinary healthcare teams that include physicians in various  
235 medical specialties, nurses, and other allied healthcare providers (e.g., pharmacists,  
236 physiotherapists, dieticians, occupational therapists). At the same time, physicians spend  
237 more time on non-face-to-face activities (e.g., letters, medication refills, time-consuming  
238 data entry, attending to inbox-type text alerts) than with patients.<sup>23</sup> Additional research  
239 investigating factors that affect physician autonomy (feeling of choice), competence  
240 (feeling of capability), and relatedness (feeling of belonging) in the workplace is required to  
241 ensure optimum physician engagement in lifelong learning.

242           Next, physicians in this study who were involved in clinical teaching had on average  
243 significantly higher scores on the lifelong learning scale than those who were not involved  
244 in clinical teaching. This finding contributes to the existing literature indicating that  
245 teaching has a positive impact on medical practice, including keeping up-to-date with  
246 medical knowledge, techniques, and guidelines,<sup>18</sup> offering intellectual stimulation,<sup>16,17</sup> and  
247 enhancing physician morale and clinical practice.<sup>24</sup> From a motivational perspective,  
248 teaching also has a potential to evoke feelings of autonomy, competence, as well as

249 relatedness among physicians in different settings, which in turn will motivate them to  
250 engage in lifelong learning activities. To stimulate physicians' intrinsic motivation to teach,  
251 it is important to support autonomy and agency in their teaching roles.<sup>25</sup> Feeling competent  
252 through the provision of constructive feedback on teaching and continuing opportunities for  
253 faculty development have been shown to contribute to the retention and recruitment of  
254 junior clinical teachers.<sup>26</sup> Feeling related to other clinical teachers and colleagues by having  
255 teacher communities<sup>10</sup> and good mentorship<sup>26</sup> can encourage physicians to be more  
256 engaged with educational activities. Most importantly, teaching needs to be explicitly  
257 valued, encouraged, and internalised into the culture of the institution.<sup>10</sup> The majority of the  
258 physicians in this study who were not involved in clinical teaching were physicians in the  
259 early career stage. In general, increased time pressures and workload associated with  
260 teaching in practice settings,<sup>27-29</sup> lack of confidence in teaching,<sup>28,30</sup> and insufficient support  
261 either from practice partners,<sup>31</sup> clinical colleagues and mentors when needing advice or  
262 mentorship<sup>32</sup> are reported barriers for physician involvement in clinical teaching. With  
263 respect to early-career physicians, we speculate that time demands associated with setting  
264 up one's own practice and other concurrent early-career life events such as starting a family  
265 and financial burdens of paying off student debt and/or new home ownership are additional  
266 barriers in engaging in clinical teaching. Future qualitative research employing interviews  
267 and focus groups is needed to explore the complexity of factors influencing early-career  
268 physicians' involvement in clinical teaching.

269           Of note is the finding that physician lifelong learning was positively and  
270 significantly correlated with life satisfaction but not with stress level or burnout frequency.  
271 This finding suggests that physicians' overall life satisfaction, including personal and

272 professional aspects, may play an important role in the initiation of and engagement in  
273 lifelong learning practices. At the same time, engagement in lifelong learning is likely to  
274 enhance life satisfaction. Not surprisingly, however, both stress level and burnout frequency  
275 do appear to be negatively and significantly associated with life satisfaction of practicing  
276 physicians. Further research is needed to understand the complex associations among  
277 physicians' stress, burnout, life satisfaction, and pursuit of lifelong learning.

278         In closing, several limitations of this study must be noted. First, this study used self-  
279 report data, which may pose concerns around social desirability bias. However, participants  
280 tended to respond using the full range of response options on the measures used in this  
281 study, yielding evidence against social desirability bias. In addition, as with all surveys,  
282 there is a potential for participant bias; that is, it is possible that participants who were  
283 particularly engaged in lifelong learning were more likely to participate in the study.  
284 Notwithstanding, the positive relationship observed between physician lifelong learning and  
285 psychological need satisfaction suggests that physicians whose basic psychological needs  
286 are supported to a greater degree in the workplace are more likely to pursue lifelong  
287 learning. Second, due to the anonymous nature of the survey, the geographical distribution  
288 of the participants in this study remains unknown. Similarly, we were not able to obtain the  
289 exact response rate due to the various means used in recruiting participants into the study  
290 (i.e., word of mouth, online forums, announcements at professional events, etc.). As such,  
291 the relationships observed in this study should be interpreted in light of participant  
292 demographics (i.e., 66% of the participants were female and only 12% of the participants  
293 were over 55 years of age). Third, due to low frequencies of specialists, we could not  
294 meaningfully examine differences in physician lifelong learning across various medical

295 specialties. Fourth, physicians are known to be particularly prone to low  
296 response/participation rates<sup>33</sup> and the online survey needed to be brief in order to maximize  
297 the participation rate and completeness of the data. As such, this study employed single  
298 item measures of overall (global) life satisfaction, teaching enjoyment, stress level, and  
299 burnout frequency. Fifth, in this study we focused on clinical teaching involvement (i.e.,  
300 yes/no). Considering the positive significant association between clinical teaching  
301 involvement and physician lifelong learning, future studies should include more  
302 comprehensive measures of clinical teaching such as percent of time spent in teaching.  
303 Finally, although causal relationships cannot be established due to the correlational nature  
304 of the data, it is interesting to consider: Are physicians who are satisfied and content more  
305 likely to become involved in teaching and lifelong learning, or does involvement in  
306 teaching and learning itself provide satisfaction? These dilemmas underscore the need for  
307 future studies using longitudinal designs that can better address causality. However, we  
308 believe that being integrated into supportive and collegial community of teaching and  
309 learning is vital in meeting physicians' basic psychological needs in the workplace. This  
310 study supports the idea that involvement in clinical teaching is beneficial for physician  
311 lifelong learning, and as such, it should be encouraged, supported, and promoted within  
312 institutional culture.

### 313 **Lessons for Practice**

- 314 • Assessing motivational and behavioural constructs within the workplace context is  
315 one means of determining their roles in physician lifelong learning.

- 316 • Our data suggest that, irrespective of physician career stage and specialty,  
317 psychological need satisfaction in the workplace and involvement in clinical  
318 teaching have the potential to enhance physician lifelong learning.
- 319 • Relationships among the three psychological needs (autonomy, competence,  
320 relatedness) and clinical teaching involvement need to be studied further to  
321 determine optimal ways of supporting physicians as teachers and lifelong learners  
322 over the course of their careers.
- 323 • Knowing whether and how involvement in clinical teaching impacts psychological  
324 need satisfaction in the workplace will have important implications for practice and  
325 in fostering physician lifelong learning.

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